

# The Urgency of Criminal Law Policy Reformulation in Addressing Algorithm Based Online Gambling in the Digital Era

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## Abstract

Online gambling has evolved significantly in the digital era, driven by algorithmic technology that enables platforms to operate across jurisdictions while evading conventional legal frameworks. This study examines the urgency of reformulating criminal law policy regarding algorithm based online gambling in Indonesia, where existing regulations primarily Law No. 11 of 2008 on Electronic Information and Transactions (ITE Law) as amended by Law No. 19 of 2016, and Law No. 7 of 1974 on Gambling Control are increasingly inadequate in addressing the sophistication of modern digital gambling platforms. Employing normative legal research through statute, conceptual, and case approaches, this study analyzes the gap between the ideal legal framework (*das sollen*) and implementation realities (*das sein*). The findings indicate that current criminal provisions lack technical specificity regarding algorithmic manipulation, cross border jurisdiction, and digital asset based transactions. Furthermore, law enforcement discretion remains fragmented due to the absence of comprehensive digital gambling legislation. This study argues that Indonesia urgently requires a reformulated criminal law policy that incorporates algorithmic governance principles, strengthened inter agency digital law enforcement coordination, and adaptive penal provisions responsive to technological developments. A specialized Digital Gambling Control Law is recommended to address algorithmic design liability, platform operator responsibility, and consumer protection mechanisms.

**Keywords:** Online Gambling, Algorithm, Criminal Law Policy, Digital Law Reform, ITE Law

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## Introduction

The development of information and communication technology over the past two decades has brought about fundamental structural changes across nearly all aspects of human life, including illegal activities that have increasingly migrated into the digital sphere. Online gambling represents one of the fastest growing phenomena and has emerged as a serious legal concern in many countries, including Indonesia. Unlike conventional gambling, which can be readily identified through physical operations, algorithm based online gambling operates through distributed and encrypted digital infrastructures, often hosted on overseas servers, thereby creating significant challenges for law enforcement agencies in terms of identification, investigation, prosecution, and evidentiary processes [1].

Data from the Indonesian Financial Transaction Reports and Analysis Center (PPATK) indicate that online gambling transactions in Indonesia exceeded IDR 327 trillion throughout 2023, with the number of active participants estimated to surpass 3.2 million individuals [2]. This figure represents a dramatic increase compared to approximately IDR 81 trillion recorded in 2022. Such extraordinary growth is largely attributable to the ease of access provided by mobile applications, the widespread use of digital wallets facilitating anonymous transactions, and the implementation of artificial intelligence driven algorithms designed to manipulate winning probabilities in order to maximize operator profits [3]. These circumstances clearly demonstrate that online gambling is no longer merely a matter of morality; rather, it has evolved into a tangible threat to the national economy, social stability, and the legal sovereignty of the state.

Ironically, although gambling in all its forms constitutes a criminal offense under Articles 303 and 303 bis of the Indonesian Criminal Code (KUHP), as further reinforced by Law Number 7 of 1974 concerning Gambling Control, enforcement efforts against online gambling offenders remain far from optimal. Most enforcement actions undertaken by the Indonesian National Police and the Ministry of Communication and Information Technology have tended to be reactive, responding to reports received rather than conducting proactive technology based monitoring. Law Number 11 of 2008 as amended by Law Number 19 of 2016 concerning Electronic Information and Transactions (ITE Law) indeed prohibits the distribution of gambling related content under Article 27 paragraph (2); however, the provision does not specifically address the evolving technical characteristics of digital gambling algorithms [4].

This situation reflects a significant gap between *das sollen* how the law ought to function and *das sein* the reality of legal practice in the field. Normatively, Indonesia possesses a comprehensive legal framework prohibiting gambling activities. Empirically, however, online gambling platforms continue to operate with relative impunity, largely because existing regulations fail to accommodate the technical dimensions of modern digital gambling [5]. This problem is exacerbated by weak inter agency coordination in digital law enforcement, limited technical expertise among law enforcement personnel in analyzing algorithmic systems, and jurisdictional mechanisms that remain incapable of effectively reaching platform operators located abroad [6].

