Journal of Law and Resilient Future
How to Cite: Ihsanuddin, W., Balgis, E.R., &, Liangfei, Z. (2026). Vulnerable Convenience: The Validity of Digital Agreements in Online Lending under Article 1320 of the Indonesian Civil Code. (2026). *Journal of Law and Resilient Future*, *1*(1), 59-75.
Doi: https://doi.org/10.62503/jlrf.1.1.59-75
Website Journal: https://journal.dealingspublishing.com/index.php/JLRF/

RESEARCH

Vulnerable Convenience: The Validity of Digital Agreements in Online Lending under Article 1320 of the Indonesian Civil Code

Wahid Ihsanuddin[1]*, Erna Rahma Balgis [2], and Zhang Liangfei [3]

*Correspondence:

[1]Sultan Ageng Tirtayasa University, Indonesia

[2]Trisakti University, Indonesia

[3]North Henan Medical University, China

Received: 22/08/2026

Accepted: 02/09/2026

Abstract

The rapid development of online lending has transformed the formation of loan agreements from conventional arrangements into electronic contracts. This development raises questions about whether the convenience of electronic contracting continues to satisfy the validity requirements under Article 1320 of the Indonesian Civil Code. This study aims to examine the validity of digital agreements in online lending by assessing the requirements of consent, legal capacity, a certain subject matter, and a lawful cause. This study employed normative legal research using statutory and conceptual approaches. Primary legal materials included the Indonesian Civil Code, Law No. 1 of 2024 concerning the Second Amendment to the Electronic Information and Transactions Law, and Financial Services Authority Regulation No. 40 of 2024 concerning Information Technology-Based Joint Funding Services. The materials were analyzed qualitatively through a two-dimensional framework of formal and substantive validity. The study found that electronic mechanisms provide a legal basis for formal validity, particularly in establishing consent and identifying the subject matter of the agreement. However, substantive validity depends on the legal capacity of the parties, the legality of the provider, and the lawful cause of the agreement. The three regulatory instruments therefore operate in a complementary but partially congruent framework.The study contributes a two-dimensional framework for assessing digital loan agreements by connecting general contract validity under Article 1320 with electronic transaction and sector-specific regulations. The framework strengthens theoretical analysis of electronic contracts and provides a practical basis for providers and regulators to ensure that technological convenience is accompanied by substantive legal compliance.

Keywords: Digital Agreement, Online Lending, Contract Validit, Indonesian Civil Code; Electronic Contract.

Copyright © 2026 by Authors, Published by Dealings Publishing. This work is licensed under the CC BY 4.0 (https://creativecommons.org/licenses/by/4.0/).

INTRODUCTION

Money is a fundamental necessity in modern society. It is required to meet both consumptive and productive needs. Therefore, access to financing is an important prerequisite for individual economic welfare. The high demand for access to financing is not always matched by the accessibility of conventional financial institutions. Consequently, some members of the public have turned to information technology-based financing schemes that offer faster and simpler access, commonly known as online lending or fintech lending (Hidayatulloh & Arifin, 2026). This development demonstrates that technology has transformed how people obtain financing. It has also shaped the legal relationship between fund providers and recipients (Lubis & Putra, 2022).

The development of digital financing services is also evident in various application-based lending and paylater services, such as SPayLater, SPinjam, and Kredivo. These services allow users to apply for financing and establish contractual relationships electronically (Sulistyaningrum, 2024). Such convenience increases efficiency in forming legal relationships. At the same time, however, it raises questions about whether these fast and simple processes can still ensure compliance with the requirements for a valid agreement under civil law. This issue has also been examined in broader studies of contract validity in the digital era (Irianto, 2024). Thus, the digitalization of financing concerns not only transactional convenience. It also raises questions regarding the validity of contractual relationships formed through electronic systems.

Article 1754 of the Indonesian Civil Code defines a loan agreement as an agreement in which one party provides the other party with a certain quantity of consumable goods. The latter party must return the same quantity of goods of the same kind and quality. This provision establishes the general basis for a loan for consumption. In the context of monetary loans, Article 1756 of the Indonesian Civil Code specifically provides that a debt arising from a money loan consists only of the amount of money stated in the agreement.

In the context of online lending, this legal relationship is further regulated by Indonesian Financial Services Authority Regulation (POJK) Number 40 of 2024 concerning Information Technology-Based Joint Funding Services (LPBBTI). Article 1 point 1 defines LPBBTI as the provision of financial services that brings fund providers and fund recipients together to conduct funding, either conventionally or based on sharia principles, directly through an electronic system using the internet. These provisions demonstrate that the use of electronic media does not eliminate the contractual nature of the relationship between the parties (Farhan & Kafi, 2023).

Therefore, a funding agreement formed through an electronic system must still satisfy the requirements for a valid agreement under Article 1320 of the Indonesian Civil Code. These requirements are consent, capacity, a certain subject matter, and a lawful cause. This premise is also affirmed in studies concerning the legal consequences of failure to satisfy the subjective requirements of an agreement (Senda et al., 2024). Furthermore, in the context of electronic transactions, Article 18 paragraph (1) of Law Number 11 of 2008 concerning Electronic Information and Transactions, as last amended by Law Number 1 of 2024, provides that electronic transactions embodied in electronic contracts are binding upon the parties.

Article 18 paragraph (1) of the Electronic Information and Transactions Law reinforces the legal position of electronic contracts as binding relationships between the parties. However, such binding force does not mean that every electronic contract automatically satisfies all requirements for

contractual validity under the Indonesian Civil Code. Therefore, the existence of an electronic contract must still be assessed against the applicable requirements for a valid agreement under Indonesian civil law (Guspitawaty & Santiago, 2023; (Lermansyah et al., 2023).

According to data from the Financial Services Authority, outstanding funding in the fintech peer-to-peer lending industry reached IDR 80.07 trillion as of February 2025, representing annual growth of 31.06 percent. During the same period, the industry's 90-day default rate (TWP90) stood at 2.78 percent, with funding classified under TWP90 amounting to IDR 2.22 trillion. At least 20 providers recorded TWP90 rates above 5 percent (Khaerunnisa, 2025). The substantial value of such funding demonstrates that contractual relationships formed through electronic systems have developed on a significant scale.

