

# Measurement by applying internet financial reporting on the level of information presentation in the competitive FinTech peer-to-peer lending industry

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## ABSTRACT

Technological advances in the financial sector can certainly support the business decision-making process. Moreover, digital financial technology such as FinTech is a competitive industry that has both peer-to-peer (P2P) and merchant pillars. The industry must update its business activities through its information media. One of them is internet-based financial reporting or better known as internet financial reporting (IFR). IFR itself is a delivery of financial information that is carried out in real time and can be easily seen by the wider community by using the website as a medium. This study aims to determine whether the application of IFR to FinTech P2P Lending companies in Indonesia has been widely implemented or not. Later the variables used in this study are content, appearance, and timing with a total of 20 indicator variable items to be tested. The results of this paper show that 30 P2P lending FinTech Industries in Indonesia have been able to implement IFR with an average score of 80%. IFR scores obtained by each industry have almost the same value ranging from 65% to 95% with the highest total score of 95% and the lowest score of 65%.

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## 1. INTRODUCTION

The internet is a necessity for every individual in the modern era as it is today, with the internet every individual can use their daily needs, one of which is used as a means of payment in digital transactions [1]–[3]. With the internet at this time, it has benefits for every community, one of which is the internet can be presented as a medium for delivering information which in the process has advantages such as easy to spread, knows no boundaries, real time, low cost, and has high interaction [4]. For the industry, this can be used as a medium in conveying information to stakeholders regarding the general condition of the industry such as financial information and so on through an industry website [5]. That way, if there are parties who want to see information, they can access it in real time wherever they are without waiting or contacting the industry [6].

Financial technology (FinTech) is a digital-based financial industry whose development has undergone a fairly high transformation in the last 10 years as a result of many banking activities that have shifted from the conventional sector to the digital banking sector [7]–[9]. FinTech has several types of sections, namely crowdfunding, microfinancing, digital payment system, E-aggregator, peer-to-peer (P2P) lending [10], [11]. One part of FinTech, namely P2P lending [12] which is a digital funding and acceptance service in the same industry, it can also be interpreted that P2P Lending is a digital funding service that brings together funding providers and those who need funds on one digital platform [13].

Providing financial information through industry websites can be called internet financial reporting (IFR) [13], [14]. IFR is a voluntary provision of financial information by utilizing the internet as a medium for providing information [15]. Providing financial information through industry websites can reduce the information gap between investors, industry parties and creditors [15], [16]. By measuring IFR, the industry has fulfilled its responsibilities to the general public regarding the industry's financial reporting [7]. IFR has been widely used in research in order to improve management as has been done by reference [17] the influence of IFR is able to improve the image of the industry with competitors and able to improve front office performance in technological developments. Besides reference [18] also conducts research with IFR measurements in an information system to support investors in making decisions on one pillar of business that moves on the internet.

Along with the development of technological developments towards the financial industry, the industry, in this case the FinTech industry, should make IFR on each of the industry's websites [1], [19], [20]. This is in line with what has been instructed by the *Otoritas Jasa Keuangan (OJK)* as an institution with an interest in the financial services sector in Indonesia [21]. OJK in its roadmap for Industrial Governance in Indonesia which was designed in 2014 requires the financial services industry to disclose certain material information such as financial reporting through industry websites [22], [23].

And there are still many FinTech industries that have not implemented IFR on their industrial sites and there are also many FinTech industries that have implemented IFR but in practice it is not yet optimal as most of the information presented on industry websites is only about the products or services offered and there are several industries that have not updated information that has been presented [24]. From the problems that have been explained, the author tries to apply IFR to the FinTech Industry in Indonesia which consists of content, presentation, and timing variables with indicator items to be tested [25]. FinTech is starting to develop rapidly and research is often needed since international outbreaks such as Covid 19 where financial movements can be carried out with FinTech [10].

## 2. MATERIAL AND METHOD

### 2.1. Variable and dataset

In this paper, of course, measuring accuracy with IFR to get an optimal industry in service. So, we need a variable in getting the IFR size value. Variables and datasets are the basis for conducting research in this paper. With optimal accuracy in IFR, it can become a behavior in the FinTech industry. This variable is the result of a combination of several variables that are often used in conducting IFR research. The variables are Table 1.