Previous academic studies have predominantly focused on the formal juridical aspects of existing regulations without adequately exploring the technical dimensions of the algorithms that form the operational foundation of online gambling. Several studies have examined law enforcement against online gambling in general [7], as well as the application of restorative justice in the context of cybercrime [8]. Nevertheless, a substantial analytical gap remains regarding how criminal law frameworks should be reformulated to respond to the specific characteristics of digital gambling algorithms. Research specifically addressing algorithmic design accountability, the criminal liability of platform operators, and consumer protection mechanisms in the context of artificial intelligence based online gambling remains extremely limited within Indonesian legal scholarship [9].

Furthermore, developments in Indonesian criminal law in recent years, particularly the enactment of Law Number 1 of 2023 concerning the New Criminal Code (New KUHP), have

introduced several substantive reforms relevant to gambling eradication. The New Criminal Code regulates gambling offenses more systematically through two complementary provisions: Article 426 and Article 427. Article 426 paragraph (1) imposes criminal sanctions on organizers, bookmakers, and operators of illegal gambling activities, including those who offer or provide gambling opportunities to the public without authorization, carrying a maximum penalty of nine years' imprisonment or a Category VI fine [10]. Meanwhile, Article 427 specifically extends criminal liability to players or participants in illegal gambling activities, stipulating that "any person who takes advantage of an unauthorized gambling opportunity shall be subject to a maximum imprisonment of three years or a Category III fine" [10]. These provisions replace Articles 303 and 303 bis of the former Criminal Code and, in principle, reinforce the position that online gambling conducted without legal authorization may result in criminal liability for both operators and participants.

Nevertheless, Articles 426 and 427 of the New Criminal Code continue to exhibit fundamental limitations when confronted with the realities of algorithm based online gambling. These provisions are formulated through a conventional legal approach that does not explicitly accommodate the technical characteristics of digital gambling platforms, such as artificial intelligence driven algorithmic manipulation, cryptocurrency based transactions, and cross jurisdictional server operations. The provisions contain no specific regulations concerning the liability of algorithm developers, transparency obligations for digital platforms, or effective criminal law based blocking mechanisms. Meanwhile, regulatory developments at the international level continue to advance rapidly. The European Union, for example, has adopted a comprehensive artificial intelligence regulatory framework through the AI Act, which includes extensive provisions concerning algorithmic accountability [11]. The gap between the reforms introduced by the New Criminal Code and the regulatory demands of the digital era underscores that Indonesia requires more than mere statutory amendments; it necessitates a fundamental reformulation of criminal law policy that is adaptive to technological developments.

Based on the foregoing background, there exists a strong academic and practical urgency to systematically and comprehensively examine the reformulation of criminal law policy concerning algorithm based online gambling. This study seeks to address two principal issues. First, how effective is the current criminal law framework in addressing the phenomenon of algorithm based online gambling in Indonesia, and what are its primary weaknesses? Second, how should criminal law policy be reformulated to effectively regulate, prevent, and prosecute algorithm based online gambling in the digital era?

## Literature Review

### 1. Criminal Law Policy Theory (Penal Policy)

Criminal law policy, commonly referred to as penal policy, constitutes an integral component of broader social policy. Marc Ancel, as elaborated by contemporary criminal law scholars, defines criminal policy as both a science and an art aimed at responding rationally to crime through the utilization of criminal law instruments [12]. In this sense, criminal law policy is not merely a technical matter of legislative drafting; rather, it encompasses fundamental value choices and social priorities regarding which acts should be criminalized, how punishment should be implemented, and what objectives should be achieved through the criminal justice system.

Sudarto, one of Indonesia's most influential criminal law scholars, argues that criminal law policy consists of three interrelated dimensions. First, the policy of criminalization (*criminalization policy*), which determines what conduct should be classified as a criminal offense. Second, the policy of legal application (*application policy*), which concerns how criminal norms are enforced by law enforcement authorities. Third, the policy of execution (*execution policy*), which relates to the implementation of criminal sanctions [12]. These three dimensions must operate synergistically for criminal law policy to achieve its intended

objectives. In the context of algorithm based online gambling, deficiencies can be identified across all three dimensions simultaneously: the established legal norms lack specificity, law enforcement remains inconsistent, and the implementation of sanctions is ineffective.