These data do not, by themselves, establish the existence of defects in contractual validity. However, they demonstrate the extensive scope of legal relationships that require certainty regarding the formation and enforceability of digital contracts. Accordingly, the development of the digital financing industry strengthens the urgency of examining the legal aspects of agreements formed through electronic systems (Gunawan et al., 2025; Anastasia, 2023).

Thus, the issue requiring examination is not merely the increasing use of online lending. Rather, it concerns whether the convenience of forming such agreements is accompanied by adequate mechanisms to ensure compliance with the requirements for a valid agreement. This issue is important because legal relationships formed through applications continue to create rights and obligations for the parties. Therefore, the digital mechanisms used to form agreements must be analyzed against the validity standards established by civil law.

In this context, Article 1320 of the Indonesian Civil Code should not be treated merely as a provision to be formally examined after an agreement has been formed. Its four requirements must be related to the process of forming agreements electronically because each requirement has legal consequences for the enforceability of the contractual relationship. Consent requires the parties' intention to be legally bound. Capacity concerns the legal ability of the parties to perform legal acts. A certain subject matter concerns the clarity of the subject matter agreed upon. A lawful cause concerns whether the agreement is consistent with the law, morality, and public order.

With respect to consent, Article 1321 of the Indonesian Civil Code further provides that no agreement has legal force if consent is given due to mistake or obtained through coercion or fraud. This provision is relevant to assessing whether consent given through electronic mechanisms genuinely reflects the parties' free will. Accordingly, the electronic consent process should not be assessed solely on the basis of whether an act of consent occurred. The circumstances underlying the formation of that intention must also be considered.

Studies concerning the application of Article 1320 of the Indonesian Civil Code to electronic contracts demonstrate that the requirements for a valid agreement remain the basis for determining the enforceability of contractual relationships, even when consent is formed through an electronic system (Hermawan et al., 2024). In addition, Article 1338 paragraph (3) of the Indonesian Civil Code requires agreements to be performed in good faith. Therefore, the formation and performance of digital agreements must be placed within the framework of a contractual relationship based on good faith, as affirmed in studies specifically examining the principle of good faith in electronic contracts (Hidayah, 2021; Wafda & Setyowati, 2022). This principle is further reinforced by electronic

transaction law through Article 17 paragraph (2) of the Electronic Information and Transactions Law. The provision requires parties to electronic transactions to act in good faith when conducting interactions and/or exchanging electronic information and/or electronic documents during the transaction.

The convenience of forming digital agreements becomes a legal issue when processes previously conducted through direct interaction can be completed through several stages within an application. User identification, data entry, acceptance of terms and conditions, and provision of electronic consent allow contractual relationships to be formed without physical meetings between the parties. Such mechanisms are essentially technological developments that can increase transactional efficiency. However, they do not eliminate the need to ensure compliance with legal requirements governing the formation of agreements.

Nevertheless, from a legal perspective, such convenience must not be understood as reducing the standards for contractual validity. In electronic transactions, electronic documents also have the status of lawful evidence under Article 5 paragraph (1) of the Electronic Information and Transactions Law, provided that they satisfy the requirements established by the law. The status of electronic documents as evidence does not, by itself, mean that the contractual relationship embodied in those documents has satisfied all requirements for a valid agreement.

A study relevant to the present research was conducted by (Mulyadi et al., 2024) who examined the validity of online lending agreements under Article 1320 of the Indonesian Civil Code. The study concluded that online lending agreements satisfied the requirements for a valid agreement and were therefore legally binding upon the parties. The study is relevant to the present research because both studies place Article 1320 of the Indonesian Civil Code as the primary basis for assessing the validity of contractual relationships in online lending. This conclusion is also consistent with a study concerning equitable and legally certain legal protection for online lending consumers under the same framework of the Indonesian Civil Code (Putra & Waluyo, 2023).

In contrast to these studies, (Nicholas, 2025) reached a different conclusion in examining the position of illegal online lenders as creditors in bankruptcy proceedings. The study concluded that a violation of the capacity requirement under Article 1320 of the Indonesian Civil Code constitutes a violation of a subjective requirement. Such a violation renders the agreement voidable because an illegal online lending provider that does not satisfy the Financial Services Authority's licensing requirements cannot be regarded as a legally capable subject for entering into a funding agreement.

Both Mulyadi and Nicholas place Article 1320 of the Indonesian Civil Code at the center of their analyses. Both also recognize that formal consent has been established. Nevertheless, they reach opposing conclusions regarding the validity of the agreement. One concludes that the agreement is legally binding, while the other concludes that it is voidable due to a defect in the provider's capacity. This difference provides an important starting point for the present research. It demonstrates that the validity of online lending agreements cannot be generalized solely from the existence of consent. Rather, it also depends on the legal capacity of the provider as a party to the agreement.

Based on this gap, this research analyzes the validity of digital agreements in online lending through two dimensions: formal validity and substantive validity. The formal validity dimension is used to analyze the formation of consent and the certainty of the subject matter of the agreement. The substantive validity dimension is used to examine the legal capacity of the parties and the existence

of a lawful cause. This distinction constitutes the analytical framework of the research. It is not a separate normative classification under Article 1320 of the Indonesian Civil Code.

This research uses a normative juridical approach to analyze the validity of digital agreements in online lending under Article 1320 of the Indonesian Civil Code. The analysis relates this provision to the Electronic Information and Transactions Law and POJK Number 40 of 2024 concerning LPBBTI. The research focuses on the mechanism for forming digital agreements and the fulfillment of the elements of consent, capacity, a certain subject matter, and a lawful cause. This research aims to analyze whether digital agreement mechanisms that provide convenience for users can still ensure compliance with the requirements for a valid agreement under Indonesian civil law.

The objective of this research is to analyze the validity of digital agreements in online lending under Article 1320 of the Indonesian Civil Code. The analysis focuses on whether the convenience provided by digital agreement mechanisms remains consistent with the requirements for a valid agreement under Indonesian civil law. Overall, this research positions digital contract formation as a development in transactional mechanisms that must continue to satisfy the requirements for contractual validity. Through an analysis of formal and substantive validity, this research examines the fulfillment of the requirements of consent, capacity, a certain subject matter, and a lawful cause in digital online lending agreements. The analysis is expected to provide an understanding of the boundary between the convenience of electronic contract formation and the standards of contractual validity under Indonesian civil law.