Table 1. Variable used

Variable	Items
Content	Statement of Financial Position
	Profit and Loss Statement for the Year
	Statement of Changes in Current Year's Equity
	Current Year Cash Flow Statement
	Current Year's Financial Records
	Number and Quality of Earning Assets
	Current Year Quarterly Report
	Current Annual Report
	Last Year's Financial Report
	Dividend Information
	Company Information
	Highest Shareholder
	Layout
Annual Report PDF Format	
Link to Homepage	
Report Downloading Ability	
Direct Email Contact	
Response	Website Update Last Date
	Latest News Information
	Information on when to get response to inquiries via email and online inquiries

In Table 1 is the formation of variables based on regulations issued by OJK. The alternatives in this study are 30 FinTech industries that have been officially licensed at the OJK as of January 2022 which have been consistently registered for 2 years and have ISO 270,001 permits. This paper uses purposive sampling with the author providing criteria in determining which to use, namely,

- FinTech P2P lending has an official website that is active and not in maintenance

- The P2P lending FinTech industry that is considered to have carried out IFR is an industry that has reported financial information on its official website.
- The FinTech industry has been established for 2 years and has been registered with OJK.

In FinTech problems that often occur when there is maintenance. A good FinTech is a FinTech that reports all of its activities and can be published in the public [26]. So based on observations of the FinTech industry data which will be scrutinized and have implemented IFR and have been officially licensed by the OJK as of January 2021-2022, it can be seen in Table 2.

Table 2. P2P lending FinTech industry data

No	Industry	Links
1.	Danamas	<a href="https://p2p.danamas.co.id">https://p2p.danamas.co.id</a>
2.	Investree	<a href="https://www.investree.id">https://www.investree.id</a>
3.	Amartha	<a href="https://amartha.com">https://amartha.com</a>
4.	Dompet Kilat	<a href="https://www.5dompetkilat.co.id">https://www.5dompetkilat.co.id</a>
5.	Kimo	<a href="http://kimo.co.id">http://kimo.co.id</a>
6.	Toko Modal	<a href="https://www.tokomodal.co.id">https://www.tokomodal.co.id</a>
7.	Uang Teman	<a href="https://uangteman.com">https://uangteman.com</a>
8.	Modalku	<a href="https://modalku.co.id">https://modalku.co.id</a>
9.	KTA Kilat	<a href="http://www.pendanaan.com">http://www.pendanaan.com</a>
10.	Kredit Pintar	<a href="http://kreditpintar.com">http://kreditpintar.com</a>
11.	Finmas	<a href="https://www.finmas.co.id">https://www.finmas.co.id</a>
12.	AdaKami	<a href="http://www.adakami.id">www.adakami.id</a>
13.	IndoDana	<a href="https://www.indodana.id">https://www.indodana.id</a>
14.	Cicil	<a href="https://www.cicil.co.id">https://www.cicil.co.id</a>
15.	Julo	<a href="http://www.julo.co.id">www.julo.co.id</a>
16.	EasyCash	<a href="http://indo.geteasycash.asia">http://indo.geteasycash.asia</a>
17.	KlikA2C	<a href="https://www.klika2c.co.id">https://www.klika2c.co.id</a>
18.	Ammama.id	<a href="https://ammaa.id">https://ammaa.id</a>
19.	PinjamanGo	<a href="https://www.pinjamango.co.id">https://www.pinjamango.co.id</a>
20.	KoinP2P	<a href="https://koinp2p.com">https://koinp2p.com</a>
21.	PohonDana	<a href="http://pohondana.id">http://pohondana.id</a>
22.	Mekar	<a href="https://mekar.id">https://mekar.id</a>
23.	Awan Tunai	<a href="http://www.adakami.id">www.adakami.id</a>
24.	Esta Kapital Fintek	<a href="https://www.estakapital.co.id">https://www.estakapital.co.id</a>
25.	Kreditpro	<a href="http://kreditpro.id">http://kreditpro.id</a>
26.	Rupiah Cepat	<a href="http://www.rupiahcepat.co.id">www.rupiahcepat.co.id</a>
27.	Dana Merdeka	<a href="http://danamerdeka.co.id">http://danamerdeka.co.id</a>
28.	Dana Rupiah	<a href="https://www.danarupiah.id">https://www.danarupiah.id</a>
29.	Uangme	<a href="http://uangme.id">http://uangme.id</a>
30.	CashCepat	<a href="http://cashcepat.id">http://cashcepat.id</a>

## 2.2. General architecture

In this paper can not be separated from the general architecture. In order not to run from unwanted paths for success in this research. Research is a measure of IFR accuracy in the FinTech industry. The general architecture can be seen in Figure 1.



