

**COMPARATIVE ANALYSIS OF CUSTOMER SATISFACTION BETWEEN PREPAID AND POSTPAID ELECTRICITY IN MANADO***ANALISIS KOMPARATIF DARI KEPUASAN PELANGGAN ANTARA LISTRIK JENIS PRABAYAR DAN PASCABAYAR DI MANADO*

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**Abstract:** There are still many people who are loyal and do not want to switch to prepaid electricity services, this can happen because of the excess of postpaid electricity is that people do not need to get ready to buy electric pulses because the electricity is always available and also not all people especially the household sector have high incomes and must at any time have the funds to buy electricity pulse when the pulse electricity runs out. The purpose of this research is to know the comparison of customer satisfaction on prepaid electricity and postpaid electricity in Manado. This study uses quantitative research and Independent Sample T-test as a tool to analyze the data that has been collected from questionnaire that distributed to 100 respondents as sample of this research. The findings of this study show that there are differences of customer satisfaction from different users. Based on the result, the researcher provided several recommendations which are: making improvement regarding the machines which can be considered as old and change it into a new one, do evaluation regarding errors that may happen and do prevention regarding the errors, also have check and balance system regarding the amount of electricity in order to prevent shortage of power.

**Keywords:** customer satisfaction, comparative analysis, service quality, product quality, price

**Abstrak:** Masih banyak masyarakat yang loyal dan tidak mau beralih ke layanan listrik Prabayar, hal ini dapat terjadi karena kelebihan listrik pasca bayar adalah masyarakat tidak perlu bersiap-siap untuk membeli pulsa listrik karena listrik selalu tersedia dan juga tidak semua orang terutama sektor rumah tangga berpenghasilan tinggi dan setiap saat harus memiliki dana untuk membeli pulsa listrik saat pulsa listrik habis. Tujuan dari penelitian ini adalah untuk mengetahui perbandingan kepuasan pelanggan pada listrik Prabayar dan listrik Pascabayar di Manado. Penelitian ini menggunakan penelitian kuantitatif dan Independent Sample T-test sebagai alat untuk menganalisis data yang telah dikumpulkan dari kuesioner yang dibagikan kepada 100 responden sebagai sampel penelitian ini. Temuan penelitian ini menunjukkan bahwa ada perbedaan kepuasan pelanggan dari pengguna yang berbeda. Berdasarkan hasil tersebut, peneliti memberikan beberapa rekomendasi yaitu: melakukan perbaikan terhadap mesin-mesin yang dianggap sudah tua dan menggantinya dengan yang baru, melakukan evaluasi terhadap kesalahan yang mungkin terjadi dan melakukan pencegahan terhadap kesalahan tersebut, serta melakukan pengecekan dan sistem keseimbangan mengenai jumlah listrik untuk mencegah kekurangan daya.

**Kata Kunci:** kepuasan pelanggan, analisis komparatif, kualitas servis, kualitas produk, harga

## INTRODUCTION

### Research Background

Marketing is needed by companies to promote sales of company products in the form of goods or services. The role of marketing in the company is very important to improving their selling system. Therefore, customer satisfaction is part of marketing that need to be taken into account. Nowadays, human activity has been dependent and facilitated by technology that has sophisticated. The technology is in the form of electronic goods that use electricity as energy sources. Electricity is an important thing that cannot be separated from human activities at this time. In order to fulfill electricity needs of society, government through PT. PLN (Persero) provides services related to electricity. PT. PLN (Persero) as state-owned enterprises is a provider of electricity for public purposes. There are two types of electricity used by society such as Prepaid Electricity and Postpaid Electricity. So far, PLN customers get postpaid electricity services, that is, customers use electricity first and pay later in the end of month. In this services, PLN must record meters every month, calculate and issue accounts to be paid by customers, bill customers who are late or not paying, and cut off electricity if consumers are late or do not pay electricity bills after a specified time.