The scholarly contributions of Barda Nawawi Arief, which continue to serve as a major reference in contemporary Indonesian criminal law reform discourse, emphasize that criminal law reform should be pursued through two complementary approaches: penal measures and non penal measures [13]. This perspective is particularly relevant to online gambling, where punitive approaches alone are insufficient without accompanying policies concerning platform regulation, public education, and the enhancement of technical capacities among law enforcement agencies. Nevertheless, penal measures remain an indispensable foundation, particularly given the substantial social harm generated by the digital gambling industry.

From the perspective of modern criminal law, there is an increasingly strong tendency toward what is commonly referred to as *smart regulation*, namely the use of a combination of regulatory instruments including criminal law, administrative law, and civil law to achieve policy objectives more effectively [14]. This approach recognizes the structural limitations of criminal law in addressing highly organized and technologically sophisticated forms of crime. Consequently, the reformulation of criminal law policy concerning online gambling should not be undertaken in a fragmented manner but must instead be integrated within a comprehensive framework of digital regulatory policy. This position is consistent with the continuing evolution of Indonesia's criminal justice system in response to contemporary challenges [15].

Furthermore, in the context of digitalization, criminal law policy faces particular challenges relating to the principle of legality (*nullum crimen sine lege, nulla poena sine lege*). This principle requires that criminalized conduct be clearly and precisely defined by law in order to provide legal certainty for citizens [16]. The difficulty lies in the fact that the technical characteristics of online gambling algorithms evolve rapidly, often outpacing the capacity of legislators to anticipate every new technological development.

Comparative criminal law scholars have proposed solutions through the adoption of *technology neutral drafting* and *outcome based regulation*, whereby legal provisions focus on the consequences or outcomes of conduct rather than the specific technical means employed [17]. Such an approach allows regulations to remain relevant despite continuous technological advancement. In the Indonesian context, this approach may be adapted by formulating criminal provisions that target the operation of digital gambling platforms utilizing algorithmic systems to influence gambling outcomes, without requiring an exhaustive definition of every possible type of algorithm that may be employed.

## 2. Criminal Liability Theory in the Context of Digital Corporations

Criminal liability in the realm of cybercrime, particularly when involving corporate entities or legal persons, constitutes one of the most complex issues in modern criminal law. Traditionally, criminal law has been built upon the principles of *actus reus* and *mens rea* the guilty act and the guilty mind both of which are attributed to individual human actors [18]. However, the realities of digital corporate crime necessitate an expansion of criminal liability concepts to encompass non individual entities operating through digital infrastructures.

In Indonesia, the development of corporate criminal liability has progressed significantly through various special statutes, including anti corruption, anti money laundering, and narcotics laws, all of which explicitly recognize corporations as subjects of criminal law [19]. Nevertheless, within the fields of cybercrime and online gambling, the framework of corporate criminal liability remains insufficiently developed. The Electronic Information and Transactions Law (ITE Law) recognizes corporations as legal subjects but does not adequately regulate mechanisms for imposing criminal sanctions upon digital platform corporations, particularly those domiciled abroad [4].

According to the identification theory, a corporation may be held criminally liable when the offense committed constitutes the act of individuals who represent the corporation's *directing*

*mind and will* [20]. Meanwhile, the doctrine of *respondeat superior* permits corporations to be held liable for the acts of employees performed within the scope of their employment. In the context of algorithm based online gambling platforms, the central question concerns who should bear responsibility for designing algorithms that manipulate winning probabilities. The answer to this question is crucial in determining the appropriate formulation of criminal norms.

Recent developments in digital criminal law have introduced the concept of *algorithmic accountability* as a framework for assigning responsibility within artificial intelligence based systems [21]. This concept recognizes that when algorithms are intentionally designed for manipulative purposes such as covertly controlling winning probabilities within gambling platforms the developers and operators of such platforms possess a legally constructible *mens rea*. This issue is particularly significant because algorithmic manipulation remains largely invisible to users, rendering it both more dangerous and more difficult to prove through conventional evidentiary mechanisms.

Comparative references can be found within European Union regulations, particularly the AI Act (Regulation 2024/1689), which classifies artificial intelligence systems according to risk levels and establishes stringent transparency and accountability obligations for developers and operators of high risk AI systems [11]. Although the regulatory context differs, the principles developed under the European AI framework may provide valuable guidance for the reformulation of Indonesian criminal law regarding algorithmic accountability in online gambling platforms.