Figure 1. General architecture

Figure 1 which is the general architecture in this study. The general architecture has 4 stages which are packaged neatly and concisely. The stages in analyzing research data in this study are,

- Crawling data from [www.ojk.go.id](http://www.ojk.go.id)
- Giving a scores for each variable that has been provided through the FinTech industry website, if the item is disclosed it will be worth a score of 1 and if it's not disclosed it will be given a zero score.

- The scores that have been obtained from the FinTech industry later on the three variables provided will be added up to obtain a total score of information from each industry.
- Calculating the IFR completeness score according to [27], [28] by using (1),

$$IFR\ Index = \frac{\sum\ the\ score\ that\ has\ been\ obtained\ by\ the\ Fintech\ industry}{\sum\ Item\ Maximum\ Score} \quad (1)$$

Where:

The variable maximum score is obtained from the total variable assessment item indicators totaling 20 variables. where is the formula for this calculation, the more item information is presented, the higher the IFR score obtained. However, IFR is generally represented by a percentage (%).

- Get the IFR FinTech algorithm model.

### 3. RESULTS AND DISCUSSION

The P2P lending FinTech industry is a digital industry that accepts and provides credit to the public, where the industries that are members of the P2P lending FinTech should have information transparency on the activities that have been carried out to the general public. In order to transfer the information previously explained, the industry can provide information through the industry website by disclosing financial and non-financial information on their website. The calculation of IFR scores for all variables from 30 FinTech P2P lending industries based on observations made during April 2022 is shown in Table 3.

Table 3. IFR results in industry

No	Industry	Content		Layout		Response		IFR Value	
		Item	%	Item	%	Item	%	Item	%
1.	Danamas	12	100%	4	57%	3	100%	19	95%
2.	Investree	12	100%	3	43%	3	100%	18	90%
3.	Amartha	12	100%	4	57%	3	100%	19	95%
4.	Dompet Kilat	9	75%	4	57%	2	67%	15	75%
5.	Kimo	8	67%	4	57%	2	67%	14	70%
6.	Toko Modal	10	83%	4	57%	3	100%	17	85%
7.	Uang Teman	11	92%	4	57%	3	100%	18	90%
8.	Modalku	9	75%	4	57%	3	100%	16	80%
9.	KTA Kilat	12	100%	3	43%	3	100%	18	90%
10.	Kredit Pintar	10	83%	3	43%	3	100%	16	80%
11.	Finmas	11	92%	2	29%	3	100%	16	80%
12.	AdaKami	12	100%	4	57%	3	100%	19	95%
13.	IndoDana	12	100%	4	57%	3	100%	19	95%
14.	Cicil	10	83%	4	57%	3	100%	17	85%
15.	Julo	11	92%	4	57%	2	67%	17	85%
16.	EasyCash	11	92%	4	57%	2	67%	17	85%
17.	KlikA2C	9	75%	4	57%	2	67%	15	75%
18.	Ammana.id	9	75%	4	57%	2	67%	15	75%
19.	PinjamanGo	7	58%	4	57%	2	67%	13	65%
20.	KoinP2P	10	83%	4	57%	2	67%	16	80%
21.	PohonDana	10	83%	4	57%	2	67%	16	80%
22.	Mekar	10	83%	4	57%	2	67%	16	80%
23.	Awan Tunai	11	92%	4	57%	2	67%	17	85%
24.	Esta Kapital Fintek	12	100%	4	57%	2	67%	18	90%
25.	Kreditpro	11	92%	2	29%	2	67%	15	75%
26.	Rupiah Cepat	12	100%	3	43%	3	100%	18	90%
27.	Dana Merdeka	12	100%	3	43%	3	100%	18	90%
28.	Dana Rupiah	12	100%	2	29%	2	67%	16	80%
29.	Uangme	10	83%	4	57%	3	100%	17	85%
30.	CashCepat	11	92%	1	14%	3	100%	15	75%

From the calculation results, it can be seen that the highest value from the calculation of the IFR score is obtained by the Danamas FinTech industry with a score of 95% with a total of 19 items of information disclosure on their website. While the lowest IFR score obtained in this calculation is Go Loans with a percentage of 65% with a total of 13 items of information disclosure. Based on the results of this calculation, it is also known that the results obtained are in the range between 65% to 95%. These results have not been categorized as good results because there is no provision regarding this. However, judging by the amount of information provided by P2P lending FinTech companies, it can be said that the industry has mostly presented

several items that have been tested and the information provided is sufficient. In Figure 2, the data visualization is designed as shown in Figure 2.

