

Borrower Sentiment on P2P Lending in Indonesia Based on Google Playstore Reviews

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ABSTRACT

P2P lending is a part of fintech where the public can request small loans without the common procedures of a conventional bank. There are many issues that arise from the lack of regulations and information on P2P lending which are mostly negative. In this paper, we analyze the public perspective of P2P lending regarding their opinion. We use text classification using Naïve bayes and random forest tree to classify their opinion. The data are collected from Google Playstore application review which are manually labeled as positive or negative. This paper also analyzes the reasoning behind such sentiments and the aspects most important to Indonesian users in P2P lending services. The experiment shows no significant difference in the accuracy using both classifiers. We found keywords that affect the sentiment using InfoGainAttribute in Weka. Based on manual review, the users mainly focus on the speed of loans going through, the ease of use of the application as well as convenience in reviewing the platform.

Keywords: *fintech, P2P lending, sentiment analysis*

INTRODUCTION

Financial technology (fintech) refers to any technological innovations relating to the financial sector such as cryptocurrencies, digital currencies, and investments[1]. Peer-to-peer (P2P) lending is a part of fintech involving the process of giving and receiving finances through the internet from a crowd. P2P lending services are more focused to ease the lending process for low-income citizens and small and medium-sized enterprises (SMEs)[2]. In recent years, many P2P lending platforms have gained popularity. Such services aid people without access to formal banking services to receive loans[3]. P2P lending may ease the public in accessing small loans with lower rates however various issues and risks have emerged from the disruptive nature of P2P lending. Issues regarding the payment collection method and the safety of users involved. These issues led the Otoritas Jasa Keuangan (OJK) 1 to ban platforms from providing P2P lending services for the public as lenders[4]. OJK released a list of P2P lending platforms that has been approved or registered in their database to improve customer protection and lower risks[5]. Currently only one platform, Danamas, has been approved by OJK.

Currently, the review on Google Playstore in regards to P2P lending has been mixed. Many users leave reviews in hopes to get their request processed quicker instead of their experience with the platform. Users with bad experiences also commonly bad mouth the application without giving a reason as to why they feel negative. Users with good experience also commonly leave one-word replies without any further explanation. P2P lending is needed by low-

income Indonesians as an easy way to get a loan. Unfortunately, P2P lending has been getting a wave of negativity due to lack of regulations.

This paper aims to observe the public sentiment of five different P2P lending platforms and uncover the factors deemed valuable and issues faced by users and whether there is a difference in sentiment in concerned the approved or registered applications. The platforms are chosen consists of one approved and four registered applications by OJK. This paper uses sentiment analysis to produce a comprehensive understanding of the factors that affect positively on negative reactions from the public towards P2P lending.

This paper is divided into six sections; introduction, literature review, methodology, results, discussion, and conclusion. The next section describes related works that clarifies the definition of P2P lending and sentiment analysis as it corresponds to the purpose of the paper. Section 3 entails the methodology and section 4 explains the results of the experiments and elaborate on the analysis of the sentiments in section 5. The last section summarizes the conclusion about the public sentiments of P2P lending in Indonesia.

RELATED WORK

P2P lending is the act of giving or receiving small/microloans through the internet without a traditional financial institution[6]. P2P lending has two participants, lenders, and borrowers[7]. Lenders are the people who lend their money in return for interest. Borrowers refer to the people who seek loans. However, in some cases, the platform is also considered a participant[8]. In Indonesia,

the platforms are commonly considered as a participant because they act as a medium between the lenders and borrowers.

Lenders and borrowers have certain risks in P2P lending. Both participants have information asymmetry as they do not have any interaction and they have the risk of private information getting stolen or leaked[9]. In Indonesia, there have been multiple cases where customers' private contacts have been taken and used to promote the platforms. Lenders have no information on the borrowers' credit history, their loan to income ratio, and delinquencies[10]. Borrowers risk getting terrorized by debt collectors the platform uses and their relatives or acquaintances getting harassed by the platform[9]. Users are rarely lenders in Indonesia[4]. This paper will focus mainly on the platform and borrowers.