RESEARCH METHODS

This research is designed as normative legal research, namely research conducted by examining library materials or secondary data as the basis of analysis through the examination of legislation and legal literature relevant to the issue under study (Soekanto & Mamudji, 2015). Normative legal research is prescriptive in nature. It does not merely describe legal facts as they exist. Rather, it seeks to provide a prescription regarding what the law ought to provide in relation to the legal issue under examination (Marzuki, 2013). This research design employs two approaches: the statute approach and the conceptual approach.

The statute approach is conducted by examining legislation relevant to the legal issue under study. Meanwhile, the conceptual approach is based on views and doctrines developed in legal scholarship. It is used to identify ideas that give rise to relevant legal meanings, legal concepts, and legal principles (Marzuki, 2013). These two approaches are applied in an integrated manner to examine the validity of digital agreements in online lending through a two-dimensional framework: formal validity and substantive validity, as described in the preceding section.

As normative legal research based on library research, this study is not conducted at a particular site or field location, as would be the case in empirical legal research. Instead, it relies on the examination of legal materials available through library-based research (Soekanto & Mamudji, 2015). The examination of primary, secondary, and tertiary legal materials is conducted through official databases of legislation and databases of national and international legal journals.

Legal materials are collected through documentary study of materials relevant to the research problem. The primary legal materials consist of three main legal sources: the Indonesian Civil Code, particularly Article 1320 and related provisions; Law Number 1 of 2024 concerning the Second

Amendment to the Electronic Information and Transactions Law; and Financial Services Authority Regulation Number 40 of 2024 concerning Information Technology-Based Joint Funding Services.

The secondary legal materials consist of 40 sources, including books, national and international legal journal articles, previous research findings, and the views of legal scholars relevant to the validity of digital agreements and online lending.

The tertiary legal materials consist of legal dictionaries and reference sources used to provide additional explanations of the primary and secondary legal materials. After the legal materials are collected, a textual study is conducted to examine, review, and identify portions of the library materials that directly relate to the research problem. The identified legal materials are then classified according to their relevance to the issue of the validity of digital agreements in online lending.

The collected legal materials are analyzed qualitatively using the descriptive-analytical method. This method systematically presents the legal materials and subsequently analyzes them to clarify the issues under examination (Ali, 2009). The analysis follows the stages of legal research, beginning with the identification of legal facts and the collection of relevant legal materials. It then proceeds to an examination of the legal issue based on the collected materials and concludes with a prescription concerning the legal issue under consideration. This method is used to connect legal provisions with relevant concepts and doctrines in addressing the research problem.

In this research, the analysis places Article 1320 of the Indonesian Civil Code as the primary analytical framework. Each requirement for a valid agreement is then examined against the mechanism for forming digital agreements in online lending services. The results of the analysis are subsequently organized systematically into an exposition explaining whether each requirement for a valid agreement has been satisfied.

The validity of legal materials in normative legal research is established through the consistent use of authoritative primary legal materials. These materials consist of legislation that remains in force and has not been repealed. They serve as the primary references and cannot be replaced by secondary legal materials. To ensure the validity of secondary legal materials, this research conducts cross-checking among sources. This process involves comparing the views and findings presented in one journal source with those in other journal sources addressing the same legal issue. The cross-checking process is conducted to ensure consistency and identify differences in views among legal scholars.

In addition, validation is conducted by tracing each quotation and reference back to its original source. This step ensures that the cited legal material is genuinely contained in the relevant source. It also ensures accuracy in the use of legal materials and consistency between the statements presented in the research and the sources cited. This process is consistent with the requirements of accuracy and scholarly objectivity in legal writing.

RESULTS AND DISCUSSION

Results

An examination of Article 1320 of the Indonesian Civil Code shows that the validity of online lending agreements has a clear textual basis, although the provision was formulated long before electronic contracts emerged. The first requirement, consent, requires the parties' free will to bind themselves. The second requirement, capacity, requires the contracting party to be a legal subject capable of

performing legal acts. The third requirement, a certain subject matter, requires clarity regarding the subject matter of the agreement. The fourth requirement, a lawful cause, requires that the agreement not contravene legislation, morality, or public order.

Article 1754 of the Indonesian Civil Code further strengthens this framework specifically for loan agreements. It provides that such a legal relationship arises from the delivery of a certain amount of money that must be returned in the same amount. A study on the application of Article 1320 of the Indonesian Civil Code to electronic contracts confirms that these four requirements remain the primary basis for determining the enforceability of contractual relationships, even when consent is formed through an electronic system (Hermawan et al., 2024).

An examination of Article 1320 of the Indonesian Civil Code indicates that two requirements are directly relevant to vulnerabilities in the validity of digital online lending agreements: capacity and lawful cause. The capacity requirement is relevant because user identity verification in online lending applications occurs without physical meetings. Therefore, it cannot simply be assumed from the submission of digital documents that the transacting party is a legal subject with the requisite capacity (Vebriani & Danyathi, 2025).

The lawful cause requirement is also vulnerable because Article 1335 of the Indonesian Civil Code provides that an agreement without a cause, or with an unlawful cause, has no legal force. This provision provides a basis for examining the legality of the provider as part of the validity of the agreement itself. A study on the legal consequences of failing to satisfy the subjective requirements under Article 1320 of the Indonesian Civil Code confirms that such failure may have serious legal implications, including the annulment of an agreement or a declaration that the agreement was invalid from the outset (Senda et al., 2024).

On the other hand, Law Number 1 of 2024 concerning the Second Amendment to the Electronic Information and Transactions Law specifically regulates the validity of the electronic medium used to form online lending agreements. Article 5 of the Law provides that electronic information and/or electronic documents constitute lawful evidence and expand the forms of evidence recognized under Indonesian procedural law. Accordingly, consent given by users through an application, even without a paper document, may constitute valid consent.

Article 6 regulates the authenticity, integrity, and accessibility requirements for electronic information so that it may be treated as equivalent to a written document. Article 11 sets out six requirements for an electronic signature to have valid and binding legal force and legal effect for the parties. These provisions provide a strong legal basis for the validity of electronic media. This position is affirmed by normative research on the legality of digital signatures, which treats the Indonesian Civil Code and Law Number 1 of 2024 as primary legal materials and concludes that digital signatures are valid and equivalent in legal status to written signatures (Sukma, 2025).