The consumer protection dimension cannot be separated from issues of platform operator liability. As highlighted in studies on digital consumer protection in Indonesia [22], users of online gambling platforms frequently occupy a highly vulnerable position due to the lack of transparency surrounding algorithmic mechanisms that determine gambling outcomes. Consequently, the criminal liability of platform operators is not merely a matter of enforcing criminal norms but also serves as an instrument for protecting consumers from algorithmic exploitation.

### **3. The Principle of Legality and Its Challenges in Digital Criminal Law**

The principle of legality constitutes a fundamental pillar of a civilized criminal justice system. Traditionally expressed through the Latin maxim *nullum crimen sine lege, nulla poena sine lege*, the principle encompasses several essential dimensions: *lex scripta* (the law must be written), *lex certa* (the law must be clear and certain), *lex stricta* (the law must be strictly interpreted without analogy), and *lex praevia* (the law must not operate retroactively) [23]. Collectively, these dimensions function as safeguards protecting individuals from arbitrary exercises of state power. However, they face significant challenges within the context of digital criminal law.

The dimension of *lex certa* is particularly problematic when applied to technology based offenses. In the rapidly evolving digital environment, the requirement of legal certainty often conflicts with the need for legal norms that are sufficiently flexible to accommodate technological developments. Article 27 paragraph (2) of the ITE Law employs the phrase “content containing gambling,” which raises complex interpretative questions in the context of digital algorithms: does the algorithm itself constitute content, or does the term refer only to the interface visible to users? [24].

Judicial decisions concerning cybercrime in Indonesia demonstrate that ambiguities in criminal law provisions have contributed to inconsistencies in legal application [25]. Different judges may reach divergent conclusions regarding whether a particular digital platform satisfies the elements of a criminal offense under the ITE Law, depending on their interpretation of technical terminology that has not been adequately defined. Such jurisprudential fragmentation creates legal uncertainty and ultimately weakens the deterrent effect of existing regulations.

Several legal scholars have proposed approaches to reconcile the tension between the principle of legality and the need for adaptive digital regulation. One such proposal involves

the use of regulatory sandboxes combined with periodic regulatory updates supported by technical consultation mechanisms between legislators and technology experts [26]. This approach enables regulations to be tested within controlled environments before broader implementation. In Indonesia, a similar mechanism could be developed through the involvement of the National Cyber and Crypto Agency (BSSN), academic institutions, and technology industry stakeholders.

The principle of legality also intersects with jurisdictional issues that are highly relevant to transnational online gambling cases. In cybercrime, determining the *locus delicti* often becomes ambiguous: servers may be located in one country, algorithm developers in another, business operators in a third jurisdiction, while victims are dispersed globally [27]. Without explicit and comprehensive criminal jurisdiction provisions addressing cybercrime, law enforcement efforts against international online gambling platforms become exceedingly difficult and lack a sufficiently strong legal foundation.

Moreover, the development of the legality principle within Indonesian criminal law must take into account evolving human rights standards and contemporary principles of justice [28]. A rigid and purely textual application of legality should not be allowed to shield digital offenders who exploit technical loopholes in existing regulations. A more dynamic interpretation of the legality principle one that preserves legal certainty while permitting systematic and teleological interpretation is necessary to ensure the realization of substantive justice in the digital era.

#### **4. Digital Criminology Theory and the Characteristics of Cybercrime**

Digital criminology, as a relatively recent branch of criminological inquiry, has made important contributions to understanding the unique characteristics of crime in cyberspace. Unlike conventional crimes, cybercrimes including algorithm based online gambling possess several distinguishing features: their transnational nature, capacity for simultaneous mass victimization, high levels of offender anonymity, and ease of replication and adaptation of criminal methods [29].

From the perspective of the Routine Activity Theory developed by Cohen and Felson, crime occurs when a motivated offender, a suitable target, and the absence of effective guardianship converge. In the context of online gambling, these three elements are readily present: digital platforms provide infrastructure for motivated operators, the continuously expanding internet user population constitutes a vast pool of potential targets, and limited technical capacity among law enforcement agencies creates weak supervisory conditions. Recent empirical studies concerning patterns of cybercrime victimization in Indonesia further support the applicability of this criminological framework to digital gambling activities [30].