It is undeniable that almost all people living in urban areas has got electricity supply, include Manado. The total number of electricity customers in Manado are 301.855 for prepaid customers and 199.510 for postpaid customers. The customers of prepaid electricity is higher than postpaid electricity's customers. Just imagine, based on the total number of electricity customers means a lot of people already use prepaid electricity, however, there are people who still use postpaid electricity. Both of prepaid and postpaid electricity, each has advantages and disadvantages. Considering there are many problems in postpaid electricity services that are detrimental to customers and PT. PLN itself, for example, the problem of frequent power failures but the electricity costs must still be paid by the customer. Furthermore, electricity theft is detrimental to PT. PLN, and also the number of late payment of electricity by customers. These things makes PT. PLN more recommending to use prepaid electricity. Prepaid electricity is inseparable from criticisms and suggestions that appear from the customers. There are still a lot of public complaints related to this Prepaid Electricity system, whether in terms of the service system, the responsiveness of the PLN officers themselves in carrying out their duties, or in terms of the quality of the prepaid electricity meter. On the other hand, the customer also feels helped by the prepaid electricity system.

However, till now there are still many people who still use postpaid electricity. There are still many people who are loyal and do not want to switch to prepaid electricity services, this can happen because of the excess of postpaid electricity is that people do not need to get ready to buy electric pulses because the electricity is always available and also not all people especially the household sector have high incomes and must at any time have the funds to buy electricity pulse (token) when the pulse electricity runs out. In comparison, there is a fixed cost that need to be paid for the postpaid users. Meaning the users need to pay amount of money even though the electricity usage is not that big, it may bring problems toward people that live under the poverty line. This is one of the reason PLN give the solution to use prepaid electricity, because the users can freely negate this problem and can freely choose the number of electricity that they want to use. This research will be describing and explained about how satisfy the customer on prepaid electricity and postpaid electricity, and the comparisons of customer satisfaction on prepaid electricity and postpaid electricity; with the current condition of both ways of electricity payment are available means the research can have a more in-depth look regarding the current situation.

### Research Objective

The research objective is to know the comparison of customer satisfaction on prepaid and postpaid electricity in Manado.

## THEORETICAL FRAMEWORK

### Marketing

Marketing is needed by companies to promote sales of company products in the form of goods and services. Companies do various ways to promote their products to the public so that their products can be recognized and in demand by the public, therefore, people are interested to buy and use these products. The role of marketing in the company is very important to improving their selling system. In 1980, Philip Kotler defined

marketing as satisfying needs and wants through an exchange process. Along with times, Kotler has evolved his definition of marketing. Marketing is the process by which companies engage customers, build strong customer relationship, and create customer value in order to capture value from customer in return (Kotler and Armstrong, 2018). So, it can be defined that marketing is a system of business activities to planning, distributing and promoting goods and services to fulfill the wants and needs of consumers carried out by the company.

### **Customer Satisfaction**

Customer satisfaction is an important thing and the main concept in theory and marketing practice in this era. Customer satisfaction indicates the fulfillment that customers derive from doing business with a firm. Customer satisfaction is defined as a measurement that determines how happy customers are with a company's product, services, and capabilities. Customer satisfaction is an overall customer attitude towards as receive, regarding the fulfillment of some need, goal or desire (Hansemark and Albinsson, 2004). There are two important questions to ask when establishing customer satisfaction which are who are the customers and what does it take to satisfy them. Customer satisfaction information, including surveys and ratings, can help a company determine how to best improve or changes its products and services. According to Zeithaml and Bitner (2012), customer satisfaction is influenced by customer perception of service quality, product quality, price, and by situational factors and personal factors.

### **Service Quality**

A service is any act or performance offered by one party for the benefit of another party that has intangible nature and does not lead to transfer of ownership (Kotler, 2012). Tjiptono (2012) defined service quality is a measure of how good the level of service provided is able to accordant with customer expectations. According to Kotler and Keller (2012), there are five factors to determine service quality which are tangibles, empathy, responsiveness, reliability, and assurance.

### **Product Quality**

Product Quality is the ability of a company to provide characteristics to each product, so, consumers can recognize the product (Schiffman and Kanuk, 2007). Customers nowadays hailed the quality of the products; often making comparisons from one product to another in order to get the best one. According to Tjiptono (2008), there are eight dimensions of product quality which are performance, durability, conformance to specifications, features, reliability, aesthetics, perceived quality, and serviceability.

