Fintech Payment Application in Improving Customer Services

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Abstract

A finance company is a form of company that takes advantage of technological developments by creating fintech-applications to improve service quality. In 2019, the customer service queue at XYZ Company (PT XYZ) reached 350 queues per month. Meanwhile, the cashier queues to make payments an average of 3800 per month. The high level of queues, can certainly have an impact on office effectiveness and efficiency. This study aims to analyze what constraints have caused the low number of fintech payment application users, how to map potential and non-potential customers usage of fintech applications. The results showed that the problem with the low use of the fintech payment application was because 60% of customers did not know the application, 40% of customers did not have a bank account so they could not make transactions on the fintech payment application and 67% of customers chose payment media through outlets / minimarkets even though they had to pay a fee. To determine the effectiveness of using the application, a TAM (Technology Acceptance Model) is used which consists of trust, value for profit, convenience, social influence and intention to use.

Keywords:
Fintech Payment Applications, TAM, K-Means Algorithm, C4.5 Algorithm

1. Introduction

The development of technology can be seen from the number of mobile phone and internet users. As a result of this development of information technology, technology has emerged that leads to financial innovation with a touch of modern technology in the service sector called financial technology (fintech). Fintech is a new innovation in the field of financial services that adapts technological developments to simplify financial services and the financial system to make it more efficient and effective (Prastika, 2018). Fintech technology provides potential that can benefit various parties in the financial industry (Rahmatillah, 2018, Andria et al., 2020; Muharam, et, al., 2020).

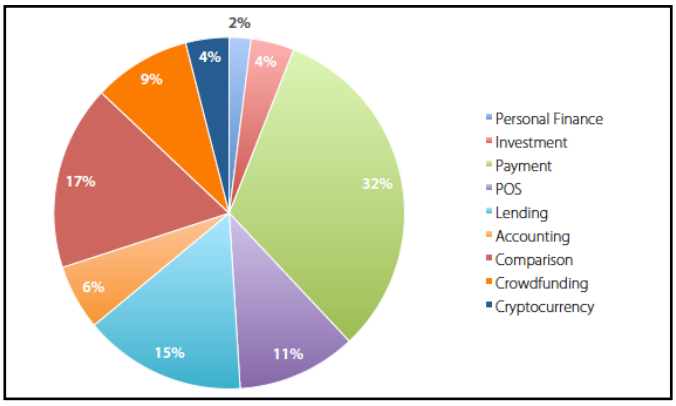

Figure 1. Percentage of Indonesian Fintech Ecosystem Distribution
Source: Secondary Data, fintechnews.sg, (2016)

Figure 1. shows that fintech payment is a type of fintech that is widely used (32%) by the public compared to other types of fintech. One of the benefits that can be felt by the community for the presence of fintech payments is the ease of financial services, such as making it easier to transfer payments as well as providing services for depositing various bills such as telephone, electricity, water bills, even motorbike installment bills so there is no need to queue anymore because you can make payments via smartphone. According to Mellon (2015), several companies demand an optimized payment experience in terms of multichannel speed, convenience and accessibility. If the company is willing to anticipate and prepare for further changes to business payments, it will need to implement innovations in its payments. A finance company is one type of company that deals with money, therefore many finance companies take advantage of technological developments by creating fintech-based mobile applications to improve the quality of their services.

Table 1. Shows the 10 list of multi-finance companies that have the best performance in 2019 in Indonesia, 8 of the ten companies already have a fintech mobile application to facilitate customer access in making installment payment transactions. Mobile applications are software that run on cellular devices such as smartphones, tablets, or PCs. Mobile applications are also known as applications that can be downloaded and have certain functions, thereby adding to the functionality of the mobile device itself. To get the desired mobile application, users can download it through certain sites according to their operating system. Google Playstore and App Store are some examples of sites that provide various applications for Android and iOS users to download the desired application (Mobile Marketing Association, 2015).