The psychological impact of algorithmic design on user behavior also deserves serious attention. Recent research in behavioral psychology and behavioral economics demonstrates that digital gambling platforms systematically employ cognitive psychological principles including the *near miss effect*, *variable ratio reinforcement*, and *gamification elements* to foster compulsive behavior among users [31]. From a criminological perspective, this raises a significant normative question: can algorithmic designs that deliberately exploit users' psychological vulnerabilities be categorized as a form of fraud or psychological harm warranting criminalization?

Comparative studies on the effectiveness of various online gambling regulatory models offer valuable lessons for Indonesia. In Australia, the implementation of the Interactive Gambling Act, which has undergone several amendments, illustrates the continuing interaction between technological development and regulatory responses. In the Philippines, the dual role of the Philippine Amusement and Gaming Corporation (PAGCOR) as both regulator and gambling operator demonstrates a model fraught with conflicts of interest [32]. Meanwhile, China's strategy of comprehensive repression through blocking measures and criminalization has exhibited limited effectiveness due to the adaptive capabilities of illegal operators [33].

These comparative experiences suggest that Indonesia must develop a regulatory model tailored to its own legal, social, and technological conditions.

From the perspective of critical criminology, attention must also be directed toward the structural dimensions of online gambling associated with economic inequality and social vulnerability. Available data indicate that the most active online gambling participants in Indonesia predominantly originate from lower and middle income groups who perceive gambling as a shortcut for overcoming economic pressures [2]. In this context, a criminal law reformulation that focuses exclusively on punitive enforcement without accompanying social protection measures risks criminalizing victims while leaving the structural roots of the problem unaddressed. Accordingly, a humane and justice oriented criminal policy approach should form an integral component of the proposed reformulation framework [34].

## Research Methodology

This study employs a normative legal research approach, which within the Indonesian legal academic tradition is commonly referred to as library-based legal research. The selection of this method is based on the nature of the research problem, namely examining the conformity between existing legal norms and the realities of contemporary social phenomena, while also formulating juridical propositions concerning how the law should be developed in response to emerging challenges [35]. Normative legal research primarily relies on secondary data consisting of primary, secondary, and tertiary legal materials as its principal sources.

This research integrates three complementary approaches. First, the statute approach is utilized to systematically analyze all relevant positive legal provisions, including the New Criminal Code (Law Number 1 of 2023), particularly Article 426 concerning organizers of illegal gambling and Article 427 concerning participants in illegal gambling activities, which serve as the principal criminal provisions replacing Articles 303 and 303 bis of the former Criminal Code. The analysis also encompasses Law Number 7 of 1974 concerning Gambling Control, Law Number 11 of 2008 as amended by Law Number 19 of 2016 concerning Electronic Information and Transactions (ITE Law), Law Number 27 of 2022 concerning Personal Data Protection, as well as various implementing regulations governing digital space administration. The examination of Articles 426 and 427 of the New Criminal Code constitutes the central focus of this approach, as these provisions represent the most recent criminal law instruments directly relevant to the subject matter of this study and provide a benchmark for identifying existing normative gaps within Indonesia's gambling law framework [10]. This approach enables a comprehensive identification of normative weaknesses embedded in the current regulatory regime [36].

Second, the conceptual approach is employed to examine relevant legal doctrines, theories, and legal principles. Through this approach, the researcher identifies emerging concepts required to address contemporary legal challenges, including algorithmic accountability and risk-based digital regulation, which have not yet been fully incorporated into Indonesia's positive legal system but are highly relevant for filling existing regulatory gaps [37].

Third, a case approach is selectively applied to analyze relevant judicial decisions from both Indonesia and other jurisdictions facing comparable legal issues. Several court decisions concerning cybercrime and gambling offenses published through the Supreme Court of the Republic of Indonesia's judicial decision database serve as important references for this study [25].

The legal materials utilized in this research are classified into three categories. Primary legal materials consist of all applicable Indonesian legislation relating to gambling and cybercrime. Secondary legal materials include academic works such as peer-reviewed journal articles, scholarly books, conference papers, and other scientific publications discussing relevant issues from both Indonesian and comparative legal perspectives. Tertiary legal materials comprise legal dictionaries, encyclopedias, and other reference sources that assist in clarifying technical concepts and terminologies employed throughout the analysis [38].