Articles 5, 6, and 11 of Law Number 1 of 2024 have also been consistently examined in various other contexts involving electronic contracts beyond online lending. A study on the legal force of electronic agreements from the perspectives of the Indonesian Civil Code and the Electronic Information and Transactions Law confirms that electronic documents and signatures have legal status equivalent to their conventional counterparts, provided that their authenticity and integrity requirements are satisfied (Septiari & Ujianti, 2025). Meanwhile, a study on the legality of electronic contracts in relation to the principle of good faith in e-commerce transactions based on Wilstheorie demonstrates that the

validity of electronic contracts also depends on consistency between the parties' expressed and internal intentions (Handayani et al., 2024). A study of the evidentiary force of electronic signatures in individual contracts further confirms that the legal regulation of electronic signatures in Indonesia continues to develop, although their application in civil disputes still requires further strengthening (Nurmawanadilah, 2024).

The legal framework governing the validity of digital online lending agreements is not established solely through the Indonesian Civil Code and Law Number 1 of 2024. It is also reinforced by Financial Services Authority Regulation Number 40 of 2024 concerning Information Technology-Based Joint Funding Services (LPBBTI). The regulation governs provider licensing, user identity verification as part of governance requirements, the clarity of the subject matter of funding agreements, and the prohibition of operating without authorization from the Indonesian Financial Services Authority (OJK). The specific regulation of licensing obligations demonstrates normative recognition that the legality of the provider is an indispensable prerequisite for the validity of the funding agreement it forms (Andayani, 2025).

The enactment of POJK Number 40 of 2024 should be understood as a response to verification vulnerabilities identified in previous studies on fintech lending practices in Indonesia. Regarding the legality of electronic signatures as a form of authorization in banking credit agreements, the study shows that such instruments provide convenience for prospective customers without requiring direct face-to-face interaction, although certain risks associated with electronic signing remain in practice (Firdaus et al., 2022). This finding indicates variations in implementation among providers, which remain unresolved through normative recognition alone. A study of the legal aspects of electronic transactions in digital banking and financial technology further supports this indication. It demonstrates that electronic transactions are legally binding upon the parties, but the effectiveness of authentication safeguards varies among providers (Zulkifli et al., 2025). This layered approach is relevant to the nature of digital online lending agreements, which extends beyond the mere recognition of the validity of electronic media (Nurhisyam et al., 2024).

Online lending debtors may not realize that electronic consent provided through an application does not automatically ensure that the provider satisfies the legal capacity requirement under Article 1320 of the Indonesian Civil Code (Risal, 2024). Therefore, validity should ideally be examined through multiple layers rather than relying solely on the validity of an electronic signature (Hartati & Syafrida, 2022). This argument reinforces the position of POJK Number 40 of 2024 as an instrument that complements, rather than replaces, the examination of contractual validity under the Indonesian Civil Code. Technical verification of user identity has developed much faster than verification of the provider's legality (Suyadi et al., 2022). Strengthening verification mechanisms serves as an evidentiary instrument that enables more reliable examination of consent and capacity. This finding is consistent with a study of the legal implications of electronic contracts from a civil law perspective in the digital era (Simamora et al., 2025).

To clarify the normative relationship between the requirements for a valid agreement and the regulation of electronic contracts in online lending, this research maps the relationship between Article 1320 of the Indonesian Civil Code, Articles 5, 6, and 11 of Law Number 1 of 2024, and POJK Number 40 of 2024. This mapping is used to identify the extent to which each regulation supports the fulfillment of consent, capacity, a certain subject matter, and a lawful cause in the formation of digital agreements. The results of this mapping are presented in Table 1.

Table 1. Mapping of the Relationship between Article 1320 of the Indonesian Civil Code, Law No. 1 of 2024, and POJK No. 40 of 2024 in Assessing the Validity of Digital Online Lending Agreements

Aspect Examined	Article 1320 of the Indonesian Civil Code	Articles 5, 6, and 11 of Law No. 1 of 2024	POJK No. 40 of 2024
Consent	First requirement: the parties' consent to bind themselves.	Article 5: electronic information/documents constitute lawful evidence.	Regulates the mechanism for electronic consent in LPBBTI funding agreements.
Capacity	Second requirement: capacity to enter into a binding agreement.	Article 11: six requirements for an electronic signature to have valid legal force.	Requires user identity verification (Know Your Customer) as part of LPBBTI governance.
Certain Subject Matter	Third requirement: a certain subject matter (the subject matter of the agreement).	Article 6: requirements concerning the authenticity, integrity, and accessibility of electronic information.	Requires clarity regarding the subject matter of funding (amount, interest, and term).
Lawful Cause	Fourth requirement: a cause that does not violate the law, morality, or public order.	Not directly regulated, the Electronic Information and Transactions Law regulates the validity of the electronic medium, rather than the substantive validity of the agreement.	Prohibits operation without OJK authorization; regulates interest-rate limits and prohibitions on misuse of funds.

Source: Processed by authors, 2026.

To clarify the normative relationship between the requirements for a valid agreement and the regulation of electronic contracts in online lending, this research maps the relationship between Article 1320 of the Indonesian Civil Code, Articles 5, 6, and 11 of Law No. 1 of 2024, and POJK No. 40 of 2024. This mapping is used to identify the extent to which each regulation supports the fulfillment of consent, capacity, a certain subject matter, and a lawful cause in the formation of digital agreements. The results of this mapping are presented in Table 1.

The mapping results show a strong formal normative relationship between Article 1320 of the Indonesian Civil Code and Articles 5, 6, and 11 of Law No. 1 of 2024, particularly with respect to consent and a certain subject matter. However, gaps remain in the other two elements. Regarding capacity, the gap is implementation-related. Of the 102 OJK-licensed fintech lending companies examined, only seven actually verified their users' electronic signatures (Falaq & Multazam, 2024).

Thus, normative recognition of the validity of electronic signatures does not necessarily reflect adequate verification practices in the field. Regarding lawful cause, the gap is structural. Law No. 1 of 2024 does not regulate the substance of agreements at all. Therefore, fulfillment of the lawful-cause requirement depends entirely on providers' compliance with POJK No. 40 of 2024. This dependency does not arise with respect to consent or a certain subject matter.

Based on these findings, this research argues that the relationship among the three regulations is essentially complementary within a hierarchical framework. Article 1320 of the Indonesian Civil Code provides the general basis for the requirements of a valid agreement. Articles 5, 6, and 11 of Law No. 1 of 2024 establish the validity of the electronic medium and strengthen the evidentiary basis for consent and capacity. Meanwhile, POJK No. 40 of 2024 provides a mechanism for examining the legality of providers, which determines whether the lawful-cause requirement is satisfied. The three regulations form an interconnected legal regime. Therefore, they satisfy one of the requirements for applying the principle of lex specialis derogat legi generali, namely that the specific provision must operate within the same legal framework as the general provision that it particularizes (Nasrullah et al., 2025).