Klaftt, Chen, and Yum has conducted for P2P lending focuses on the risks of being an investor/lender. Lenders' trust in the intermediary and the borrowers has been studied to prove the effect of trust in P2P lending[11]. Experience and wisdom of the crowd affect the lenders' intention to invest in P2P lending[12]. The importance of lender awareness on borrowers to fund is vital for the lenders[10]. Platforms should provide a way for lenders to educate and raise awareness of the dangers of P2P lending. Analysis of the features that play a role in microlending environments for a lender has been studied[3]. The paper shows ratings affect the lenders' likelihood to lend funds. Many studies focus on lenders as the risk for loss is greater than borrowers. However, it is important for borrowers to have the awareness and knowledge of proper P2P lending conducts.

Overseas P2P lending has a different business process than in Indonesia. P2P lending overseas focuses on the crowdfunding aspect. The borrowers provide private information and details on how the funds are to be used. The lenders can select which borrowers they decide should get funding. In Indonesia, most platforms acts as lenders. The platform decides whether they can or cannot fund them. Studies on whether the borrowers' persuasiveness effect lenders have been conducted. The borrowers' sentiment in their loan request description affects lenders' willingness to fund the request[13]. The effect of soft information such as typing errors, text length, and keywords are studied. The paper shows that soft information has some effect on funding success but hard information such as credit scores have a more substantial effect[14]. Multiple studies focused on the overseas P2P business process has been conducted. Studies, where the platform acts as lenders as well as the intermediary, needs

more research. Therefore, this paper aims to observe the aspects that a borrower values in a platform.

Sentiment analysis is the study that classifies an opinion, attitude, and emotion towards a subject/entity[15]. There are three classification levels for sentiment analysis; document level, sentence level, and aspect level. Document-level classifies whether the opinion of an opinionated document is positive or negative. The sentence-level classifies the positive or negative opinion of a sentence. Aspect level classifies a sentiment for a specific object/entity. Sentiment analysis can be used to discover the correlation between two or more things, for example, the movie reviews in correlation to box-office revenue[16].

METHODOLOGY

This section explains the steps taken in this paper. The stages of this paper can be seen in figure 1. This section is divided into data collection, text preprocessing, and sentiment classification. There are two experiments conducted in this research. One where the data is preprocessed and one with unprocessed data. This distinction is made to observe whether preprocessing affects the accuracy in identifying the sentiment.

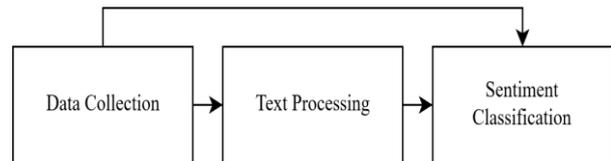


Figure 1. Stages of the research

Data collection. The data collected is taken from the reviews of five applications through Google Playstore reviews. The application was the four most popular applications in the search results for "pinjaman online", which translates to online loans, during data collection. Danamas was also taken in for analysis as it is the only approved application by OJK. Each application has a minimum of 500 reviews with varying amounts of positive and negative ratings before duplicate removal and content review. The reviews which included in the data are the most recently written reviews during data collection. The total number of reviews used is 1,632. The ratings of each application can be seen in Table 1.

Table 1. Application ratings^a

Application	Rating
Adakami	3.6
Easycash	4.1
Danamas	3.7
Dometkilat	3.4
Indodana	4.2

^aThe ratings shown are on the range of 1 to 5 stars

TEXT PREPROCESSING

Text preprocessing entails the removal of punctuation and symbols, the removal of stop words and slang, and stemming. The slang dictionary used is a public dataset to convert Indonesian slang to formal form[17]. The symbols removed consists of full stops, commas, and other common reading symbols however symbols that represent emoticons/emojis are not deleted. The process can be seen in figure 2. The preprocessing is executed using R version 3.6. There are two experiments conducted; one with preprocessed data and one with unprocessed data. This is done to compare whether preprocessing has a significant impact on the results.

