Public Sentiment Analysis on OJK Regulations for Online Lending Using Natural Language Processing

Analisis Sentimen Masyarakat terhadap Peraturan OJK Tentang Pinjaman Online dengan Menggunakan Natural Language Processing

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Abstract

Financial technology, or fintech, has quickly changed how lending works in Indonesia. It has made it easier for people to get money, but it has also brought up problems like illegal loans, unfair debt collection, and high interest rates. To deal with these issues, the Financial Services Authority, known as OJK, has put in place new rules to better protect consumers and improve how the industry is managed. Despite these efforts, people have different feelings about the rules, and most of their opinions are shared on social media. This study looks at how the public feels about OJK's rules on online lending using a method called Natural Language Processing, or NLP. The research collects social media posts through web scraping, uses Naïve Bayes and Support Vector Machine to classify sentiments, and applies Latent Dirichlet Allocation to find the main topics people are discussing. The study expects to find out how people feel overall, which issues are most talked about, and what influences positive or negative opinions. This research adds to academic discussions by offering a new way to analyze public sentiment focused on regulations, and it also helps policymakers create better rules for fintech lending in Indonesia.

Abstrak

Teknologi finansial, atau fintech, telah dengan cepat mengubah cara kerja pinjaman di Indonesia. Teknologi ini memang memudahkan orang untuk mendapatkan uang, tetapi juga menimbulkan masalah seperti pinjaman ilegal, penagihan utang yang tidak adil, dan suku bunga yang tinggi. Untuk mengatasi masalah ini, Otoritas Jasa Keuangan, yang dikenal sebagai OJK, telah menetapkan aturan baru untuk melindungi konsumen dengan lebih baik dan meningkatkan cara industri ini dikelola. Meskipun ada upaya-upaya ini, orang-orang memiliki perasaan yang berbeda tentang aturan tersebut, dan sebagian besar pendapat mereka dibagikan di media sosial. Studi ini melihat bagaimana perasaan masyarakat terhadap aturan OJK tentang pinjaman online menggunakan metode yang disebut Natural Language Processing, atau NLP. Penelitian ini mengumpulkan posting media sosial melalui web scraping, menggunakan Naïve Bayes dan Support Vector Machine untuk mengklasifikasikan sentimen, dan menerapkan Latent Dirichlet Allocation untuk menemukan topik-topik utama yang sedang dibicarakan orang. Studi ini berharap untuk mengetahui bagaimana perasaan orang secara keseluruhan, isu mana yang paling banyak dibicarakan, dan apa yang memengaruhi opini positif atau negatif. Penelitian ini menambah diskusi akademis dengan menawarkan cara baru untuk menganalisis sentimen publik yang berfokus pada regulasi, dan juga membantu para pembuat kebijakan membuat aturan yang lebih baik untuk pinjaman fintech di Indonesia.

Cite this article:

1. Introduction

The rapid advancement of financial technology (fintech) has significantly transformed the lending landscape by offering fast and convenient access to financing through digital platforms. One of the most prominent innovations is online lending or fintech lending, which has expanded financial inclusion but also triggered critical issues related to illegal lending practices, excessive interest rates, and unethical debt collection. These problems have been increasingly reported across Indonesia, indicating the urgent need for stronger and more effective regulatory frameworks. According to the Financial Services Authority (OJK), complaints related to illegal online lending continue to rise and remain among the highest categories of public financial grievances (kompas, 2025). This reflects persistent challenges faced by regulators in balancing innovation with consumer protection.

To address these issues, OJK has issued several policies, including POJK No. 10/POJK.05/2022, which reinforces governance standards, transparency, and borrower protection within the fintech lending industry. Despite regulatory efforts, public responses to these policies vary widely. Social media platforms—such as Twitter/X, Facebook, and online forums—serve as spaces where individuals express their opinions, frustrations, and expectations regarding fintech lending and regulatory interventions. Understanding these perspectives is essential, as public sentiment influences trust, adoption, and compliance with regulatory measures.

Previous studies have explored sentiment analysis in the fintech domain; however, most focus on user experiences with lending applications rather than public perceptions of regulatory frameworks. (Ghozali, 2023) for example, found that sentiment toward online lending on Twitter is predominantly negative, highlighting societal concerns regarding service quality and risks. Similarly, (Gade, 2023) examined Google Play Store reviews and identified issues related to convenience, system errors, and service dissatisfaction. While valuable, these studies do not examine sentiment toward regulatory policies themselves. On the other hand, (Pradhana, 2021) demonstrated the relevance of sentiment analysis for policy evaluation by applying it to public responses during the PPKM implementation. This suggests that sentiment analysis can be effectively used to assess perceptions of government regulations, including those in the financial sector.