These findings demonstrate that the relationship among the three regulations is partially congruent rather than fully congruent. The legal argument that can be developed from these findings is that POJK No. 40 of 2024 functions as a lex specialis that operationalizes the requirements of capacity and lawful cause for the LPBBTI sector. Meanwhile, the examination of consent and a certain subject matter may rely sufficiently on the general norms of Article 1320 of the Indonesian Civil Code. These norms are reinforced by the recognition of the electronic medium under Law No. 1 of 2024.

Regarding the convenience of forming digital agreements, which is a defining feature of services such as SPayLater, SPinjam, and Kredivo. Although Articles 5, 6, and 11 of Law No. 1 of 2024 have comprehensively established the validity of electronic media, their practical application continues to face challenges in substantively verifying the capacity of users and providers. These matters are not explicitly regulated in those provisions. Similar challenges have also been identified internationally.

A study on contractual validity in the digital era confirms that digital contracts cannot be separated from the conventional civil law framework applicable in the relevant jurisdiction. Therefore, the technical convenience of contract formation does not eliminate the need to substantively examine the requirements for contractual validity (Irianto, 2024). This parallel finding indicates that the gap between formal and substantive validity is not merely a national issue. A similar pattern also appears in studies concerning the application of the principle of good faith to sharia fintech contracts. Such studies confirm that good-faith issues in technology-based financing contracts are universal and not limited to a single jurisdiction (Wafda & Setyowati, 2022).

Comparisons with studies of the broader digital financial sector further strengthen this interpretation. Digital constitutionalism in the development of Indonesian banking law emphasizes that the convenience and speed of access to digital financial services must be balanced with guarantees for the protection of users' constitutional rights. This is necessary to prevent technological development from causing adverse consequences through uncontrolled ease of access (Kurniawan & Putri, 2022).

Studies on the validity of electronic agreements and the settlement of default disputes involving online lending debtors also demonstrate that the substance of the agreement, rather than merely the validity of the medium through which it is formed, is a crucial issue in online lending civil disputes (Kiswah et al., 2025). Meanwhile, a study on legal certainty in electronic contracts for online lending under the law of obligations indicates that legal certainty can only be achieved when all requirements for a valid agreement, rather than merely consent and capacity, are comprehensively examined (Martinelli et al., 2024). Therefore, provider verification and legality are not merely technical issues specific to online lending in Indonesia. They constitute broader challenges in addressing the

convenience of digital contracts. Recognition of the validity of the electronic medium alone is insufficient to ensure the validity of the agreement as a whole.

Another aspect relevant to the application of this three-regulation framework is the role of verification instruments, such as one-time passwords (OTPs) and biometric authentication, in online lending practices. These instruments strengthen user identity authentication in electronic transactions (Simamora et al., 2025). However, their evidentiary strength does not automatically resolve the substantive issue of the debtor's legal capacity, much less the issue of lawful cause.

Similarly, studies of exoneration clauses in online lending agreements show that providers commonly include clauses that transfer liability and may conflict with the principle of good faith, even when the electronic consent process satisfies the applicable technical requirements (Nurhilmiyah & Purba, 2022). This also demonstrates that strengthening the validity of digital online lending agreements should not rely solely on electronic verification instruments. It should also be accompanied by stronger mechanisms for examining the substance of agreements. Such mechanisms should address issues of lawful cause more adequately than merely examining the validity of electronic signatures (Farhan & Kafi, 2023).

This interpretation is further supported by the principle that good faith, as provided in Article 1338 paragraph (3) of the Indonesian Civil Code, must be understood as applying throughout the formation of an agreement, rather than solely during its performance (Hidayah, 2021). This principle requires the convenience of digital contract formation to be interpreted beyond the literal fulfillment of electronic consent alone. It should instead be interpreted more broadly to include the quality of the resulting consent, including the need to provide users with clear information concerning the substance of the agreement. Under this interpretation, a provider's failure to ensure the debtor's legal capacity or the legality of its own business activities may be considered a failure to satisfy the requirements for a valid agreement under Article 1320 of the Indonesian Civil Code. This may apply even where electronic consent has been formally provided and recorded in accordance with Articles 5, 6, and 11 of Law No. 1 of 2024.

The adequacy of the norms governing the validity of digital online lending agreements cannot be assessed solely based on the existence of Articles 5, 6, and 11 of Law No. 1 of 2024, which recognize the validity of electronic media. Such adequacy must be assessed based on the ability of these norms to address the provider's capacity in practice. This is demonstrated by the gap in electronic signature verification in practice. It must also ensure that the lawful cause of the funding agreement is genuinely examined through providers' compliance with POJK No. 40 of 2024. This examination should not depend solely on the smoothness of the electronic consent process (Syaiful & Sugiyono, 2024).

Accordingly, strengthening the validity of digital online lending agreements should be directed toward an interpretation that positions Article 1320 of the Indonesian Civil Code as a two-dimensional validity framework. The formal dimension is reinforced by electronic verification instruments, while the substantive dimension is reinforced by providers' compliance with the licensing and governance requirements under POJK No. 40 of 2024. This approach should be accompanied by stronger supervisory mechanisms to ensure that both dimensions are satisfied simultaneously, in line with the needs identified in studies concerning equitable and legally certain legal protection for online lending consumers (Putra & Waluyo, 2023).

Discussion

Overall, the findings of this research confirm that the validity of digital online lending agreements cannot be synthesized as a single issue. Rather, it must be examined through two complementary dimensions within a hierarchical framework comprising Article 1320 of the Indonesian Civil Code, Articles 5, 6, and 11 of Law No. 1 of 2024, and POJK No. 40 of 2024. The formal dimension, particularly consent and certain aspects of capacity, has received strong normative recognition through electronic media. Meanwhile, the substantive dimension, particularly the actual capacity of the provider and the existence of a lawful cause, can only be examined through the provider's compliance with POJK No. 40 of 2024. This synthesis is consistent with the principle that a specific provision must operate within the same legal regime as the general provision that it particularizes. It is further supported by data showing that, among 102 OJK-licensed fintech lending providers, only seven actually verified their users' electronic signatures. The partial congruence among the three regulations provides the central thread explaining why the validity of online lending agreements cannot be assessed through a single dimension alone.