The experiment is conducted in two conditions to see if the removal of slang language, stemming, and stopwords affect the accuracy. The purpose of preprocessing is to remove any irrelevant information that might skew the results.

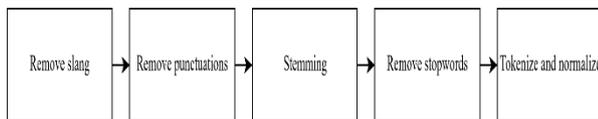


Figure 2. Text processing scheme.

SENTIMENT CLASSIFICATION

Annotators classified the sentiment of each review manually. The third party is instructed to classify the reviews based on the following guidelines:

The review must contain a clear positive or negative opinion.

The review can be used as long as it reflects a positive or negative opinion on the application itself or its service quality.

If the review consists of opinions on the application itself and its service quality, the sentiment reflected must represent the service quality.

If the review contains a positive review with criticism/complaint, the star rating will identify whether it is positive or negative. Ratings with 3 stars and above will be considered positive while below 3 stars will be considered negative.

If there are positive or negative reviews with contradicting star rating, the reviews will determine the positive or negative sentiment of the review.

The analysis is conducted using Weka 3.6. The filter stringvector is used to map the words in the reviews to a set of numerical attributes based on its occurrence. This filter is used to translate the value of the words into numbers for the computer to analyze. The prune rate for the dictionary is set to 2%. This is done to minimize the effect of outlier data that might interfere with the classification of the data. The data is then tested using Naïve Bayes and Random Forest Tree. This is done to prove there is a correlation between the reviews and ratings and its sentiment. This also proves that the data collected can definitively differentiate the positive and negative sentiments in the reviews.

Aside from observing the public sentiment, this paper also aims to identify the factors that affect sentiment. To determine the aspects users' value most, an attribute evaluator is used to extract the important keywords from the reviews. In this paper, weka.attributeSelection.InfoGainAttributeEval is used to identify the keywords that affect the sentiment by calculating the information gain concerning the class. Information gain is the correlation between two variables.

Results

This section discusses the results achieved from the experiments conducted. The percentage of positive to the negative ratio for all data used is 36% positive to 64% negative. The positive percentage for Adakami, Easycash, Danamas, Dompetikilat, and Indodana consecutively is 47%, 59%, 28%, 24%, and 29 %. The complete percentages can be seen in Table 2.

Table 2. Positive-negative percentage for applications

Application	Positive (%)	Negative (%)
Adakami	47	53
Easycash	59	41
Danamas	28	72
Dompetikilat	24	76
Indodana	29	71
Combined	36	64

This experiment used two variants of the data, an unprocessed version and a version that went through preprocessing. The results achieved shows little to no

significant difference when using either data variants. Based on the results, the data can be considered cohesive and can be used to analyze the current sentiment of the

public towards the P2P lending applications. Table 3 shows the accuracy of the data classification with and without preprocessing using naïve Bayes and random forest tree.

Table 3. Accuracy of data classification with and without preprocessing

Applications	Data without preprocessing		Data with preprocessing	
	Naïve Bayes [%]	Random Forest Tree [%]	Naïve Bayes [%]	Random Forest Tree [%]
Adakami	97.83	97.83	97.53	98.14
Easycash	95.06	96.60	95.67	95.67
Danamas	98.52	98.52	98.52	98.15
Dompеткиlat	94.44	93.82	91.04	92.28
Indodana	91.97	91.66	92.90	91.97

The difference between the preprocessed and unprocessed data is negligible. The result further emphasizes the insignificant effect of preprocessing in the data used in relation to the classification of this data. Therefore, the data collected can be used to form the prevailing and general consensus of the public on P2P lending. This is further

discussed in section 5. The data shows several factors that affect the public sentiment on P2P lending.

The data that went through preprocessing is used to identify the keywords that affect the sentiment most based on information gain. Based on the results, rating has the highest effect on the sentiment of the reviews. The list of keywords that affect the sentiment most can be seen in Table 4.