Table 1. The Best Performing Multifinance 2019

No.	Multifinance company	*Mobile Application*	Number of Downloaders (*Playstore*)	*Rank* (*Appstore*)
1.	Clipan *Finance* Indonesia	Clipan *Mobile*	1.000 +	163
2.	BFI *Finance* Indonesia	BFI *Finance M Beat*	5.000 +	0
3.	Summit Oto *Finance*	-	-	-
4.	Adira Dinamika *Multi Finance*	Adiraku	100.000 +	40
5.	Astra Sedaya *Finance*	Astra *Credit Company* (acc.one)	50.000 +	136
6.	Bussan *Auto Finance*	BAF *Mobile*	100.000 +	-
7.	*Federal International Finance*	FIF *Group Mobile Customer*	100.000 +	64
8.	Mitra Pinasthika Mustika *Finance*	MPM *Finance*	10.000 +	0
9.	Oto Multiarrha	-	-	-
10.	Mandiri Tunas *Finance*	MTF GO	100.000 +	173

Source: Secondary Data, Infobanknews.com (2019)

The high level of queues, especially in payment transactions, can certainly have an impact on the effectiveness and efficiency of PT XYZ, because it wastes 20-30 minutes of time every time you make a payment transaction. PT XYZ as one of the largest multi-finance companies strives to continue to innovate to improve services to its consumers, especially in the era of increasingly rapid technology.

One of the features that PT XYZ's fintech payment application promotes is direct installment payments from the application. This application provides notification of maturity, customers will get a message reminder to pay installments on the D-7, D-3, and when the day is due, there is even a "payment promise" feature that makes it easier for consumers to schedule payment when on the due date. tempo consumers do not have the funds to make installment payments so they will not be subject to fines. In addition, the advantage of making payments through the fintech payment application is that customers are not charged an administration fee so that it will save costs. The fintech payment application provides added value for fast, safe, and easy transaction services, this is an effort to improve service quality. The increase in Internet users and the presence of this application are expected to reduce queues and activities at each branch office, payments should have started to switch from conventional to digital to provide the best service to the public. The use of the PT XYZ fintech payment application can help the public to find ease in completing administrative matters by using a smartphone connected to the Internet anywhere and anytime, so that activities at branch offices become more effective.

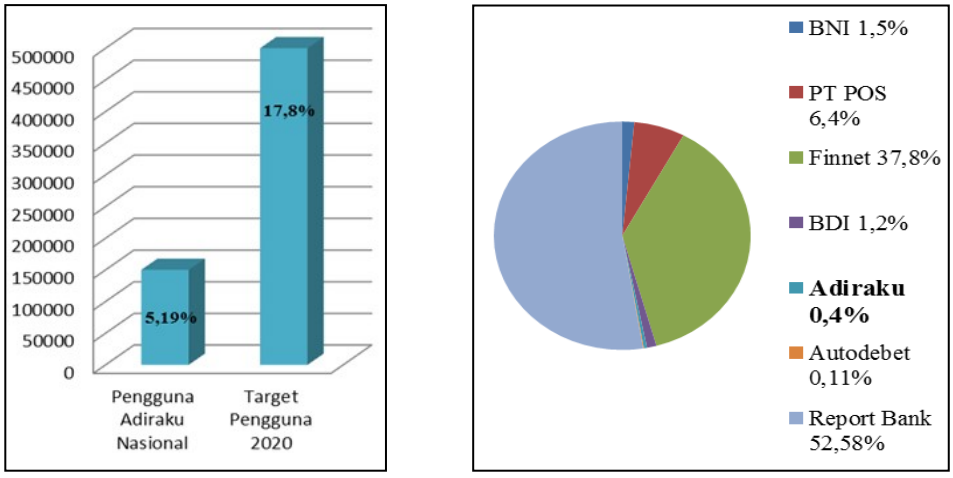

Figure 2. National Fintech Payment Application Users and Payment Media Transactions at PT XYZ
Source: Secondary Data, PT XYZ (2020)