### **Price**

In 2001, Kotler and Armstrong defined price is the amount of money charged for a product or services, or the amount of value that consumers exchange for the benefits of owning or using the product or services. Price become one of the essential aspects that considered by the customers because customers tend to look upon the value that they can get with the amount of expenses that they need to do; the customers will have satisfaction if the amount of payment will be worth it with the product that the customer purchased. The four indicators that characterize price which are price affordability, price compatibility with product quality, price competitiveness, and price compatibility with benefits (Kotler and Armstrong, 2018).

### **Previous Studies**

Rasyida Leila Ramadlana and Mukhamad Najib (2016) aimed to determine the level of importance and level of satisfaction in postpaid and prepaid electricity, the relationship between characteristics and customer satisfaction and differences in customer satisfaction with service quality. The analytical methods used are descriptive analysis, Importance Performance Analysis (IPA), Customer Satisfaction Index (CSI), Chi Square and T-test. The results showed that the attributes contained in quadrant A Importance Performance Matrix need to be improved so that customer satisfaction increases, the CSI value of postpaid electricity programs and prepaid electricity programs is considered to have satisfied customers, the results of the Chi-Square test are known to have a sex correlation with satisfaction with prepaid electricity customers and the results of the T-test show that prepaid electricity customer satisfaction is higher than postpaid electricity customer satisfaction.

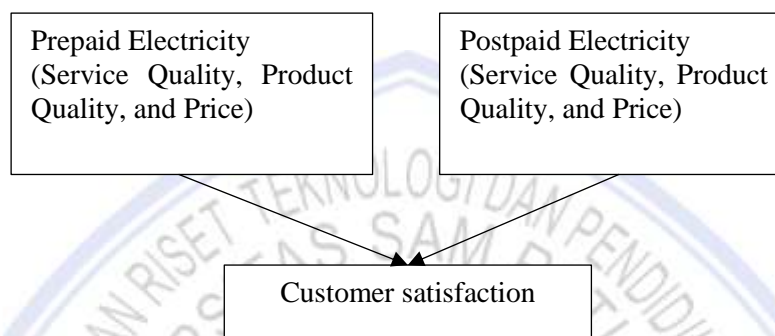
Milijanka C. Ratkovic, Marko Pavlovic, Maja Z. Andelkovic (2017) in a comparative analysis of customer satisfaction towards postal and banking services in Serbia. In addition, this paper should provide guidance on how managements of the Post Office and the Bank should behave on the market. The survey was conducted throughout the whole Serbian territory. The subject of the research is to measure the perception of



postal and banking services, in order to assess the quality of services and the impact of expectations on the level of perceived quality. Testing and final conclusions about the level of quality of postal and banking services was carried out on the basis of the existing literature and modified SERVQUAL model.

Nebojsa Vasic, Milorad Kilibarda, and Tanja Kaurin (2019) developed the research model to determine the impact of certain online purchase determinants on the consumer satisfaction in the market of Serbia. A conceptual model is defined, consisting of 26 items categorized into seven variables: security, information availability, shipping, quality, pricing, time, and customer satisfaction. Input model parameters were collected through surveys, with the aid of appropriate Internet tools. The validity of the developed model was verified through the Confirmatory Factor Analysis and the Partial Least Squares. The obtained result analysis confirmed the basic research hypotheses that customer satisfaction in online shopping, on the Serbian market, directly depends on the following determinants: security, information availability, shipping, quality, pricing and time.

### Conceptual Framework



**Figure 1. Conceptual Framework**

*Source: Data Processed, 2021*

## RESEARCH METHOD

### Research Approach

This research used quantitative approach. The quantitative approach is especially useful for addressing specific questions about relatively well-defined phenomena. The reason why this research used a quantitative approach is will enable for researcher to take notes and process data involving figures and scores, or scores from questionnaires for statistical analysis about comparative analysis of customer satisfaction between prepaid and postpaid electricity.

