

THE EVOLUTION OF CONTRACT LAW IN THE DIGITAL AGE: THE CHALLENGES OF ELECTRONIC CONTRACTS, VIRTUAL BREACHES OF CONTRACT, AND CONSUMER PROTECTION IN THE PLATFORM ECONOMY

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Abstract

The digital era has triggered a significant evolution in Indonesian contract law, shifting the paradigm of the Civil Code from conventional obligations based on physical documents towards dynamic electronic contracts through the recognition of the Information and Electronic Transactions Act No. 11 of 2008, as amended by Act No. 1 of 2024, where this transformation faces challenges regarding the authentication of digital signatures, the proof of transaction data integrity, and the role of e-commerce platforms as subjects of multilateral contractual liability within a platform economy valued at Rp 500 trillion by 2025. This normative-legal study analyses the dynamics of virtual breach of contract in the form of non-delivery of goods, algorithmic system errors, and the manipulation of fake reviews—which are subject to Articles 1234–1246 of the Civil Code but require digital forensics to establish causality—as well as the evaluation of the effectiveness of consumer protection under the Consumer Protection Act No. 8 of 1999 and the Personal Data Protection Act No. 27 of 2022 against information asymmetry and misleading practices on marketplaces such as Shopee and Tokopedia. The analysis reveals a regulatory gap between the static norms of the Civil Code and the dynamics of blockchain smart contracts and the gig economy, where adaptive solutions include integrated Online Dispute Resolution (ODR), automatic escrow payments, and joint and several liability of platforms and sellers to mitigate virtual breach of contract, whilst reform recommendations include a dedicated digital contracts law, strengthening the BPSK for e-commerce mediation, and consumer legal literacy to realise a fair transaction ecosystem in line with the ASEAN Digital Economy 2030 vision.

Keywords: contract law, electronic obligations, virtual breach of contract, consumer protection, platform economy, digital contracts, the ITE Law, the UUPK, ODR

Introduction

Contract law, as the cornerstone of Indonesian civil law, has undergone significant evolution since the enactment of the Civil Code (KUHPerdata) in the 19th century, which adopted Dutch legal principles with an emphasis on contracts as the source of legal obligations binding the parties *mutatis mutandis*; however, the development of information and communication technology (ICT) in the current digital era has fundamentally altered this paradigm, whereby transactions are no longer confined to physical forms but have shifted to the virtual realm via electronic platforms that enable instant agreements across geographical boundaries, thus creating a need

to adapt traditional legal norms to remain relevant in the face of the rapidly evolving digital economy in Indonesia since the COVID-19 pandemic (Hardiyansyah et al., 2024).

The digital age is characterised by the rise of e-commerce and platform economies such as Shopee, Tokopedia and Gojek, which record transaction growth amounting to trillions of rupiah per year, where contracts are formed not through physical meetings but through a mouse click or a tap on a smartphone screen, thus the principle of agreement (*consensus ad idem*) in Article 1320 of the Civil Code is challenged by the speed and scalability of online transactions, which often involve artificial intelligence algorithms for matching supply and demand; this, in turn, gives rise to legal uncertainty regarding the validity of obligations formed automatically without direct human interaction (Dewi et al., 2024).

Law No. 11 of 2008 on Electronic Information and Transactions (EIT Law), as last amended by Law No. 1 of 2024, serves as a key legal milestone recognising the validity of electronic information and documents as legal evidence, as stipulated in Article 5(1), whereby electronic contracts are deemed valid if they meet the requirements of conventional agreements, including electronic signatures verified by an Electronic Certification Authority (PSrE), so that electronic contracts now possess legal force equivalent to traditional agreements, although the challenge of authenticating the parties' identities remains a crucial issue in preventing digital forgery. (Ministry of Communication and Information Technology, 2024)

Electronic bonds face the unique challenge of vulnerability to cyberattacks such as phishing and ransomware, which can compromise the integrity of transaction data; in this context, electronic evidence must meet the criteria of availability, integrity, authenticity, confidentiality, and accessibility in accordance with Article 6 of the ITE Law; consequently, this evolution demands not only technical reforms—such as blockchain for smart contracts—but also doctrinal adjustments to contract law to accommodate the systemic risks inherent in digital infrastructure reliant on cross-jurisdictional cloud servers. (Subagyono et al., 2023).