Based on Figure 2. above, it can be seen that PT XYZ customers are still reluctant to use fintech applications. Only 150,000 out of 2,890,000 national population or only 5.19% of customers have used this application in 2020, while the president director of PT XYZ gave a national target of 500,000 users in 2020 or 17.8%. In addition, the payment media through the fintech payment application is only 0.4% of all motorbike installment payment transactions. Abdillah et al., (2016) said data mining can help companies or organizations to get patterns from data stored in the company. The knowledge and information obtained will serve as guidelines in taking business actions as an effort to maintain and increase the competitive level of the company's business. Customers who have the potential to use the PT XYZ fintech payment application need to be known to increase the effectiveness of using the application and to achieve the company's targets, for this reason, the data mining method is used to obtain a pattern.

2. Literature Review

Sari, et. al., (2019) said that a mobile application is a software that runs on a mobile device that allows a person to carry out various activities easily. Mobile applications are also designed to move conventional activities to digital activities. Meanwhile, according to Sumardi (2017) Mobile application is an application that allows you to perform mobility using equipment such as PDAs, cell phones or cell phones. Mobile applications can make it easy to carry out various kinds of activities ranging from entertainment, selling, studying, doing office work, browsing and so on. The use of mobile applications for entertainment is most favored by nearly 70% of cellular phone users, because by

utilizing the features of games, music players, to video players, it becomes easier for us to enjoy entertainment anytime and anywhere.

Furthermore, Rahma (2016) explains that fintech is the latest financial innovation model that is present in the community, so that people can enjoy more modern and easy financial transactions using internet or smartphone technology (Andria et al. 2020). People who are currently starting to depend on the internet or smartphones are becoming market opportunities for fintech companies. The existence of fintech has made it easier for the public to process financial transactions, which has led to the public's attitude to support the existence of fintech and then feel happy using the service. Meanwhile, Lee and Shin (2017) reveal that the growth in the smartphone user base in the mid-2000s facilitated the growth of mobile finance, such as mobile payments and mobile banking, which are extensions of e-finance. Financial institutions have allowed their customers not only to access bank account information, but also to make transactions, such as paying bills and sending money, via their mobile devices. However, according to Rizal et al., (2018), fintech is able to eliminate the role of banks or financial institutions in providing financial services to customers, helping customers make financial decisions, reducing operational costs and risk of loss, for example due to bad credit, and developing markets. However, there are several policies that are still of concern, namely data security, electronic signatures, implementation of digital know your customer, payment electronification, and legal certainty for online-based loans.

Each fintech provider has different types of financial technology services. Digital-based financial services that have developed in Indonesia can be classified into 5 (five) categories, namely payment, lending, aggregator, crowfunding, and personal / financial planning. PT XYZ's fintech payment application is a payment service category (Firdaus, 2018). Lee and Shin (2017) state that payment in financial technology services is relatively easy compared to other financial technology products and services. The two fintech payment markets are: 1) consumer and retail payments, 2) wholesale and corporate payments.

According to Mellon (2015) several companies demand a payment experience that is optimized in terms of speed, convenience and multichannel accessibility. If the company is willing to anticipate and prepare for further changes to business payments, it will need to implement innovations in its payments. These innovations include digital wallets. The massive penetration of the smartphone market is driving innovation in digital wallets, which allow consumers to make payments via mobile. For example, if the digital version of a credit card is stored in a digital wallet and is used to make payments, the bank / financial institution. This service enhances the experience for customers looking for a payment experience that is efficient in terms of speed and convenience. Data mining is not a completely new field. One of the difficulties in defining data mining is the fact that data mining inherits many aspects and techniques from established scientific fields. Starting from several scientific disciplines, data mining aims to improve traditional techniques so that they can handle very large amounts of data with high dimensional data and data that is heterogeneous and of different properties. Data mining is a process or activity to collect large data then extract the data into information that can be used later (Hasibuan, et. al., , 2016).