### Population, Sample, and Sampling Technique

Population is the generalization area which consists of objects or subjects that have certain qualities and characteristics that are determined by the researcher to be studied and then draw conclusions (Sugiyono, 2015). The population of this research are the entire customer of prepaid and postpaid electricity in Manado. The data from PT. PLN (Persero) UP3 Manado it shows that there are around 501.365 users of electricity that spread across 11 sub-districts in Manado. Sample is part of the number and characteristics of the population. The sample size uses 100 people consists of 50 customers of prepaid electricity and 50 customers of postpaid electricity in Manado. In this research, the sampling technique uses purposive sampling. Purposive Sampling is the part of non-probability sampling.

### Data Collection Method

Technique of primary data collection uses questionnaire. The questionnaire will be distributed to respondents who are the customers of prepaid and postpaid electricity and filled out by them. The questionnaire will be measured based on the indicators, which are service quality, product quality, and price.

**Operational Definition of Research Variables****Table 1. Variable Definition**

| Variable                  | Definition                                                                                                                       | Indicators                                        |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| Customer Satisfaction (Y) | Customer Satisfaction is a measure of how products and services provide by any organization meet the expectations of a customer. | - Service Quality<br>- Product Quality<br>- Price |

Source: Author's Note, 2021

**Validity and Reliability**

Validity refers to how accurately a method measures what it is intended to measure. If research has high validity that means it produces results that correspond to real properties, characteristics, and variations in the physical or social world. Reliability refers to how consistently a method measures something. If the same result can be consistently achieved by using the same methods under the same circumstances, the measurement is considered reliable.

**Independent Sample T-test**

In this study the formulation of the problem is in the form of a comparative analysis of two independent variables (not correlated), the sample is stated to be uncorrelated between the two groups, if the samples that are the object of the study can be clearly separated. T-test compares the means of two variables. This test is done by comparing the t-value with t-table (Samuels, 2014). The level of significance is 5% ( $\alpha = 0.05$ ). If t-value is greater than t-table hypothesis is accepted. Independent sample t-test uses variance between two samples compared not significantly different.

**RESULT AND DISCUSSION****Result****Validity and Reliability****Table 2. Validity Test**

| Variable | Indicators      | Pearson Correlation | Sig. (2-tailed) | N   | Status |
|----------|-----------------|---------------------|-----------------|-----|--------|
| Prepaid  | Service Quality | .713                | 0.000           | 100 | Valid  |
|          | Product Quality | .791                | 0.000           | 100 | Valid  |
|          | Price           | .826                | 0.000           | 100 | Valid  |
| Postpaid | Service Quality | .677                | 0.000           | 100 | Valid  |
|          | Product Quality | .764                | 0.000           | 100 | Valid  |
|          | Price           | .787                | 0.000           | 100 | Valid  |

Source: SPSS Output (2021)

Table 2 shows that all statement of the indicators of service quality, product quality and price both by prepaid and postpaid users have a significant value that is below 0.5%, which means that all statements are considered valid.

**Table 3. Reliability Test for Prepaid and Postpaid Users**

|                | Cronbach's Alpha | N of items |
|----------------|------------------|------------|
| Prepaid Users  | .849             | 12         |
| Postpaid Users | .775             | 12         |

Source: SPSS Output (2021)

From the result above shows that the data is considered as reliable because the value of Cronbach's Alpha are 0.849 for prepaid and 0.775 for postpaid which are above 0.6.

**Normality Test****Table 4. Normality Test**

| <b>One-Sample Kolmogorov-Smirnov Test</b> |                |                   |                     |
|-------------------------------------------|----------------|-------------------|---------------------|
|                                           |                | <b>totalFT</b>    | <b>totalO</b>       |
| N                                         |                | 30                | 30                  |
| Normal Parameters <sup>a,b</sup>          | Mean           | 103.70            | 91.80               |
|                                           | Std. Deviation | 9.315             | 11.205              |
| Most Extreme Differences                  | Absolute       | .153              | .105                |
|                                           | Positive       | .087              | .055                |
|                                           | Negative       | -.153             | -.105               |
| Test Statistic                            |                | .153              | .105                |
| Asymp. Sig. (2tailed)                     |                | .072 <sup>c</sup> | .200 <sup>c,d</sup> |

a. Test distribution is normal

b. Calculated from data

Source: SPSS Output (2021)

Table 4 shows that the significant column for prepaid is 0.072 and for postpaid is 0.200 which means above 0.05. It means the data is normally distributed.