Consistent with the line of argument developed in the Introduction, the findings of this research are generally consistent with the study by (Mulyadi et al., 2024), which concluded that online lending agreements satisfy the requirements for a valid agreement under Article 1320 of the Indonesian Civil Code and are therefore legally binding upon the parties. The consistency lies in positioning Article 1320 of the Indonesian Civil Code as the primary basis for examining validity and recognizing that consent may be validly formed through an electronic medium, as reinforced by Law No. 1 of 2024. This consistency demonstrates that the findings of this research do not reject the conclusion of (Mulyadi et al., 2024). Instead, they clarify the scope of that conclusion through the proposed two-dimensional framework.

In contrast, the findings of this research differ at the level of conclusion from (Nicholas, 2025), who examined the position of illegal online lending providers as creditors in bankruptcy proceedings, although both studies rely on Article 1320 of the Indonesian Civil Code. (Nicholas, 2025) concluded that a violation of the capacity requirement by an OJK-unlicensed provider constitutes a violation of a subjective requirement. Accordingly, the illegal online lending agreement may be annulled. This research goes further by arguing that the issue does not end with the possibility of annulment. Rather, it reflects a broader failure to satisfy the substantive dimension, both with respect to the provider's capacity and the lawful-cause requirement. Both requirements should constitute cumulative prerequisites for contractual validity, rather than merely grounds for annulment that depend on an injured party's initiative.

From a theoretical perspective, this research contributes by refining the framework for examining the requirements for a valid agreement under Article 1320 of the Indonesian Civil Code in the context of electronic contracts. The framework shifts from a flat examination of four requirements to a two-dimensional framework consisting of formal validity and substantive validity. These dimensions are interdependent but rely on different mechanisms of examination. This contribution expands the prevailing approach, which has largely focused on the consistency between the parties' expressed intentions and their internal intentions, as developed through the Wilstheorie in electronic e-commerce contracts (Handayani et al., 2024). The proposed framework adds the capacity and legality of the provider as equally important elements. It also enriches the discourse on digital constitutionalism in banking law, which emphasizes the need to balance convenient access to digital

financial services with guarantees for the protection of users' rights (Kurniawan & Putri, 2022). The framework provides a concrete normative instrument through a mapping of consistency among regulatory provisions, which can be used to examine this balance operationally rather than merely conceptually.

From a practical perspective, these findings have direct implications for online lending service providers and debtors. For providers, the low level of electronic-signature verification in practice and variations in the effectiveness of authentication safeguards among providers indicate that formal compliance with Law No. 1 of 2024 should not be used to justify neglecting substantive verification mechanisms. Field data showing that 20 fintech lending companies had a 90-day default rate (TWP90) above five percent also indicate that weaknesses in substantive examination at the contract-formation stage may be associated with default risks during the performance stage. For debtors, findings concerning the exoneration clauses commonly included by online lending providers underscore the importance of recognizing that electronic consent does not automatically guarantee full protection of debtors' substantive rights. Therefore, strengthening digital legal literacy constitutes a practical need that cannot be overlooked.

From a policy perspective, this research recommends that the Financial Services Authority (OJK) strengthen its mechanisms for supervising providers' compliance with POJK No. 40 of 2024 on a regular basis. Such supervision should not be limited to the initial licensing stage but should also cover the continuous implementation of identity and electronic-signature verification. This recommendation is consistent with the substantial verification gap identified in practice. It also includes the need for further harmonization between standard-form clauses in online lending credit agreements and the principle of good faith. Studies concerning the role of standard-form clauses indicate that issues involving the misuse of funds by debtors or providers cannot be resolved solely through regulation of clause formats. Stronger mechanisms for resolving default disputes are also required. Such mechanisms should focus on the substance of the agreement rather than merely the validity of the medium through which it was formed. This policy strengthening is important to ensure that the hierarchical approach involving the Indonesian Civil Code, Law No. 1 of 2024, and POJK No. 40 of 2024 does not remain merely a normative framework on paper. Instead, it should operate as an effective instrument for ensuring legal certainty and protecting the rights of parties to digital online lending agreements.

CONCLUSION

This research concludes that the validity of digital agreements in online lending cannot be determined solely by the formation of electronic consent. Instead, it must be comprehensively examined based on all four requirements under Article 1320 of the Indonesian Civil Code. Electronic mechanisms provide an adequate basis for formal validity, particularly through the recognition of electronic information, electronic documents, and electronic signatures under Law No. 1 of 2024. However, substantive validity remains contingent upon the capacity of the parties and the existence of a lawful cause, including the provider's legality and compliance with POJK No. 40 of 2024. Accordingly, the convenience of digital contract formation does not reduce the standard of contractual validity under Indonesian civil law.

The main findings of this research address the research gap concerning differing assessments of the validity of online lending agreements, which have previously tended to focus on the formation of

consent or defects in the provider's capacity. The novelty of this research lies in positioning the validity of digital agreements within two dimensions: formal and substantive validity, as well as mapping the hierarchical relationship among Article 1320 of the Indonesian Civil Code, Law No. 1 of 2024, and POJK No. 40 of 2024. This framework demonstrates that the three regulations have complementary functions but are not fully congruent. The Electronic Information and Transactions Law primarily supports the validity of the electronic medium, whereas the POJK provides more operational instruments for examining the provider's legality and the fulfillment of substantive requirements.

Theoretically, this research extends the application of Article 1320 of the Indonesian Civil Code to electronic contracts by demonstrating that validity should not be understood merely as a formal examination of four requirements. Instead, it should be understood as a relationship between formal and substantive dimensions that employ different examination instruments. Practically, these findings emphasize that providers must not only ensure the validity of electronic consent but also ensure substantive verification and compliance. Debtors, meanwhile, need to understand that electronic consent does not, by itself, guarantee the fulfillment of all aspects of contractual validity. This research demonstrates that legal certainty in online lending does not arise solely from the speed and validity of the technology used. Rather, it depends on the law's ability to ensure that digital convenience operates together with substantive validity and protection of the interests of the parties.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

ACKNOWLEDGMENT

The author would like to express sincere gratitude to all parties who contributed to the completion of this research, particularly those who provided academic guidance, constructive feedback, and support throughout the research process.