According to Abdillah et al., (2016) data mining helps companies or organizations to get patterns from data stored in company databases. The knowledge gained will serve as a guide in taking business actions as an effort to maintain and increase the competitive level of the company's business. Andria et al., (2019) said data mining is the process of finding meaningful new correlations, patterns and trends by sorting out large amounts of data stored in repositories, using technological patterns as well as statistical and mathematical techniques . There are many data mining techniques that can be used, including K-Means clustering, Hierarchical clustering, DBS if the main objective is to classify data that is not known to the target class, and if the target data is known, algorithms such as Naïve Bayes, Decision Tree can be used, and Artificial Neural Networks (Tosida et al. 2020). There are several other things related to data mining, including statistics, machine learning, data visualization, and database management.

3. Methodology

The type of research used in this research is descriptive exploratory with a method in the form of a case study which aims to collect data and describe thoroughly the constraints on the effectiveness of using the PT XYZ mobile application. The object of this research is one variable, namely the variable of the effectiveness of the use of PT XYZ's fintech payment application with indicators of Trust (T), Perceived Value (PV), Perceived Ease of Use (PEOU), Social Influence (SI), Intention to Use (IU) (Adzima and Ariyanti, 2018).

The sampling technique used non-probability sampling with the method of accidential convenience sampling and quota sampling (Nazir, 2014). The total population of 4,118 came from the number of PT XYZ customers in 2019, namely 49,420 which were divided into 12 months, and researchers used an error of 10%. The calculation of the number of samples using the Slovin formula is 97.63 which will be rounded up to 100 people. The fintech payment application has been running for 2 years, but PT XYZ customers are still reluctant to use the application (only 5% of users). This study wants to know what are the constraints that make the use of these applications low. Furthermore, descriptive analysis and data mining analysis are carried out using the Clustering method with the K-Means algorithm to categorize customers who have the opportunity to use payment via fintech payment and customers who have no opportunity. Furthermore, using the classification method with the C4.5 algorithm to produce a decision tree using the TAM indicator. The complete flow of this research is shown in Figure 3 below.