**Group Statistic Result****Table 5. Group Statistic**

|              | <b>Customers</b> | <b>N</b> | <b>Mean</b> | <b>Std. Deviation</b> | <b>Std. Error Mean</b> |
|--------------|------------------|----------|-------------|-----------------------|------------------------|
| Customer     | Prepaid          | 100      | 103.70      | 9.315                 | 1.701                  |
| Satisfaction | Postpaid         | 100      | 91.80       | 11.205                | 2.046                  |

Source: SPSS Output (2021)

Table 5 shows that the difference of total variable between prepaid and postpaid customers. It shows that the total mean of prepaid customers is 103.70 while the total mean of postpaid customers is 91.80. It can be concluded that in this case total prepaid customers is higher than total postpaid customers.

**Independent Sample T-test****Table 7. Independent Sample T-test of Prepaid and Postpaid**

|              |                             | <b>Levene's Test for Equality of Variances</b> |             |          |           | <b>t-test for Equality of Means</b> |                  |                        |                                                  |              |              |
|--------------|-----------------------------|------------------------------------------------|-------------|----------|-----------|-------------------------------------|------------------|------------------------|--------------------------------------------------|--------------|--------------|
|              |                             | <b>F</b>                                       | <b>Sig.</b> | <b>t</b> | <b>df</b> | <b>Sig. (2-tailed)</b>              | <b>Mean Diff</b> | <b>Std. Error Diff</b> | <b>95% Confidence Interval of the Difference</b> |              |              |
|              |                             |                                                |             |          |           |                                     |                  |                        |                                                  | <b>Lower</b> | <b>Upper</b> |
| Customer     | Equal Variances             | 1.074                                          | .304        | 4.47     | 58        | .000                                | 11.900           | 2.660                  | 6.575                                            | 17.225       |              |
|              | Assumed Equal Variances     |                                                |             | 4.47     | 56.12     | .000                                | 11.900           | 2.660                  | 6.571                                            | 17.229       |              |
| Satisfaction | Equal Variances not Assumed |                                                |             | 4.47     | 8         | .000                                | 11.900           | 2.660                  | 6.571                                            | 17.229       |              |
|              | Assumed Equal Variances     |                                                |             | 4.47     | 56.12     | .000                                | 11.900           | 2.660                  | 6.571                                            | 17.229       |              |

Source: SPSS Output (2021)

The criteria of the t-test are as follows:

- Sig. (2-tailed) < 0.05 means  $H_0$  is rejected and  $H_1$  is accepted and it also means that there is significant between those two groups.
- Sig. (2-tailed) > 0.05 means  $H_0$  is accepted and  $H_1$  is rejected and it also means that there is no significant difference between those two groups.

From the results above, it shows that the t value is 4.473 with the value of sig. (2-tailed) is 0.000. By seeing these results the decision is to accept  $H_1$  and reject  $H_0$  because the significant 2-tailed of 0.000 is less than 0.05. The conclusion can be drawn that there is a significant difference between the customer satisfaction

between prepaid and postpaid users of PLN electricity service with all the indicators which are service quality, product quality and price. It means that both either pre-paid or post-paid users have their own preference in terms of satisfaction which include these indicators as measurement. The different within the usage implementation of pre-paid and post-paid proves to have different outcome too.

### Discussion

This research aims to know the comparison of customer satisfaction on prepaid electricity and postpaid electricity in Manado. The result of this research shows that based on Independent Sample T-test using SPSS, shows that the t-value are 4.473 with the value of significance are 0.000 which means t-value is greater than t-table and the significance value is less than 0.05. Therefore, it is proven that there a significant difference of customer satisfaction between prepaid and postpaid users of PLN electricity service with all the indicators which are Service Quality, Product Quality and Price. It means that both either prepaid or postpaid users have their own preference in terms of satisfaction which include these indicators as measurement. The different within the usage implementation of prepaid and postpaid proves to have different outcome too.