USE OF ARTIFICIAL INTELLIGENCE (AI)-ASSISTED TECHNOLOGY

The authors declare that no artificial intelligence (AI) tools were used in the preparation, analysis, or writing of this manuscript. All aspects of the research, including data collection, interpretation, and manuscript preparation, were carried out entirely by the authors without the assistance of AI-based technologies.

REFERENCES

Ali, Z. (2009). *Metode Penelitian Hukum*. Sinar Grafika.

Anastasia, D. S. (2023). Urgensi Pembentukan Hukum Fintech Untuk Memberi Perlindungan Hukum Kepada Konsumen Dalam Pinjaman Online. *Jurnal Hukum dan HAM Wara Sains*, *2*(2), 136–151. https://doi.org/10.58812/jhhws.v2i02.227

Andayani, T. A. (2025). Pengawasan Transaksi Pinjaman Online Oleh Otoritas Jasa Keuangan (OJK) Berdasarkan POJK Nomor 77/POJK.01/2016 Tentang Layanan Pinjam Meminjam Uang Berbasis Teknologi Informasi. *Consensus : Jurnal Ilmu Hukum: Jurnal Ilmu Hukum*, *4*(1), 29–38. https://doi.org/10.46839/consensus.v4i1.1454

Falaq, M. R. I., & Multazam, M. T. (2024). Pentingnya Sertifikasi Tanda Tangan Elektronik pada Pinjaman Online. *Journal Customary Law*, *1*(3), 1–9. https://doi.org/10.47134/jcl.v1i3.2957

Farhan, I. A., & Kafi, M. S. (2023). Peranan Pelaksanaan Asas Iktikad Baik dalam Hukum Perjanjian. *JIRS*, *1*(2), 532–538. https://doi.org/10.61722/jirs.v1i2.391

Firdaus, R. M. F., Noerzein, A., & Wafa, E. A. (2022). Legalitas Tanda Tangan Elektronik sebagai Bentuk Otoritas dalam Perjanjian Kredit Perbankan. *Jurnal MAHUPAS: Mahasiswa Hukum Unpas*, *1*(2), 31–48.

Gunawan, A., Zuhrah, & Didik, I. (2025). Tinjauan Yuridis Perlindungan Hukum Bagi Konsumen Pinjaman Online di Indonesia. *As-Syar ' i: Jurnal Bimbingan & Konseling Keluarga*, *7*(4), 228–242. https://doi.org/10.47476/assyari.v7i4.9449

Guspitawaty, E., & Santiago, F. (2023). Responsibility ff The Notary to The Parties in Terms of Binding Purchase Agreement (PPJB) Based on Their Legal Analysis No Title. *Journal of World Science*, *2*(4), 508–512. https://doi.org/10.58344/jws.v2i4.278

Handayani, P., Arianto, D., & Sazani. (2024). Legality of Electronic Contracts in the Context of Good Faith Principle Application in E-Commerce Transactions within the Modern Economy: A Review Based on Wilstheorie. *DiH: Jurnal Ilmu Hukum*, *20*(2), 211–218. https://doi.org/10.30996/dih.v20i2.11509

Hartati, R., & Syafrida. (2022). Perlindungan Hukum Konsumen Nasabah Pinjaman Online Ilegal (Pinjol Ilegal). *Otentik's: Jurnal Hukum Kenotariatan*, *4*(2), 167–185. https://doi.org/10.35814/otentik.v4i2.3737

Hermawan, R. O., Adolf, H., & Santoso, E. (2024). Kajian Hukum Penerapan Pasal dalam Kontrak Elektronik. *Iustitia Omnibus: Jurnal Ilmu Hukum*, *5*(2), 141–164. https://doi.org/10.70825/iustitia.v5i2.100

Hidayah, A. (2021). Asas Iktikad Baik dalam Kontrak Elektronik. *Solusi*, *19*(2), 155-164 ASAS. https://doi.org/10.36546/solusi.v19i2.361

Hidayatulloh, T. N., & Arifin, T. (2026). Pinjaman Online dalam Perspektif Pasal 1320 KUHPerdata dan Hadits Riwayat Imam Bukhori No.2085 dan Imam Muslim No.1598. *Journal of Literature Review*, *1*(1), 227–238. https://doi.org/10.63822/bf910z28

Irianto, S. (2024). Validity of Contracts in the Digital Era in Indonesia. *International Journal of Religion*, *5*(11), 5808–5817. https://doi.org/10.61707/7q34h809

Khaerunnisa, R. (2025). *OJK: Ada 20 perusahaan "fintech lending" dengan TWP90 di atas 5 persen*. ANTARA. https://m.antaranews.com/amp/berita/4779685/ojk-ada-20-perusahaan-fintech-lending-dengan-twp90-di-atas-5-persen

Kiswah, M., Wibisono, W. F. R., Setyawan, F., & Adonara, F. F. (2025). Keabsahan Perjanjian Elektronik dan Penyelesaian Sengketa Wanprestasi Debitur Pinjaman Online. *Jurnal Magister Hukum Perspektif*, *16*(2), 89–106. https://doi.org/10.37303/magister.v16i2.128

Kurniawan, N., & Putri, M. C. (2022). DIGITAL CONSTITUTIONALISM ERA IN THE DEVELOPMENT OF BANKING LAW IN INDONESIA. *Journal of Central Banking Law and Institutions*, *1*(3), 431–454.

https://doi.org/10.21098/jcli.v1i3.29

Lermansyah, A., Astanti, D. I., & Heryanti, B. R. (2023). Perlindungan Hukum Bagi Konsumen dalam Jasa Layanan Keuangan (Digital Financial Technology). *Semarang Law Review (SLR)*, *4*(1), 51–59. https://doi.org/10.26623/slr.v4i1.6590

Lubis, M. A., & Putra, M. F. M. (2022). Peer To Peer (P2P) Lending : Hubungan Hukum Peer To Peer (P2P) Lending : Legal Relationship of Parties , Risk of Default , and Legality Banyaknya masyarakat Indonesia yang menggunakan jasa P2P Lending menyebabkan berkembang pesatnya industri ini dan p. *JURNAL USM LAW REVIEW*, *5*(1), 188–204. https://doi.org/10.26623/julr.v5i1.4896

Martinelli, I., Sugiawan, F. A., & Zulianty, R. (2024). Kepastian Hukum Kontrak Elektronik Dalam Pinjaman Online Berdasarkan Hukum Perikatan. *JAMPARING: Jurnal Akuntansi Manajemen Pariwisata dan Pembelajaran Konseling*, *2*(2), 537–543. https://doi.org/10.57235/jamparing.v2i2.2922

Marzuki, P. M. (2013). *Penelitian Hukum*. Kencana Prenada Media Grup.