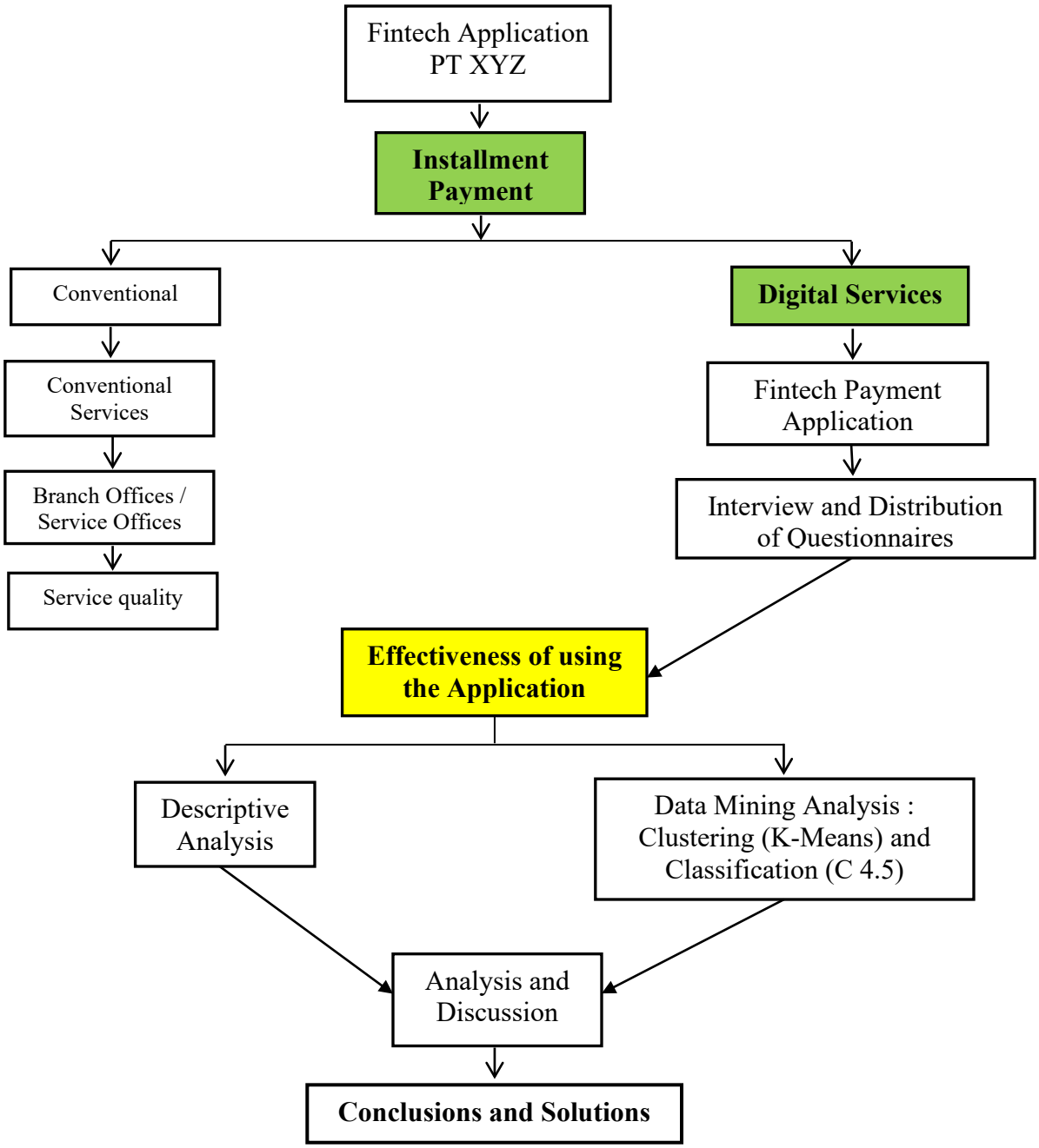

Figure 3. Framework

The TAM method is a method that has a high contribution in monitoring the implementation of Information Technology (IT). This method is widely used by researchers to measure the level of acceptance of a new technology. (Gunawan and lynawati, 2018). Likewise, Nurfiyah et al., (2019) said to find out the factors that can affect user acceptance in online transactions using TAM. This model states that users are more likely to use the system if the system is easy to use and useful for its users. If all the factors to be assessed are properly aligned, system or application innovation will be more successful in use and users will feel more satisfied.

4. Analysis and Discussion

Based on Table 2. below, it can be seen from 100 customer respondents, 53 of whom already know the fintech payment application, but only 13 people have used it, while 40 others who already know the application but never use it. Meanwhile, there were 43 respondents who did not know the fintech paymen application of PT XYZ, so that 43 respondents did not use the application. Even though the branch offices have installed banners, posters and brochures about the application, there are still many who do not know what the application is for and what are the benefits of using it.

Table 2. Knowing / Not Knowing, Using / Not Using the PT XYZ Fintech Payment Application

		Using Fintech Payment		Total
		Using	Not Using	
Knowing the Fintech Application	Knowing	13	40	53
	Do not know	0	47	47
Total		13	87	100

Source: Primary data processed, 2020

Table 3. Having a Bank Account

	Frequency	Percent
Have	60	60,0
Do not have	40	40,0
Total	100	100,0

Source: Primary data processed, 2020

Based on Table 3. above, it can be seen from 100 customer respondents, 60 of whom already have bank accounts and 40 others do not have bank accounts. So that as many as 60% of customers have the opportunity to make payments via the fintech application. Because to make payment transactions through the fintech payment application, customers need a bank account to fill in the digital money balance, which can later be used for payment transactions.

Table 4. Frequently Used Payment Methods

	Frequency	Percent
Post Office	12	12,0
Minimarket	67	67,0
Bank / ATM / M- banking	13	13,0
Colector	8	8,0
Total	100	100,0

Source: Primary data processed, 2020

In Table 4, it can be seen that of the 100 respondents who were making transactions at branch offices they had made payments through other methods, as many as 67 people said they often made payment transactions through minimarkets because the distance between the minimarket and the house was close and the easy payment method made this media often used by respondents, 13 people often make payment transactions via Bank / ATM / M-Banking because they already have a bank account, as many as 12 people often make payment transactions through the post office and 8 people often make payment transactions through the colector.