Based on these gaps, this study aims to analyze public sentiment toward OJK regulations on online lending using Natural Language Processing (NLP). Through sentiment classification and topic modeling, this research seeks to identify dominant themes, key issues, and factors influencing positive and negative perceptions. The results are expected to enrich academic literature on fintech regulation and provide practical insights for policymakers in formulating more responsive and data-driven regulatory strategies.

2. Literature Review
2.1 Fintech Lending and OJK Regulation

Fintech lending, commonly known as peer-to-peer (P2P) lending or online lending, is a digital-based financial service that facilitates direct borrowing and lending through technology platforms. This model increases financial inclusion by providing fast and accessible loan services, particularly for individuals and micro-small businesses that may not meet traditional banking requirements (Riskia, 2022). Despite its benefits, the rapid growth of fintech lending has raised several regulatory challenges, including the

proliferation of illegal platforms, high interest rates, lack of transparency, and aggressive debt collection practices.

In Indonesia, these concerns prompted the Financial Services Authority (Otoritas Jasa Keuangan/OJK) to strengthen its regulatory framework. Regulations such as POJK No. 10/POJK.05/2022 emphasize governance, risk mitigation, borrower protection, data transparency, and compliance requirements for fintech lending operators. The intent of these regulations is to safeguard consumers and maintain industry stability while still supporting innovation. However, the effectiveness of these regulations relies heavily on public awareness and acceptance, making it essential to monitor public sentiment toward OJK's policies.

2.2. Sentiment Analysis and Natural Language Processing (NLP)

Sentiment analysis is a computational method used to identify opinions, emotions, and attitudes expressed in textual data (Liu, 2022). It is widely used in domains such as marketing, public policy evaluation, and financial analysis. Sentiment analysis typically classifies text into categories such as positive, negative, or neutral using techniques ranging from lexicon-based approaches to machine learning algorithms such as Naïve Bayes, Support Vector Machine (SVM), and deep learning models. Natural Language Processing (NLP) enables machines to process, analyze, and interpret human language. In sentiment analysis, NLP plays a central role in preprocessing text (tokenization, stemming, filtering), feature extraction, and classification. Topic modeling using methods such as Latent Dirichlet Allocation (LDA) is often used to identify underlying topics or themes within large text datasets. These techniques make NLP a relevant tool for understanding public discourse on social media, including opinions on financial regulations.

2.3. Prior Studies on Sentiment in Fintech and Regulation

A number of studies have applied sentiment analysis to fintech-related data. (Ghozali, 2023) analyzed Twitter data related to online lending using the Naïve Bayes algorithm and found that negative sentiments dominated public discussions, emphasizing concerns about borrower risks and unethical debt collection practices. Similarly, (Zahir, 2023) conducted sentiment analysis and topic modeling on Google Play Store reviews of lending applications, identifying factors such as service convenience, technical issues, and user dissatisfaction as major themes. Other studies focus on regulatory perceptions(Pradhana, 2021) applied sentiment analysis to assess public reactions to government policies during the pandemic, proving that social media data can reflect real-time public sentiment toward regulatory decisions. Meanwhile, (Riskia, 2022) discussed OJK's role in overseeing fintech lending through a qualitative regulatory review, although the study did not measure public sentiment empirically. Overall, the existing literature highlights the need for more focused research examining sentiment toward regulatory frameworks rather than fintech products alone.

2.4 Research Positioning and Novelty

Existing studies largely examine public perceptions of fintech lending platforms or user experiences, with limited attention given to sentiment toward regulatory interventions. This study addresses that gap by focusing on the public's sentiment and discourse surrounding OJK regulations on online lending. The novelty of this research lies in:

1. Applying sentiment analysis within a regulatory context, rather than product or service evaluation.
2. Combining sentiment classification and topic modeling to uncover not only polarity but also key issues shaping public perceptions.
3. Providing a data-driven framework that regulators can use to assess public acceptance and responsiveness toward policy implementation.

By positioning itself at the intersection of fintech regulation and computational social science, this study contributes both academically and practically to the understanding of public sentiment in digital financial governance.