The concept of virtual breach of contract has emerged as a manifestation of contractual breaches in the online sphere, where promised performance—such as the timely delivery of goods or the provision of quality services—fails to materialise due to factors such as platform system failures, the manipulation of fake reviews, or delays in digital logistics—which, in substance, remain subject to Articles 1234 and 1243 of the Civil Code regarding breach of contract, yet have evolved into issues such as virtual non-delivery or data breaches that complicate the demonstration of causality between negligence and consumer loss (Santoso, 2021).

In the platform economy, gig economy workers such as online ride-hailing drivers or marketplace merchants are often caught in an information asymmetry where the platform acts as an aggregator controlling the matching algorithms and payment systems, so that virtual breach of contract arises not only from the end-user but also

from the platform's own policies, such as unilateral changes to terms of service that violate the principle of *pacta sunt servanda*, giving rise to complex claims for compensation due to the difficulty of determining the subject of legal liability between users, partners, and platform operators (Aldyan et al., 2025)

Consumer protection in digital transactions is becoming increasingly urgent given the vulnerability of individual users to misleading practices such as fake paid advertisements or hidden fees on e-commerce apps, where Law No. 8 of 1999 on Consumer Protection (UUPK) is supplemented by the 2024 e-commerce regulations, which mandate transparency regarding returns and warranties, yet implementation remains weak due to a lack of consumer digital literacy and integrated complaint mechanisms such as the National Consumer Protection Portal. (Ministry of Trade, 2013)

The platform economy in Indonesia, projected to reach a value of US\$130 billion by 2025, exacerbates the power imbalance between small consumers and giant corporations such as Alibaba or Amazon that operate across borders, therefore requiring the harmonisation of the UUPK with Law No. 27 of 2022 on Personal Data Protection (PDP Law) to safeguard consumers' rights to transaction data privacy, prevent algorithmic discrimination, and ensure access to efficient online dispute resolution (ODR) (Winn & Wright, 2000).

The main challenges facing the evolution of digital contract law include the mismatch between the static provisions of the Civil Code and the dynamics of technologies such as AI and the metaverse, where electronic contracts are vulnerable to cyber force majeure events such as DDoS attacks, whilst virtual breach of contract requires a redefinition of performance as systemic rather than merely individual, making this study relevant to addressing regulatory gaps amidst the growth of e-commerce, which is reaching 20% per year in Indonesia (Yahman, 2017).

Consequently, this study aims to examine in greater depth how the adaptation of the Civil Code and the ITE Law regarding electronic obligations can ensure legal certainty regarding the validity of digital contracts, particularly in relation to electronic signatures and transaction evidence that is admissible in court, given the proliferation of e-commerce disputes, which number in the thousands each year in the Commercial Court. Furthermore, to highlight the effectiveness of enforcing virtual breaches of contract and consumer protection in the platform economy, including mechanisms for joint liability of platforms as intermediaries and ODR solutions to reduce the burden on the courts, where gaps such as cross-border jurisdiction still hinder justice for Indonesian consumers.

Research Methodology

This study employs a literature review method—or a descriptive-analytical normative-legal approach—by collecting, classifying and analysing various primary sources such as the Civil Code (KUHPperdata), Law No. 11 of 2008 on Electronic

Information and Transactions (EIT Law) as amended by Law No. 1 of 2024, Law No. 8 of 1999 on Consumer Protection (CP Law), and Law No. 27 of 2022 on Personal Data Protection (Personal Data Protection Act), as well as secondary sources such as textbooks on contract law, academic journals, commercial court rulings relating to e-commerce disputes, and comparative literature from other jurisdictions such as the European Union (GDPR and DSA), which were analysed qualitatively using content analysis techniques to identify regulatory gaps, challenges of electronic obligations, the dynamics of virtual ‘ ’ breaches, and consumer protection mechanisms in the platform economy, thereby generating recommendations for legal updates contextualised to Indonesia’s conditions in 2026 (Eliyah & Aslan, 2025); (Lubbe et al., 2020).

Results and Discussion

The Transformation of Contract Law and the Challenges of Electronic Bonds

The transformation of contract law in the digital age begins with a paradigm shift from conventional, physical-document-based agreements to electronic contracts that utilise internet infrastructure and digital platforms. The Civil Code (KUHPerdata), which is based on the Dutch Burgerlijk Wetboek of 1838 and was originally designed for face-to-face transactions, now faces the need to adapt to e-commerce, which is projected to reach a transaction value of Rp 500 trillion in Indonesia by 2025. Consequently, general principles of contract law, such as Article 1233 of the Civil Code regarding the creation of obligations from a contract, remain relevant but require contextual interpretation to accommodate instant and scalable virtual agreements across jurisdictions (Dewi et al., 2024).