The collection of legal materials was conducted through a systematic and comprehensive library research process. Literature searches were undertaken using various indexed academic databases, including Google Scholar, SINTA (Science and Technology Index), HeinOnline, and national legal databases. The source selection process was carried out by considering substantive relevance, publisher credibility, and the currency of information. Priority was given to materials published within the last five years (2021–2025) to ensure consistency with recent legal developments and contemporary scholarly discourse [39].

The legal materials were analyzed qualitatively using several methods of legal interpretation. These include grammatical interpretation, which focuses on the ordinary meaning of legal provisions; systematic interpretation, which examines the relationship between a particular provision and other provisions within the same legal system; teleological interpretation, which considers the objectives and purposes underlying the enactment of legal rules; and comparative interpretation, which evaluates legal provisions across different legal systems and jurisdictions. The combination of these four interpretative methods facilitates a comprehensive and in-depth analysis of the legal issues examined in this study [40].

## Results

### 1. Weaknesses of the Existing Criminal Law Framework in Addressing Algorithm Based Online Gambling in Indonesia

An analysis of the current criminal law framework reveals at least four interrelated dimensions of weakness that collectively contribute to the ineffective enforcement of law against algorithm-based online gambling. These deficiencies are not merely incidental or administrative in nature; rather, they reflect a more fundamental incompatibility between the conventional criminal law paradigm underlying existing regulations and the technical realities of the phenomena they seek to regulate.

The first weakness lies in the substantive formulation of criminal norms. Article 303 of the former Indonesian Criminal Code defined gambling as any game in which the possibility of obtaining a profit depends solely upon chance. Such a formulation contains significant ambiguity when applied to algorithm-based online gambling platforms. The algorithms employed by these platforms are not based on pure randomness; instead, they utilize pseudo-random number generators whose outcomes may be technically predictable and susceptible to manipulation by platform operators [3]. This ambiguity provides online gambling operators with room to argue that their activities do not fall within the legal definition of gambling as established by statutory law. Recent studies concerning digital gambling regulation in Indonesia confirm this fundamental weakness in the existing normative framework [7].

The enactment of Law Number 1 of 2023 concerning the New Criminal Code introduced a notable reform by explicitly distinguishing the criminal liability of gambling operators from that of gambling participants. Article 426 paragraph (1) imposes a maximum penalty of nine years' imprisonment or a Category VI fine upon any person who, without authorization, offers or provides opportunities for gambling, makes gambling a source of livelihood, or participates in a gambling enterprise. This provision extends liability to bookmakers, gambling organizers, operators of online gambling platforms, and parties actively promoting or facilitating illegal gambling activities [10]. Conversely, Article 427 addresses a gap that existed under the former Criminal Code by expressly criminalizing participants or players in illegal gambling activities, subjecting them to a maximum penalty of three years' imprisonment or a Category III fine. This normative separation provides a more comprehensive framework of criminal liability than that available under the previous legal regime.

Nevertheless, a closer examination reveals that both Articles 426 and 427 continue to define gambling offenses in highly general terms without accommodating the technical specificities of algorithm-based digital gambling platforms. Although the phrase “without authorization” constitutes the central element of both provisions, the law does not establish a specific licensing and supervisory mechanism for digital platforms, regulate cross-border server operations,

address the liability of algorithm developers, or contain provisions concerning the use of cryptocurrency as a gambling transaction instrument. In other words, while these provisions represent progress in expanding the scope of criminal liability to include players as well as operators, they remain inadequate in addressing the increasingly sophisticated and evolving digital modus operandi of online gambling [5].

The Electronic Information and Transactions Law (ITE Law), through Article 27 paragraph (2), prohibits the electronic transmission of gambling-related content. However, the law fails to define what constitutes “gambling content” within a digital context. More importantly, the provision targets the transmission of content rather than the algorithmic system design that constitutes the core mechanism of contemporary online gambling. In practice, enforcement of Article 27 paragraph (2) has predominantly relied upon website-blocking measures implemented by the Ministry of Communication and Information Technology rather than comprehensive criminal prosecution [24]. Such an approach addresses only the superficial manifestations of the problem while leaving the underlying business structures and algorithmic mechanisms untouched.