Mulyadi, Y., Aziz, H., & Myranika, A. (2024). Perlindungan Hukum Terhadap Nasabah Pinjaman Online Dikaitkan dengan Pasal 1320 KUHPerdata Tentang Keabsahan Perjanjian Kontrak. *Jurnal Pemandhu*, *5*(1), 69–85.

Nasrullah, Hidayah, Y., & Machmud, A. (2025). Penerapan Asas Lex Specialis Derogat Legi Generali dalam Penetapan Tanggal Efektif Akuisisi: Studi Kasus Putusan KPPU No. 02/KPPU-M/2018. *Jurnal Ilmu Hukum, Humaniora dan Politik (JIHHP)*, *6*(1), 327–341. https://doi.org/10.38035/jihhp.v6i1.6036

Nicholas, J. (2025). Keabsahan Perjanjian dan Kedudukan Pinjaman Online Illegal sebagai Kreditur dalam Kepailitan. *The Juris*, *9*(1), 57–66. https://doi.org/10.56301/juris.v9i1.1568

Nurhilmiyah, & Purba, H. (2022). Klausula Eksonerasi Pada Perjanjian Pinjaman Online Nurhilmiyah1,. *Acta Law Journal*, *1*(1), 25–32. https://doi.org/10.32734/alj.v1i1.10014

Nurhisyam, F., Sudiro, A. A., & Machmud, A. (2024). Analisis Penerapan Kode Etik Penagihan Pada Fintech P2P Lending Dalam Perspektif Perlindungan Konsumen. *Journal Syntax Idea*, *6*(2), 888–899. https://doi.org/10.46799/syntax-idea.v6i2.3013

Nurmawanadilah, D. (2024). Kekuatan Pembuktian Tanda Tangan Elektronik dalam Suatu Kontrak Individual. *Maliki Interdisciplinary Journal (MIJ)*, *2*(6), 1490–1497.

Putra, A. H., & Waluyo. (2023). Perlindungan Hukum Terhadap Konsumen Pinjaman Online Berkeadilan dan Kepastian Hukum. *Jurnal Hukum dan Pembangunan Ekonomi*, *11*(1), 118–129. https://doi.org/10.20961/hpe.v11i1.68284

Risal, A. (2024). Legal Protection for Debtors in Online Transactions: Evaluating Safeguards in E-Commerce. *Jurnal Hukum Bisnis Bonum Commune*, *7*(2), 176–187. https://doi.org/10.30996/jhbbc.v7i2.11656

Senda, V. N., Sopiani, S., & Muzzamil, M. F. (2024). Implikasi Hukum Ketidakterpenuhan Syarat Subjektif dalam Pasal 1320 Kitab Undang-Undang Hukum Perdata terhadap Keabsahan Perjanjian. *LETTERLIJK*, *1*(2), 104–115. https://doi.org/10.25134/letterlijk.v1i2.109

Septiari, N. L. G. M., & Ujianti, N. M. P. (2025). Kekuatan Hukum Perjanjian Elektronik dalam Perspektif KUH Perdata dan UU ITE. *Indonesian Journal of Law and Justice*, *2*(4), 1–10. https://doi.org/10.47134/ijlj.v2i4.4320

Simamora, P. N. S., Ginting, G., Rantung, C. M. M., Kaunang, P. D., & Dewi, P. M. (2025). Legal Implications of Electronic Contracts in Civil Law: A Case Study in the Digital Era. *Jurnal Smart Hukum (JSH)*, *3*(3), 224–232. https://doi.org/10.55299/jsh.v3i3.1272

Soekanto, S., & Mamudji, S. (2015). *Penelitian Hukum Normatis Suatu Tinjauan Singkat*. Raja Grafindo Persada.

Sukma, S. (2025). Legalitas Tanda Tangan Digital Dalam Konteks Perjanjian. *Nomos: Jurnal Penelitian Ilmu Hukum*, *5*(2), 220–230. https://doi.org/10.56393/nomos.v5i2.2705

Sulistyaningrum, H. P. (2024). E-contract Consensus in Indonesian Contract Law. *Batulis Civil Law Review*, *5*(2), 89–98. https://doi.org/10.47268/ballrev.v5i2.1930

Suyadi, Wiwiek, Y. H., Sulistyandari, Muksinun, & Sukirman. (2022). Kosmik Hukum. *Kosmik Hukum*, *22*(3), 205–211. https://doi.org/10.30595/kosmikhukum.v21i3.13142

Syaiful, R. D., & Sugiyono, H. (2024). Misuse of Consumer Personal Data Through Illegal Fintech Peer To Peer Lending. *JUSTISI*, *10*(1), 189–201. https://doi.org/10.33506/js.v10i1.3003

Vebriani, S., & Danyathi, A. P. L. (2025). Keabsahan Hukum Perjanjian Jual Beli Melalui E-Commerce di Indonesia: Perlindungan Konsumen dan UU ITE. *Jurnal Kertha Desa*, *13*(10), 1008–1020.

Wafda, A. T. K., & Setyowati, R. (2022). Implementation of the Principle of Good Faith in the Sharia Financial Technology Contract of PT. Qazwa Mitra Hasanah. *International Journal of Social Science And Human Research*, *05*(10), 4780–4784. https://doi.org/10.47191/ijsshr/v5-i10-52

Zulkifli, Karmilia, R., & Nofrizal. (2025). Aspek Hukum Transaksi Elektronik pada Digital Banking dan Financial Technology. *Andrew Law Journal*, *4*(1), 369–375. https://doi.org/10.61876/alj.v4i1.158

Authors Bio*

Wahid Ihsanuddin, Faculty of Law, Sultan Ageng Tirtayasa University, Civil Law, and Email: wahidihsanuddin@gmail.com
Erna Rahma Balgis, Faculty of Law, Trisakti University, Civil Law, and Email: ernarahma93@gmail.com
Zhang Liangfei, North Henan Medical University, Business Administration, Email: 925358903@qq.com, and Orcid: 0009-0001-2380-6715