Table 4. Keywords with most information gain

Bantu (Help)	Limit (Limit)	Cepat (Quick)	Tanggal (Date)	Langsung (Instantly)
Data (Data)	Mudah (Easy)	Terima (Accept)	Tagih (Collection)	Telat (Late)
Isi (Fill)	Cair (Liquidate)	Daftar (Register)	Sopan (Polite)	Butuh (Need)
Tolak (Reject)	Masuk (Get in)	Proses (Process)	Ribet (Complicated)	Aneh (Weird)

The data is manually reviewed to identify the factors/aspects that would affect the users' sentiment based on the keywords. Based on the results, the factors/aspects that affect reviews' sentiment correlate to difficulty in registering or approval of requests, the amount of time it takes the platform to send funds, application ease of use, the received funds not matching with their requests, and the harsh nature of debt collection . These factors will be further discussed in the following section.

DISCUSSION

This section elaborated on the positive and negative factors that was obtained from the experiments. The first part of the discussion will focus on the positive reviews and their factors while the second part will focus on the negative side.

P2P lending in Indonesia is unique because most platforms do not provide services for users to be lenders. This might be done to protect the customers as many users do not know the dangers of P2P lending. Henceforth, the platforms will also be considered as lenders. Investing in P2P lending is risky, and investors need to be educated and experienced to lower risks. Platforms acting as lenders as well reduces the information asymmetry.

However, Danamas is an exception as it is a platform specifically for lenders and has been approved by OJK. This causes confusion as P2P lending is synonymous with the term online loans (pinjaman online). This issue will be further discussed in the second part of the discussion.

Danamas is the only platform that has been approved by OJK while the other are only registered. As Danamas is the only platform approved to provide lenders services, this shows that approved applications have the liberty to provide lender and borrower services. Registered

applications, however, are restricted to only borrower services while the platform itself acts as the lender.

Each application varies in the information needed to register. All applications used needs an active phone number and user's identification card. Some requires NPWP (identification number for tax) and pay slip information[18]. None of the applications used in this paper requires collateral for borrowing funds although some charges a fee for credit checks. The interest varies from 0.1% to 7%. The minimum age for each application also varies from 18-21.

This slight difference in the accuracy of processed and unprocessed data could be due to the lack of irrelevant data in the reviews. Most reviews are straightforward in discussing their complaints or praises. There are little irrelevant words in the reviews resulting in the closeness of the accuracy.

Based on Table 4, certain keywords have more weight in effecting the overall sentiment of the review. Keywords such as "daftar", "butuh", and "bantu", which translates to "register", "need", and "help", are used in both positive and negative reviews. Keywords such as "data", "ribet", and "aneh" has a negative connotation. These words mean "data", "complicated", and "weird". Reviews with these keywords are usually referring to the application interface being confusing or hard to navigate.

Positive reviews. The number of positive reviews was 36% for all the applications combined. This shows the public has a fairly negative view of P2P lending. Only one of the applications, Easycash, has more positive reviews than negative with 59% positive reviews. Easycash also has a high rating during data collection at 4.1 stars.

Many positive reviews contain factors such as the speed of funds getting transferred and application ease of use. Easycash has the highest rating with the most amount of comments referring to the speed of funds transferred. Application ease of use also affects the rating. Indodana has the highest reviews regarding the ease of use followed by Easycash.

Indonesians value ease of use and speed over anything else when it relates to P2P lending. Banks can provide loans without collateral (KTA/Kredit Tanpa Agunan) however the process takes up a lot of time[19]. In comparison, P2P lending is more convenient as it can be done from the comfort of their own home and the transaction is completed within a few days[20].

Some positive reviews state the platform was quick to transfer the funds but reports receiving less funding than they requested. This can be a result of the platforms' risk assessment program. In these cases, the users commonly rate the platform positively as they are grateful for the funds going through and emphasizing the importance of speed for the users.

NEGATIVE REVIEWS

The data used shows 64% of the reviews are negative. Dompotkilat is the most negatively reviewed application within the data at 76%. This corresponds to the rating where Dompotkilat sits at the lower end of the ratings with 3.4 stars.