This is one of the factors why the use of the fintech payment application is still low / under target because there are many other payment media that are more trusted to make payment transactions, even though one of the advantages of payment through applications is the absence of transaction fees, it is different when making payments in other media that get transaction fees.

The author wants to know which of the 100 questionnaires that have been distributed have the potential and which do not have the potential to use the fintech payment application by conducting Data Mining Clustering Analysis with K-Means. The main purpose of the clustering process is to divide a set of data into groups (clusters) so that the data in one cluster have many similarities but are different from data in other clusters (Andria, et.al., 2019). This study looks at the profile of respondents, namely age, education, occupation and income to see the similarities between the data that can be calculated using various distance measurement methods. According to Murti (2017), K-Means is a partition-based clustering method, this method is very simple, starting with the selection of the number of clusters the researcher chooses to divide into as many clusters as K (2 clusters). Furthermore, as much as K of data is taken randomly from the centroid dataset which represents a cluster. Centroid is the center or midpoint of a cluster. All data are then calculated for the distance to each centroid and each data will be a member of a cluster represented by the centroid that has the closest distance to the data (Prilianti and Wijaya, 2014).

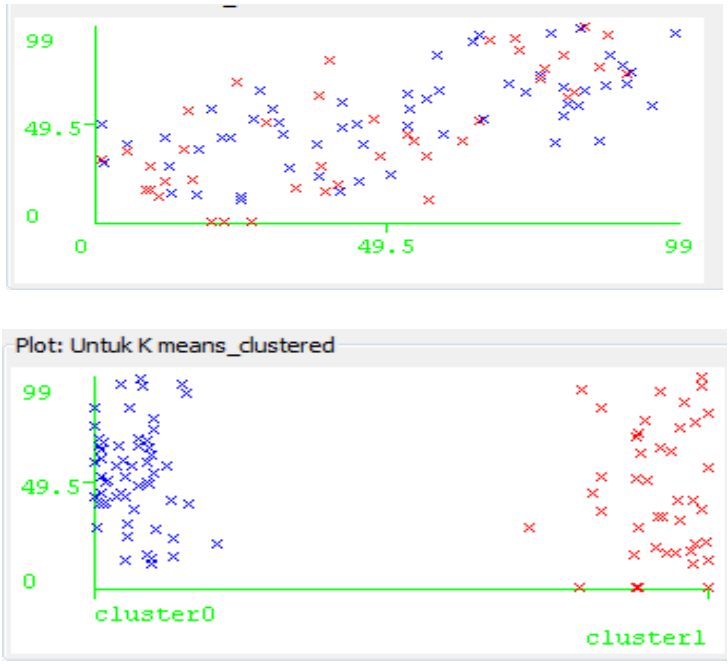

Figure 4. Distribution of Clusters and Amount of Data in Groups
Source: Primary data processed, 2020

Figure 4. Above shows the results of k-means clustering using the WEKA application, k-means is able to group 100 data into 2 clusters resulting in cluster 0 which has 58 blue dots, and for cluster 1 which has 42 red dots. To find out which clusters are included in potential and non-potential customers, it is necessary to know the characteristics of the data first. In Figure 5, Clusters 0 and 1 have the characteristics of being of various ages, as well as education at Junior high school and Senior High School has the potential to enter cluster 0 or 1, which distinguishes the respondent's last education if they are at or above Senior High School (D3, S1, S2) it is definitely considered a cluster 1 or potential customers because in cluster 0 there are no respondents who have other education. Likewise work, for private employee jobs, civil servants / retirees are certain to become cluster 1 because in cluster 0 there are no customers who have jobs as private employees, civil servants / retirees. The number of cluster 0 is more than cluster 1, which means that there are more customers who do not have the potential to use the fintech payment application than potential customers.