The second weakness concerns structural deficiencies in law enforcement. Although thousands of online gambling websites are blocked annually, only a small proportion result in criminal prosecution, and even fewer culminate in convictions against platform operators [5]. This phenomenon cannot be attributed solely to limited law enforcement capacity, although such limitations undoubtedly exist. Rather, it is also rooted in structural obstacles arising from regulatory ambiguity. Law enforcement discretion, which should operate within clearly defined normative boundaries, frequently encounters legal gaps that compel authorities to make inconsistent ad hoc assessments [6].

Jurisdictional issues constitute the most significant structural challenge. Most online gambling platforms targeting Indonesian users operate from servers located abroad, particularly in Southeast Asian countries such as the Philippines, Cambodia, and Vanuatu, or in jurisdictions with relatively permissive gambling regulations. In the absence of effective extradition treaties or international criminal law cooperation mechanisms specifically addressing cybercrime, enforcement against such operators is practically impossible when relying solely on domestic legal instruments [27]. Recent analyses of Indonesian criminal law reform in the context of transnational crime likewise identify this issue as a critical challenge requiring immediate attention [33].

The third weakness relates to digital evidentiary mechanisms. Although the ITE Law recognizes electronic documents as admissible evidence, existing regulations do not comprehensively govern authentication procedures, chain-of-custody requirements, or technical standards for proving algorithmic manipulation [29]. As a result, public prosecutors face substantial difficulties in constructing strong cases against online gambling operators, particularly when required to establish elements such as algorithmic manipulation or the operator’s knowledge of unlawful activities occurring within the platform. Contemporary scholarship on criminal liability in digital environments similarly highlights the limitations of existing evidentiary instruments [35].

The fourth weakness concerns victim recovery mechanisms and administrative sanctions. Conventional criminal law focuses primarily on punishing offenders while paying insufficient attention to victim rehabilitation and the prevention of future harm. Millions of users who have suffered financial and psychological losses due to algorithmic exploitation lack adequate legal mechanisms through which compensation or restorative remedies may be obtained [22]. Furthermore, the absence of effective administrative sanctions such as asset freezing, license revocation, and mandatory restitution renders imprisonment and monetary fines the only available enforcement tools. These sanctions are often ineffective, particularly given the difficulties associated with apprehending and prosecuting operators located outside Indonesia.

## 2. Reformulating Criminal Law Policy on Algorithm-Based Online Gambling: Normative and Comparative Perspectives

Based on the identification of existing regulatory weaknesses and comparative legal developments, this study proposes several substantive propositions regarding the reformulation of criminal law policy on algorithm-based online gambling in Indonesia. Such reformulation should not be understood merely as textual amendments or the addition of new statutory provisions; rather, it requires a more fundamental paradigmatic reorientation in the manner through which criminal law responds to technology-driven crime.

The first proposition concerns the necessity of enacting a comprehensive Digital Gambling Control Act. Although Articles 426 and 427 of the New Criminal Code constitute important advances particularly through their explicit distinction between sanctions imposed upon gambling operators (Article 426, carrying a maximum sentence of nine years' imprisonment) and gambling participants (Article 427, carrying a maximum sentence of three years' imprisonment) these provisions remain insufficient to address the regulatory complexities of digital gambling comprehensively [10]. The current regulatory framework, dispersed across the New Criminal Code, the ITE Law, and gambling-control legislation, generates normative fragmentation that weakens enforcement effectiveness. A dedicated statute is therefore required to provide precise technical definitions of digital gambling platforms and gambling algorithms, establish criminal liability for operators and system developers, regulate licensing and supervision mechanisms, and ensure consumer protection against algorithmic exploitation [12]. Such reform can no longer be postponed given the expanding social consequences of digital gambling activities [34].

The second proposition concerns the reformulation of criminal offense elements in a manner that is more technically precise. Although Article 426 of the New Criminal Code broadens liability to encompass individuals participating in gambling enterprises and those offering gambling opportunities to the public, it does not explicitly extend liability to developers and maintainers of algorithmic systems that constitute the operational backbone of online gambling platforms [10]. A programmer who designs a system for manipulating winning probabilities may argue that they are not "offering opportunities to gamble" in the conventional legal sense but merely writing software code. This loophole should be addressed through criminal provisions that explicitly criminalize the design, development, or operation of algorithmic systems intentionally created to manipulate gambling probabilities to the detriment of users. The concept of *algorithmic accountability*, which has gained prominence within international information technology law, may serve as an appropriate foundation for extending Article 426 into the more specific digital context [21].