1. Prepaid Electricity. Prepaid electricity is an electricity service that allows customers to control their own electricity usage according to their needs and abilities. Prepaid electricity is electricity whose payment is at the beginning, which is with a pulse system. Electric meter is not use analog device, but digital device that can be used to enter the electric charging code. The system is made like buying prepaid mobile phone pulses to make it easier for users. Another advantage of this prepaid electricity is that there is no need to worry about late payments. The price of prepaid electricity varies according to the abilities and needs of consumers (electric power).
2. Postpaid Electricity. Postpaid electricity is electricity that bills at the end of month according to the energy used. Postpaid electricity meter still uses an analog device that shows the amount of power that has been used. Postpaid electricity payments can be paid through banks, payment counters with admin fees that are charged as electricity bill payment service fees.
3. Service Quality. The research shows that there is difference between prepaid and postpaid users in term of customer satisfaction, in this particular case service quality act as one of the indicators. For prepaid, the customers have the freedom to choose whether or not to pay for the electricity. The users do not need to go to the office directly to pay for electricity, meaning that prepaid users do not have much experiences in term of service quality because basically the users can determine their own way of paying the bills. For postpaid, the customers will eventually need to go to the office or store directly and need to face the customer service.
4. Product Quality. The research shows that there is difference between prepaid and postpaid users in term of customer satisfaction, in this particular case product quality act as one of the indicators which focus more on performance aspect. For the prepaid, product quality tends to be better because the only error that the users may encounter is blackout caused by disaster or maintenance from the central office. Different from postpaid users than may encounter other problem such as error that can be found from the machine because of the age and also the limitation of electricity usage that might happen.
5. Price. The research shows that there is difference between prepaid and postpaid users in term of customer satisfaction, in this particular case the prices which differ in terms of usage and also adjustment that can be made by the users. For prepaid users, the customers can adjust their usage of electricity by buying the desired token which can make a cheaper accumulative price in the end. For postpaid users, the prices can only be seen at the end of the month. Other problem also regarding tracking the usage of electricity per month, postpaid users do not have the same benefit as the prepaid users. There are many cases where postpaid users need to adjust their financial conditions because of over-paid because they cannot track the usage of their current electricity.

## CONCLUSION AND RECOMMENDATION

### Conclusion

1. There are significant difference in terms of customers satisfaction for pre-paid and post-paid users. The research conducted using 3 main indicators which are service quality, product quality and price.
2. In the case of service quality, there are possibilities of satisfaction and dissatisfaction in term of the service quality that will be given, at the end of the day different types of payment can be the difference for both of the users.



3. The main explanation of difference in terms of product quality can be found in the error which can be occurred on both services; despite coming from the same company both services have pro and cons. Different types of errors may lead to satisfaction in certain degree; but also create dissatisfaction which happen toward both types of users.
4. The explanation regarding prices of electricity in this case is about the adjustment and the overall payment for electricity usage; prepaid and postpaid give different perspective in terms of prices. In prepaid the idea of saving money and monitoring the usage of electricity are exist while postpaid users cannot experience the same way. These findings prove there are differences of customer satisfaction from different users.

### Recommendation

1. In order to create the same level of customer satisfaction for both users, PLN need to do improvement within their products and service as well. The company can make improvement regarding the machines which can be considered as old and change it into a new one, do evaluation regarding errors that may happen and do prevention regarding the errors, also have check and balance system regarding the amount of electricity in order to prevent shortage of power for the users. In term of service, company can improve the quality of customer service and also the quality of people that do service as well.
2. For the customers, it is suggested that the customers need to adjust according to the financial status from each person. The usage of pre-paid token bring much more advantage in term of monitoring power usage and also saving money in order to fulfill other needs, while post-paid bring the idea of existence of electricity without need to considering doing top-up.

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