Furthermore, this study wants to find out how the fintech payment application can be used effectively by analyzing data mining using the C4.5 algorithm classification method. According to Salmah, et al, (2019) This method uses a

tree structure, and at each node represents an attribute, and the leaves represent the class by looking for the gain ratio by calculating Entropy. Entropy, namely the value of information from a set of objects which becomes the total cases and the total sample in the data set, which becomes the data set is how the effectiveness of using the fintech payment application will be used in calculating the C4.5 algorithm. The initial data will be divided by class to facilitate analysis. The WEKA application will be used. 3.7 After all the data to be entered are divided by class, the classification process is carried out by making a decision tree as the output. The decision-making process to determine the effectiveness of using applications is as follows (Adzima and Ariyanti, 2018):

- Trust
- Perceived Value
- Perceived ease of use
- Social Influence
- Intention to use

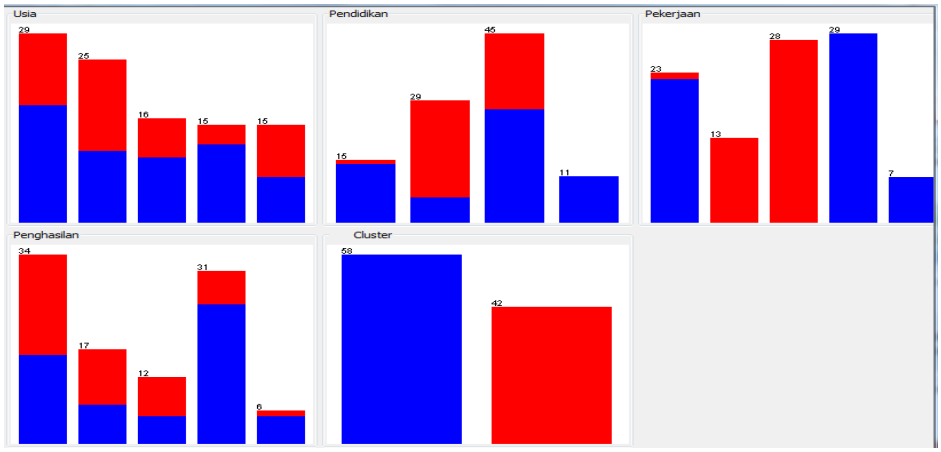

Figure 5. Distribution of Clusters 0 and 1 Based on Respondent Profiles
Source: Primary data processed, 2020

In the testing phase, the data has been transformed into simpler attribute data. The data used in this study are the results of questionnaires from respondents, namely customers who use or do not use the fintech application with the five sub-variables that can cause the effectiveness of using the application. Furthermore, from 100 respondents with the five sub-variables, each entropy value and gain will be calculated in order to obtain the attributes of the decision tree. After getting the entropy and gain values, the next step is to process the data using the WEKA 3.7 application (Tosida, et. al., 2019).