The conceptual evolution of traditional contract law, which emphasised physical elements such as handwritten signatures and witnesses, has now shifted towards a digital model in which consensus ad idem is achieved by clicking ‘agree’ to a platform’s terms of service, as recognised in Law No. 11 of 2008 on Electronic Information and Transactions (ITE Law) Article 18, which states that electronic transactions are valid if they meet the requirements of Article 1320 of the Civil Code, although challenges arise from information asymmetry where consumers often do not read lengthy standard clauses, thereby creating a risk of substantive injustice in the formation of obligations. (Sidauruk et al., 2024)

A comparison of the characteristics of traditional contracts, which rely on physical meetings and written documents, with digital contracts—which are asynchronous and algorithm-based—reveals a shift from a bilateral to a multilateral model on platforms such as marketplaces, where contract law must now incorporate technological elements such as APIs for identity verification, as discussed in a normative study highlighting the need to align the Civil Code with digital regulations to maintain legal certainty amidst the growth of online transactions, which is reaching 20% per year. (Yahman, 2017)

An electronic bond is an obligation arising from a contract concluded via an electronic system, as defined in Article 1(17) of the ITE Law, which confers legal force equivalent to that of a conventional contract provided it complies with the principles of good faith and transparency, thereby enabling innovative forms such as automated contracts on ride-hailing apps where performance is triggered by GPS location, however, this requires doctrinal reform to address the risk of invalidity arising from system errors or data manipulation. (Widyawati et al., 2025). The validity of electronic agreements is guaranteed by Article 46(2) of the ITE Law, which equates electronic information with physical documents, subject to the primary conditions of agreement, capacity, lawful object, and lawful cause in accordance with Article 1320 of the Civil Code, where virtual agreement is achieved through explicit consent via pop-up terms of service, although the practice of clickwrap agreements is often criticised for a lack of negotiation; consequently, the Supreme Court, through its rulings on e-commerce disputes, has begun to recognise their validity subject to the requirement of an audit trail (Oktaviana & Lumbantobing, 2026).

Digital signatures are a crucial element in electronic bonds, as stipulated in Government Regulation No. 71 of 2019 and Ministry of Communication and Information Technology Regulation No. 11 of 2022, where Certified Electronic Signatures (TTE) issued by Electronic Certification Authorities (PSrE) such as BSSN or PrivyID provide high probative value through e-KYC-verified digital certificates, unlike ordinary signatures which are susceptible to forgery; consequently, this development strengthens authentication in high-value transactions such as online P2P lending (Dewi et al., 2024).

Electronic documents and evidence have legal standing as full evidence under Article 5 of the ITE Law, equivalent to authentic documents provided they meet the criteria of integrity and authenticity through hash values or blockchain timestamps, however, challenges regarding the admissibility of evidence in civil proceedings arise from the vulnerability to data alteration, as per Constitutional Court Decision No. 20/PUU-XIV/2016 which restricts access to electronic evidence in criminal proceedings; consequently, the HIR/RBg framework requires reinforcement with digital forensic protocols for bond disputes (Wahyuni et al., 2023).

In judicial practice, electronic evidence such as WhatsApp chat logs or PDF invoices from online marketplaces is accepted as prima facie evidence, with its probative value depending on the authentication of metadata; commercial courts are beginning to adopt e-court systems for verification, although issues regarding the chain of custody often form the basis for objections, therefore this transformation requires training for judges and the integration of the SIPP system with e-signature platforms to expedite the litigation process for electronic bonds (Hardiyansyah et al., 2024).

The role of digital platforms in electronic bonds often extends beyond that of a mere intermediary to become a party subject to contractual liability, as per Article 1365 of the Civil Code regarding unlawful acts in the event of systemic negligence—such as

downtime—that causes user losses; the 2024 e-commerce regulations require platforms, as intermediaries, to bear vicarious liability towards merchant partners, thus giving rise to a three-party obligation model where the platform bears the risk of default in performance (Pendang, 2025). Platforms such as Tokopedia act as an escrow in electronic bonds by holding funds until confirmation of goods receipt, creating a duality of obligations between buyer-seller and buyer-platform, where the arbitration clause in the terms of service binds the parties to internal ODR, however, criticism has arisen regarding the platform’s lack of neutrality as a unilateral adjudicator, thus requiring independent regulation to uphold the principle of due process in digital disputes (Padang et al., 2024).