The negative reviews mostly comment on the slow fund transfer or approval, debt collection method and the difficulty in registering. Location availability and bank

variants the application agrees to use is a common but small portion of the negative reviews.

Negative comments regarding the speed of the transfers or approval of loans are the most common complaint in all applications. Many users from Indodana, Easycash, and Dompotkilat claim their requests are rejected within a few minutes of applying. Others complain after a long wait their requests are rejected. The negative reviews are given due to the lack of transparency on why their requests were rejected. Trust is a factor that causes the platform to reject some requests however the borrowers are not informed as to the reasoning leading to the backlash[11].

The debt collection method is high on the list of risks in using P2P lending. In Indonesia, there have been countless issues rising due to debt collection starting from verbal threats, contacting people concerning the users, threaten with violence, and terrorizing the users on social media[21]. This issue arises when the platforms use a third-party debt collector. Based on the reviews, Easycash was the only platform with multiple claims where the debt collector was rude, used verbal threats, and contacted people in the users' life.

Location availability for some applications is limited leading to users in rural areas to complain and leave negative reviews. This complaint appears mostly on Indodana's review data. The users claim areas around Sulawesi, Sumatera and Jawa Timur is not yet covered. This causes users to negatively rate the application. Indodana also has negative reviews due to users failing to register. Users are unable to upload their identification card (KTP) failing to register. These bugs in the application caused many of the 71% negative reviews which resulted in low ratings. This can be concluded as Indodana has a high star rating at 4.2.

For Danamas in particular, many negative reviews are due to the misunderstanding of the users in regard to the function of Danamas. Indonesian users identify P2P lending or fintech as online loans. Online loans are services that allow users to borrow funds for some time with interest. Most negative reviews complain about the difficulty in registering because the users need to have references from existing users and a Sinarmas bank account. Danamas has a star rating of 3.7 due to this misunderstanding.

Based on the experiments and analysis, it can be concluded that Indonesian P2P lending users value the quick approval and the amount of time it takes for the platform to send the loans. Many reviews are positive in hopes to get the platform to approve their loans and consequently negative if their loan request is rejected. This is caused by the lack of knowledge on how the P2P lending process works, hence the users assume leaving a positive review will improve their chances of getting approval. Positive reviews are given even though the amount the fund the users receive were not accurate to the request in gratitude as the users realize formal banks might not have rejected their request outright. Debt collection affects the reviews however, reviews left regarding the harsh debt collection method does not seem to deter new users from joining. This can be seen in some reviews where the users state that the borrowers experiencing the harsh collection method is in fault as they did not pay back their loans in time.

The misunderstanding of Danamas' business process shows the lack of public education regarding P2P lending. The public should be educated regarding the types of P2P lending and how the system works to avoid similar issues

to Danamas. The dangers of P2P lending should be discussed more in public to raise awareness on the proper lending approach. Transparency from the platforms are also important as it can help the users understand as to why their request was rejected.

Based on this discussion, the public knowledge on how the P2P lending business process is lacking hence resulting in majorly negative reviews on the platform. The factors that affect the sentiment are speed, ease of use, availability, transparency, and the debt collection process. In order to educate the public, workshops on the business of P2P lending should be shared and broadcasted. Regulations on the debt collection is needed and should be considered by the government to protect the customers.

CONCLUSIONS

Based on the discussion, it can be concluded that Indonesian P2P lending application users value the speed of the requests being approved and loans going through rather than the safety of using such services. This can be seen as the majority of positive or negative reviews, and low ratings are based on the speed of loan transfer and approval. The second concern that seems prevalent to most users is the method of debt collection. The misconception of fintech and P2P lending also affects the users' perception of the platform. This can be seen from the ratio of positive to negative reviews received by the applications.

This research is limited to the five applications used and the sentiment of Indonesian users. The results of this paper can be used to improve regulations with the public's need in mind. Knowing the factors that affect the public to leave negative reviews could be used by platforms to improve their business process. Future research is needed to find conclusive general factors that affect user sentiment. Future research can be conducted on different cultural backgrounds to find a common ground on the factors that affect user sentiment.

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