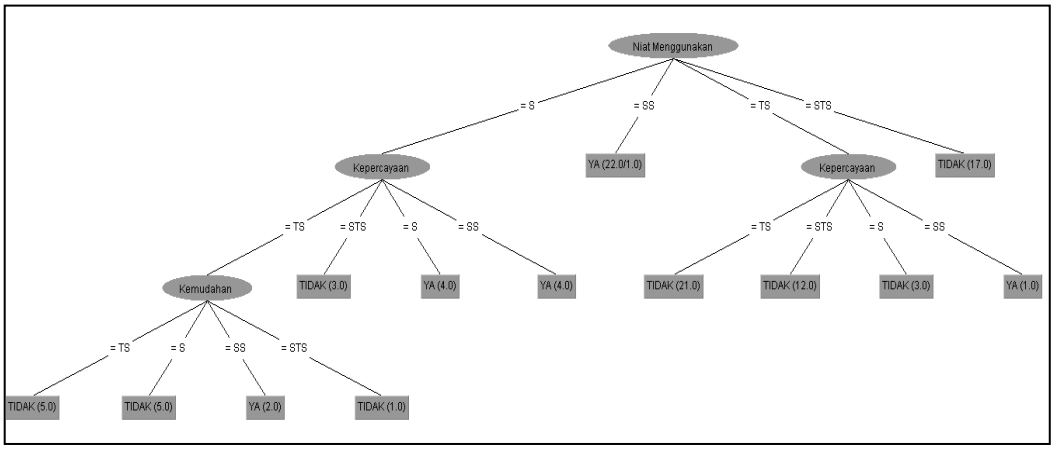

Figure 6. Decision Tree Structure with WEKA 3.7
Source: Primary data, processed in 2020

Data that has been processed and tested using the WEKA 3.7 application in the data set results in the compilation of information in the form of a decision tree as shown in Figure 6. Figure 6. shows that the use intention variable represents the root node of the tree. If the customer strongly agrees to use the fintech application as soon as possible, the classification will show YES, this can make the use of the application effective. On the other hand, if the customer strongly disagrees to adopt the application immediately, the classification results show NO, which means that this makes the fintech application ineffective. However, if the customer does not agree to adopt the application, because there are sub-variables of trust that affect the customer. Trust if the customer feels strongly that he is not afraid of fraud and hacking, then the classification results show YES. However, if the customer answers agree, disagrees and strongly agrees, the classification will show NO, which means the customer will not use the fintech application and it means the application will not run effectively.

If the customer agrees to have the intention to use but does not believe in the application because it is influenced by the convenience sub variable, the customer who strongly agrees with the application makes it easy to show the YES classification. If the customer only agrees, disagrees and strongly disagrees if the application can provide convenience in transactions, the classification will result in NO, which means the customer will not use the fintech application. Even though the customer agrees that the fintech application makes it easy to carry out payment activities, the classification results show NO because one of the causes is according to several complaints from respondents who have made transactions through the application, namely:

- An error occurred in the system, the balance has been deducted but the installments are still not reduced.
- It is difficult to log in even though you have downloaded and want to try using the application.
- Have the desire to make transactions through the application but do not have an account which is the main requirement for making transactions on the fintech application.
- The fintech payment application makes it easy but doesn't trust you to use it for fear of fraud.

The study used five sub-variables, but after processing data using WEKA 3.7 there were only 3 variables that could affect customers in using fintech applications, namely the sub-variables of intention to use, trust, and convenience. When viewed from the pattern of the final decision tree shows quite good results, as evidenced by the accuracy value which reaches 90%.

5. Conclusion

Based on the research results, it can be concluded that 53% of PT XYZ customers who are conducting payment transactions at branch offices already know the fintech payment application because there are banners, posters and brochures stored next to the queue number collection, but only 13 people have ever used / just used it. download. Another obstacle is that as many as 40% of customers do not have a bank account, which means they cannot make payments via the fintech application. The large number of payment media options also causes the use of fintech payment applications to be few, because apart from branch offices, customers tend to make payments through mini-market media for reasons that are close to home, even though the payment will be subject to a transaction fee of IDR 7,500 - 8,000.

Higher education in Cluster 1 which is dominated by Senior High School and Others (D2, D3, S1 / S2) is considered to have the potential to use the fintech payment application, because higher education also affects customers in using online payment technology. In addition, because cluster 1 is in higher education, jobs in this cluster are dominated by private employees and civil servants / retirees and are considered to have the potential to use fintech payment applications. Income in dominant cluster 1 is higher than cluster 0, which means it is more likely that respondents have a bank account to save their money. Once the respondent has an account, it will make it easier for companies to transfer payment transactions so that they become potential customers using fintech applications.

Based on data mining analysis with the C4.5 algorithm that uses processing through the WEKA 3.7 application, of the 5 existing sub-variables, there are only 3 that determine the effectiveness of using the fintech payment application, namely:

- Intention to Use
- Trust
- Convenience

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