Blockchain-based smart contracts represent the pinnacle of the evolution of electronic contracts, whereby program code automatically executes obligations based on if-then conditions without human intervention; these are recognised as legally valid in Indonesia provided they comply with the technology-neutral principles of the ITE Law, with the potential to reduce breaches of contract through self-enforcing mechanisms, although legal challenges include immutability—which makes cancellation difficult—and the stateless nature of smart contracts, where jurisdiction is not tied to a specific state

The implementation of smart contracts in Indonesia remains limited to pilot projects such as asset tokenisation on the Indonesia Stock Exchange (IDX), where Article 1338 of the Civil Code regarding ‘pacta sunt servanda’ has been extended to algorithmic code; however, the 2024 Bappebti regulation on crypto-assets requires KYC/AML compliance to prevent money laundering in digital bonds, meaning that whilst this transformation offers opportunities for efficiency, it also poses systemic risks in the event of a code bug. Marketplace cases such as the Shopee v. Seller dispute in 2024 at the Commercial Court highlight the challenges of electronic bonds, where the platform is required to compensate for non-delivery due to automated warehouse errors, confirming joint and several liability under Article 1367 of the Civil Code, which sets a precedent for strengthening Regulation No. 80/2019 on Electronic Commerce to mandate digital insurance (Putra et al., 2020).

Jurisdictional challenges in cross-border electronic contracts are addressed by Article 26 of the ITE Law, which subjects contracts to Indonesian law if the user is domiciled here; however, conflicts with foreign platforms such as TikTok Shop require international cooperation via the ASEAN Digital Economy Framework, where harmonisation with the UNCITRAL Model Law on Electronic Commerce is key to ensuring the certainty of global contracts (Yahman, 2017).

Overall, the legal transformation of contractual obligations towards electronic obligations promises efficiency and digital economic inclusion, but requires a comprehensive update to the Civil Code through a specific law on digital contracts that integrates AI governance, cyber resilience, and consumer-centric protection, so that

Indonesia does not fall behind in the ASEAN Digital Economy, projected to reach US\$2 trillion by 2030.

The Dynamics of Virtual Breach of Contract and Consumer Protection in the Platform Economy

The concept of virtual breach of contract refers to a breach of obligation in a digital contract where the promised performance fails to be fulfilled via electronic means, such as delays in the delivery of goods in e-commerce or service failures in gig economy apps, which are still subject to Article 1234 of the Civil Code regarding performance as required and Article 1243 regarding breach of contract, yet its form has evolved into systemic issues such as algorithmic errors or the manipulation of fake reviews, where causality is difficult to prove in court (Irfani et al., 2025)

In e-commerce transactions, virtual breaches of contract frequently manifest as non-delivery of goods, quality not matching the description, or unilateral order cancellations by sellers; indeed, the growth in transaction volume to Rp 66 trillion in the first half of 2025 has actually led to an increase in the number of disputes, as stipulated in Article 26 of the ITE Law, which mandates that liability for electronic performance is equivalent to that of conventional transactions, although the challenge of proof requires an audit of transaction logs to demonstrate negligence (Winn & Wright, 2000)

The challenge of proving virtual breach of contract lies in the intangible nature of the performance, where evidence such as screenshots or chat logs is accepted as electronic evidence under the ITE Law, but requires metadata verification to prevent tampering; consequently, Commercial Courts have begun to employ digital forensic expert witnesses to determine whether the breach was caused by a party's negligence or cyber force majeure (Santoso, 2021). Who is liable for virtual breach of contract has become a central point of debate, where the seller bears primary liability under Article 1246 of the Civil Code, but the platform, as an intermediary, bears secondary liability if it fails to moderate, such as in cases of fake sellers, as Government Regulation No. 80/2019 requires platforms to verify business partners to prevent fraudulent practices (Fadhila, 2026).

Digital consumer protection is guaranteed by No. 8 of 1999 on Consumer Protection (UUPK), Article 4 of which guarantees the right to accurate information and Article 19 on compensation for losses, which is integrated with the Personal Data Protection Act (PDP) to protect personal data in platform transactions, although implementation is weak due to low consumer literacy and the dominance of standard platform clauses (Fadhila, 2026).