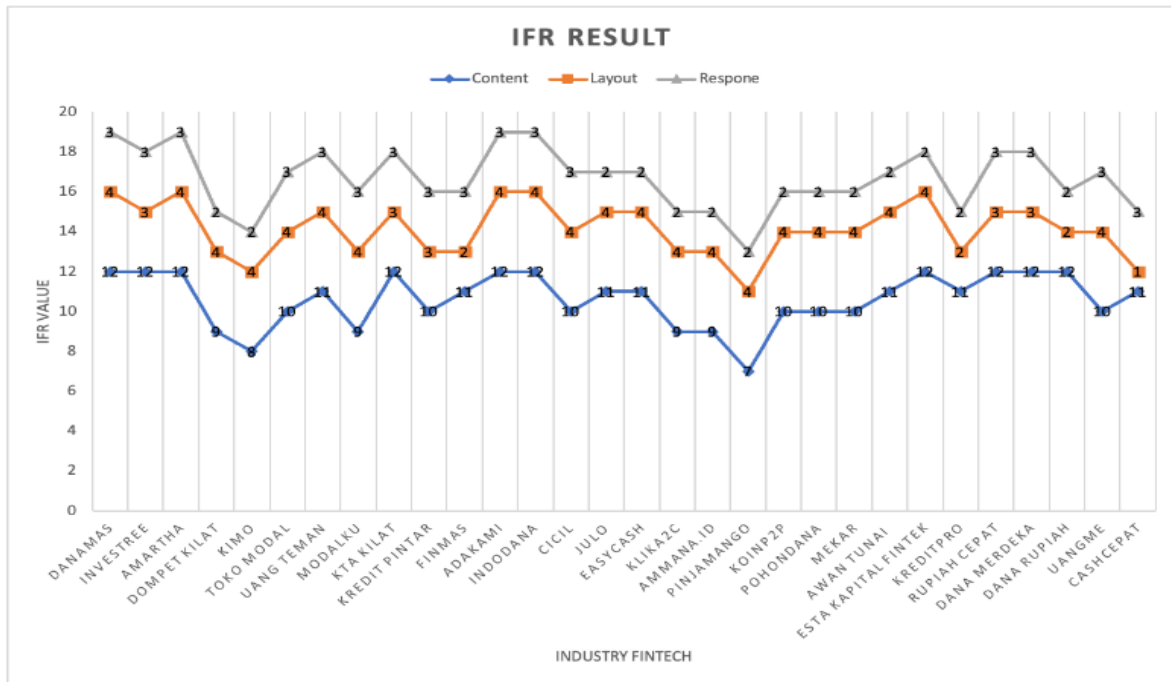


Figure 2. IFR result

And from the calculation of Table 3, the average IFR score achieved by the FinTech industry is also 80% (16 items). This result is a positive response, especially for the digital financial industry because they've managed to achieve an IFR score of more than 80% and have followed the rules from the OJK. After knowing the results of the IFR score calculation, the researcher can then rank from the highest to the lowest score based on Table 4.

Table 4. IFR FinTech score ranking

Rangking	Industry	IFR Items	IFR Value	Rangking	Industry	IFR Items	IFR Value
1.	Danamas	19	95%	16.	UangMe	17	85%
2.	Amartha	19	95%	17.	Modalku	16	80%
3.	AdaKami	19	95%	18.	Kredit Pintar	16	80%
4.	IndoDana	19	95%	19.	Finmas	16	80%
5.	Investree	18	90%	20.	Mekar	16	80%
6.	KTA Kilat	18	90%	21.	KoinP2P	16	80%
7.	Esta Kapital Fintek	18	90%	22.	PohonDana	16	80%
8.	Rupiah Cepat	18	90%	23.	DanaRupiah	16	80%
9.	Uang Teman	18	90%	24.	Dompet Kilat	15	75%
10.	Dana Merdeka	18	90%	25.	KlikA2C	15	75%
11.	Cicil	17	85%	26.	Ammana.id	15	75%
12.	Julo	17	85%	27.	Kreditpro	15	75%
13.	EasyCash	17	85%	28.	CashCepat	15	75%
14.	Awan Tunai	17	85%	29.	Kimo	14	70%
15.	TokoModal	17	85%	30.	Pinjaman Go	13	65%