Reformulation of corporate criminal liability is equally urgent. Online gambling platforms typically operate through complex corporate structures characterized by dispersed ownership and layered jurisdictions. Future regulations should explicitly recognize corporations as criminally liable entities for digital gambling offenses, subject to sanctions extending beyond financial penalties to include license revocation, permanent platform blocking, and mandatory restitution to victims [19]. Furthermore, personal liability for directors and controlling shareholders should also be established to prevent individuals from shielding themselves behind the corporate legal personality in cases of digital corporate crime [20].

The third proposition involves strengthening international cooperation mechanisms and extraterritorial jurisdiction. Given the inherently transnational nature of online gambling operations, Indonesia should actively expand the scope of international criminal law cooperation agreements. Moreover, consideration should be given to adopting stronger principles of extraterritorial jurisdiction for cybercrime, enabling the prosecution of offenders located abroad whose criminal conduct produces harmful effects within Indonesia. Such an approach is consistent with developments in public international law, which increasingly recognize the legitimacy of effect-based jurisdiction (*effects doctrine*) in addressing transnational offenses [27]. Recent studies on Indonesian criminal law reform in the

international sphere further emphasize the urgency of strengthening this jurisdictional framework [26].

The fourth proposition concerns the integration of adaptive regulatory mechanisms capable of responding more rapidly to technological developments without requiring a full legislative amendment process each time innovation occurs. One possible model would involve delegating authority to specialized regulatory bodies to issue binding technical regulations concerning algorithmic standards, transparency requirements, and platform auditing obligations, accompanied by significant administrative sanctions for non-compliance [17]. Such technical regulations must, of course, remain within the authority conferred by the parent legislation in order to ensure constitutional compliance and adherence to the principle of legality.

Finally, the reformulation of criminal law policy concerning online gambling cannot succeed without strengthening the technical capacity of law enforcement agencies in digital forensics and algorithmic analysis. Recent studies on law enforcement in the digital era confirm that the disparity in technical expertise between law enforcement officials and platform operators constitutes a major factor contributing to low prosecution success rates [38]. In the Indonesian context, addressing this challenge requires not only increased funding and technological infrastructure but also comprehensive reform of law enforcement education and training curricula. Digital competencies and algorithmic analysis should be incorporated as core professional skills. These efforts should be complemented by further institutional strengthening of specialized cybercrime units within the Indonesian National Police, initiatives that have gradually been developed in recent years [39].

## Conclusion

1. The current Indonesian criminal law framework contains multidimensional weaknesses that systematically undermine the effectiveness of law enforcement against algorithm-based online gambling. Although the New Criminal Code enacted through Law Number 1 of 2023 has introduced significant normative advancements—particularly through Article 426, which imposes criminal liability upon organizers of illegal gambling with a maximum penalty of nine years' imprisonment, and Article 427, which extends criminal liability to participants in illegal gambling activities with a maximum penalty of three years' imprisonment—both provisions remain broadly formulated and do not adequately accommodate the technical specificities of algorithm-based digital gambling platforms. Regulatory fragmentation across multiple statutes, unresolved jurisdictional obstacles, limitations in digital evidentiary mechanisms, and the absence of provisions explicitly criminalizing algorithmic manipulation collectively reflect a deeper paradigmatic mismatch between the existing criminal law framework and the technological realities of contemporary digital crime. Accordingly, it is recommended that the House of Representatives of the Republic of Indonesia and the Government undertake a comprehensive review of existing legislation and formulate a Digital Gambling Control Bill that is aligned with the reformative spirit embodied in the New Criminal Code.
2. The reformulation of criminal law policy concerning algorithm-based online gambling requires a comprehensive and multi-instrument approach. Such reform should encompass the enactment of a specialized digital gambling control statute containing precise technical definitions, provisions on algorithmic accountability, strengthened mechanisms for international cooperation, adaptive regulatory frameworks capable of responding to technological developments, and enhanced technical capacities among law enforcement agencies. It is further recommended that legislators adopt an interdisciplinary approach in the drafting of such legislation by involving experts from the fields of law, information technology, psychology, and economics. In addition, due consideration should be given to lessons derived from the regulatory experiences of other jurisdictions in governing digital

gambling, thereby providing relevant comparative insights for the development of an effective and future-oriented legal framework in Indonesia.

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