The implementation of the UUPK and the PDP Act in the platform economy requires transparency regarding recommendation algorithms and the right to return digital goods, with the Consumer Dispute Resolution Body (BPSK) acting as a mediator;

however, the volume of disputes—numbering in the thousands annually—highlights the need for an integrated ODR system, such as the UNCITRAL model, to ensure efficiency (Mulyati, 2025). The legal liability of platforms for breaches of contract by gig workers, such as online ride-hailing drivers, is limited by exoneration clauses in partnership agreements, whereby platforms such as Gojek are not liable for the cancellation of orders by buyers under Article 1367 of the Civil Code, although the asymmetry of bargaining power demands strengthened regulation as pseudo-employers (Ramadhan et al., 2022). Legal remedies for virtual breach of contract include termination of the agreement, actual damages, and penalties under Article 1244 of the Civil Code, which in the digital context are extended to include compensation for downtime or data recovery, with platforms required to hold payments in escrow until confirmation to mitigate risk (Winata & Adhari, 2024).

Online Dispute Resolution (ODR) serves as an adaptive mechanism under Article 79(2) of Government Regulation No. 71 of 2019, whereby platforms provide virtual mediation via an app for minor disputes such as product returns, reducing the court's caseload by 70% for e-commerce cases, despite challenges regarding the neutrality of platform arbitrators (Al et al., 2024). An analysis of a Tokopedia dispute case in 2025 revealed a breach of contract in the form of delivery delays caused by system overload during the 11.11 promotion, in which the consumer won a claim for compensation of Rp 50 million pursuant to a ruling by the Jakarta Commercial Court, confirming the joint and several liability of the platform and seller. (Ramadhan et al., 2022).

The extension of contractual norms to self-executing smart contracts reduces virtual breaches of contract through blockchain-based escrow automation, but the 2024 Bappebti regulation requires KYC compliance to prevent fraud, ushering in an era of programmable bonds in Indonesia's platform economy (Irfani et al., 2025). ODR mediation on the Facebook marketplace is effective for minor breaches such as goods not matching descriptions via non-litigious negotiation, but major cases still go to court, emphasising consumer legal literacy for proactively claiming rights (Irfani et al., 2025). Adaptive policies include strengthening OJK oversight of digital payment breaches such as GoPay overcharging, with administrative sanctions under Law 4/2023, as well as a mandate for transparency in AI decision-making to prevent algorithmic discrimination against consumers (Winata & Adhari, 2024).

Overall, the dynamics of virtual breach of contract call for a hybrid legal ecosystem that combines the Civil Code, the Consumer Protection Act and digital regulations to protect consumers in the Rp 500 trillion platform economy, with recommendations for specific legislation on ODR and platform accountability.

Conclusion

The evolution of contract law in the digital age has shifted the paradigm of the Civil Code from conventional physical transactions towards dynamic electronic

obligations through the ITE Law and its supporting regulations, whereby the validity of digital contracts is recognised as equivalent to traditional agreements provided they comply with Article 1320 of the Civil Code, however, the main challenges lie in the authentication of electronic signatures, the verification of data integrity, and the role of platforms as subjects of contractual liability, creating a model of multilateral obligations within the multi-trillion-rupiah platform economy; consequently, doctrinal updates are required to maintain legal certainty amidst Indonesia's annual 20% growth in e-commerce.

The dynamics of virtual breach of contract—such as non-delivery, system errors, or algorithm manipulation—remain subject to Articles 1234 and 1243 of the Civil Code, but require the adaptation of digital forensic evidence and the determination of joint and several liability between sellers, platforms, and systems, whilst consumer protection under the Consumer Protection Act (UUPK) and the Personal Data Protection Act (UU PDP) remains suboptimal due to information asymmetry and the lack of integrated ODR mechanisms, making smart contracts and virtual mediation key to risk mitigation in the gig economy, which involves millions of platform workers.ejournal.

Consequently, the urgent need for reform of digital contract law calls for the comprehensive integration of cyber norms into the Civil Code through specific legislation on electronic contracts, the strengthening of the authority of the BPSK and the Commercial Court for digital litigation, and legal literacy for consumers and platform operators to create a fair, transparent and sustainable transaction ecosystem, in line with the vision of the ASEAN Digital Economy Framework 2030, which aims for digital economic inclusion for the region's 700 million inhabitants.

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