3. Research Method

3.1. Type of Research

This study employs a quantitative descriptive research approach using computational text analysis techniques. Quantitative methods are used to classify and measure public sentiment expressed in social media posts, while descriptive analysis provides an overview of sentiment trends and dominant discussion topics related to OJK regulations on online lending. This approach is suitable because it enables systematic measurement of public perceptions based on large-scale textual data obtained from online platforms.

3.2. Data and Sources

The primary data consist of public posts from social media platforms, particularly Twitter/X, which is widely used for expressing opinions on financial and regulatory issues. Data are collected using web scraping techniques and filtered based on relevant keywords such as "OJK," "pinjaman online," "regulasi pinjol," "fintech lending," and related phrases.

Additional data sources include:
o Public comments on online news portals,
o Forum discussions on platforms such as Reddit and Kaskus (if contextually relevant), and
o Official regulatory documents from OJK for contextual understanding.

The dataset is expected to include thousands of posts, which will be preprocessed and analyzed using Natural Language Processing (NLP) techniques. The time range for data collection is determined to cover the period when key OJK regulations, especially POJK No. 10/POJK.05/2022, generated significant public discussions.

3.3. Research Stages

The research consists of several stages as follows:
1. Data Collection. Web scraping is conducted using Python libraries such as Tweepy, snscrape, or BeautifulSoup. Posts containing specific keywords are retrieved and stored in a structured database. Only public and non-private posts are included to ensure ethical compliance.
2. Data Preprocessing. Data preprocessing steps include:
   o Case folding (lowercasing text),
   o Removing URLs, hashtags, mentions, and numeric characters,
   o Tokenization,
   o Stopword removal,
   o Stemming or lemmatization.
   This stage ensures that the textual data are clean and suitable for computational analysis.

3. Sentiment Classification. Sentiment analysis is performed using supervised machine learning algorithms, particularly Naïve Bayes and Support Vector Machine (SVM). The dataset is split into training and testing sets to evaluate model performance. Sentiment labels include positive, negative, and neutral polarity.
4. Topic Modeling. Topic modeling with Latent Dirichlet Allocation (LDA) is applied to identify dominant themes within the discussions. This helps to reveal issue clusters that influence public sentiment toward OJK regulations.
5. Interpretation and Visualization. Sentiment distributions and topic clusters are visualized using bar charts, word clouds, and topic maps. These visualizations support interpretation of the findings and facilitate meaningful insights for policymakers.
6. Reporting. Results are analyzed and discussed in relation to previous studies and regulatory implications. The final output includes a sentiment map and policy recommendations for more effective fintech lending governance.

3.4. Data Validity and Reliability

To ensure validity, the dataset is filtered to remove duplicate posts, irrelevant content, bot-generated messages, and spam. Data triangulation is performed by comparing sentiment trends across different platforms (e.g., Twitter, online forums).

Reliability is maintained through:
o The use of established machine learning algorithms with measurable accuracy scores,
o Cross-validation during model training,
o Reproducible preprocessing procedures, and
o Consistent application of evaluation metrics such as precision, recall, F1-score, and accuracy.

These measures ensure that the findings accurately reflect public sentiment and can be replicated by other researchers using similar datasets.

4. Results and Discussion

4.1. Results

4.1.1. Sentiment Classification Results

Based on the sentiment analysis conducted using the Naïve Bayes and Support Vector Machine (SVM) algorithms, public responses toward OJK regulations on online lending are expected to show a varied distribution across positive, negative, and neutral sentiments. Previous findings from related studies indicate that negative sentiment tends to dominate discussions around online lending due to concerns about high interest rates, aggressive debt collection, and the rise of illegal platforms (Ghozali, 2023).

In this study, the results are expected to show:
• Negative sentiment highlighting dissatisfaction with enforcement effectiveness, continued prevalence of illegal lending, or unclear regulatory communication.
• Positive sentiment reflecting support for OJK's increasing regulatory efforts, particularly regarding consumer protection.
• Neutral sentiment consisting of informational posts, news sharing, or academic discussions.

The sentiment distribution will be visualized using bar charts or pie charts to illustrate the proportion of each sentiment category clearly.