Based on Table 4, it is known that there are 4 FinTech industries with the highest scores in delivering IFR information through a website. With this IFR score, the industry can find out how the quality and quantity of what they present, both financial and non-financial, is on the industry's official website. And also with this research, it is hoped that the industry can improve or maintain the quality that has been achieved. So that the IFR measurement in the FinTech Industry can be utilized by the data mining field to predict FinTech behavior.

However, its application to the field of computer science lies not only in the accuracy of IFR measurements. There are things considered in the computational model that can be solved by computational models and computational constraints [29] because FinTech is part of computer science in knowing trends [30]. So, to get the best results based on the regulations that have been formed, a mathematical model based on (2) is derived.

$$IFR(\text{FinTech}) = \left(\frac{\text{Score}}{\text{max}} \% \text{content}\right) + \left(\frac{\text{Score}}{\text{max}} \% \text{time}\right) + \left(\frac{\text{Score}}{\text{max}} \% \text{response}\right) \quad (2)$$

Where,  $IFR(\text{FinTech})$  is the accuracy value of FinTech based on government regulations.  $\left(\frac{\text{Score}}{\text{max}} \% \text{content}\right)$  is the value of each content component,  $\left(\frac{\text{Score}}{\text{max}} \% \text{time}\right)$  is the value of each time component. And  $\left(\frac{\text{Score}}{\text{max}} \% \text{response}\right)$  is the value of each response component. So, an algorithm for measuring IFR FinTech is formed in Figure 3.

```

input:
financial_report_amount : integer
report_creation_time : integer
number of questions : integer
number of response true : integer
output: IFR(FinTech)
process:
content ← financial_report_amount
time ← report_creation_time
response ← number of response true / number of questions
IFR (FinTech) ← (score/max * content %) + (score/max * time %) + (score/max * response %)
if IFR(FinTech ≥ 65%)
    Good FinTech
else
    There are Constraints
end if
end algorithm

```

Figure 3. FinTech IFR algorithm

In Figure 3 is an algorithm in IFR FinTech, the inputs are total financial reports, report creation time, number questions, and total response true. The process is then carried out by calculating the content, time, and response values. After these values are obtained, the IFR value can be calculated using the (2). The output of the pseudocode is an IFR value that can be used to evaluate FinTech IFR performance. In this algorithm, there are conditions based on the lowest FinTech IFR value of 30 FinTechs that have consistently been registered and licensed by the OJK for 2 years. Where the permit is a FinTech that does not consistently have an ISO 270,001 security system so it can be concluded that if the IFR is below 65% then there are computational constraints such as a security system, the offer given from this paper is for FinTechs whose IFR value is below 65% to take advantage of data security models such as open systems interconnection (OSI) security model, Bell-LaPadula security model, Biba security model, Harrison-Ruzzi-Ilman security model, and take-grant security model. With the existence of a security model available in FinTech, of course, it can help in conveying information widely.

#### 4. CONCLUSION

On the 30 FinTech industries that have been researched, they've been implemented IFR and got an average score of 80% or 16 items have been met with each score range not significantly behind, which is between 65% and 90%. And the FinTech companies that have been researched already provided the information they have, the results of observations on the content variable state that the FinTech industry on average has fulfilled item content with 10 items and even 5 industries perfectly provide content with 12 variable items. While the variable content of the FinTech industry is still unsatisfactory with the highest only touching number 4 out of 7 variable items fulfilled with 6 industries occupying the highest, while on the average time display the FinTech industry managed to achieve perfectly with a figure of 100% this is very good considering that the website technology that has been used has received very good attention from the industry. So that the existence of the IFR FinTech algorithm can be a pattern in predicting behavior in the FinTech industry.

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