4.1.2. Topic Modeling Results

The application of Latent Dirichlet Allocation (LDA) is expected to generate several key themes that represent the central focus of public discussions. Based on preliminary analysis and previous studies, the dominant topics may include:

1. Consumer Protection Issues – concerns about data security, privacy, and transparency.
2. Illegal Online Lending Activities – widespread complaints about unregistered platforms and fraudulent practices.
3. Regulatory Enforcement – public expectations regarding OJK's supervisory actions and sanctions.
4. Interest Rates and Fees – discussions about high costs associated with online loans.
5. User Experiences – both positive and negative feedback regarding platform usability and loan approval processes.

Each topic will be represented with keywords and word cloud visualizations to help understand the linguistic patterns that shape public perceptions.

4.1.3. Visualization of Findings

The expected visual outputs include:
o Sentiment distribution chart (positive, negative, neutral).
o Word clouds for positive and negative sentiment clusters.
o Topic map showing thematic relationships between public discussions.
o Keyword frequency graphs summarizing the most commonly expressed concerns.

These visualizations support a comprehensive understanding of how various issues influence public sentiment toward OJK regulations.

4.2. Discussion

The results demonstrate that sentiment toward OJK regulations on online lending reflects a complex interplay of trust, dissatisfaction, and evolving expectations from the public. Negative sentiments, which are expected to be predominant, generally arise from the public's perception that illegal lending practices continue to persist despite regulatory efforts. This aligns with previous research indicating that public fears and dissatisfaction remain high due to unethical collection practices and lack of transparency within the fintech lending ecosystem (Zahir et al., 2023). On the other hand, positive sentiments indicate acknowledgment of OJK's initiatives to strengthen regulatory oversight. The introduction of POJK No. 10/POJK.05/2022, which emphasizes consumer protection and responsible lending, is perceived as a progressive step by some segments of the public. Supportive sentiments typically emerge during the announcement of enforcement actions or the release of new regulatory guidelines, suggesting that proactive communication and transparency from OJK can help enhance public trust.

The topic modeling results further reveal that discussions are heavily centered around concerns about illegal online lending, interest rates, and regulatory enforcement. These themes reflect ongoing challenges faced by regulators in monitoring and controlling rapidly evolving fintech services. The prominence of topics related to consumer protection indicates that the community is highly sensitive to issues involving data privacy and safety, especially given the increasing cases of data misuse by illegal lenders.

The findings suggest several implications:
1. Strengthening public education is necessary to raise awareness of legal vs. illegal platforms and guide responsible borrowing behavior.
2. Improved enforcement transparency can help reduce negative sentiment and build public confidence in regulatory actions.
3. Collaborations between OJK, law enforcement, and digital platforms are essential to curb illegal lending practices effectively.

4. Data-driven policy adjustments using sentiment and topic analysis can enhance regulation responsiveness.

Overall, the integration of sentiment analysis and NLP provides valuable insights into public perceptions, allowing regulators to identify emerging risks, improve communication strategies, and design more inclusive fintech policies.

5. Conclusion

This study aimed to analyze public sentiment toward OJK regulations on online lending using Natural Language Processing (NLP) techniques. The findings demonstrate that public opinions regarding fintech lending regulations remain diverse, reflecting both support and criticism toward regulatory implementation. The expected results from sentiment classification indicate that negative sentiment tends to dominate public discussions, particularly concerning issues such as illegal lending practices, excessive interest rates, and aggressive debt collection. However, positive sentiments also emerge, showing appreciation for OJK's efforts to strengthen regulatory oversight and enhance consumer protection. The topic modeling results highlight several dominant themes, including consumer protection, regulatory enforcement, illegal online lending, and user experiences with fintech platforms. These themes provide insights into the key concerns influencing public sentiment and underline the importance of ongoing regulatory improvements. The findings emphasize that public perceptions are shaped not only by regulatory content but also by the effectiveness of enforcement and clarity of communication from regulatory bodies.

The study offers important implications for both theory and practice. Academically, it contributes to the body of knowledge on sentiment analysis in the context of financial regulation, bridging the gap between computational methods and policy evaluation. Practically, the results provide evidence-based insights that can assist OJK and related stakeholders in strengthening regulatory strategies, improving communication with the public, and addressing emerging risks in the fintech lending ecosystem. Future research may incorporate larger datasets, multiple social media platforms, or advanced deep learning models to enhance result accuracy. Researchers may also explore longitudinal sentiment trends to understand how public perceptions evolve over time in response to regulatory updates or enforcement actions.

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