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Analysis Of Factors Inhibiting Employees From Reading Kwh Post-Paid Meters In The Field (PT. IDO SINERGI)

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ABSTRACT

PT. PLN (PERSERO) as a State-Owned Enterprise to provide the best service for all electricity users in Indonesia, PLN which takes care of all aspects of electricity for the public interest throughout Indonesia. At first PLN used postpaid electricity kwh recording calculating tool, where the kWh meter recording used analog system. Several problems and complaints from the public regarding the use postpaid electricity in the form of late payments, meter recording errors and erratic bills, PLN specifically for the Sorong branch in collaboration with PT. Ido Sinergi as a service provider, especially in the work of recording kwh meters, must be able to provide satisfaction to PLN as its partner. When recording kwh meters, factors that often hinder activities in the field such as fence locks, closed houses, empty houses, tall meters, opaque meters, fierce animals, unloading meters, lost meters other unexpected factors. The purpose this study to find out the various factors inhibiting kWh meter readings in the field, the data obtained was then processed using data analysis tool used to answer the research problem using the Pareto Diagram. The conclusion from this study is that the inhibiting factors for reading kwh meters in the field are fence locks, closed houses, empty houses, tall meters, opaque meters, fierce animals, unloading meters, missing meters with a total of 598 constraints from 20,580 customers, along with the percentage pk 31%, rt 13%, rk 15%, mt 7%, mbrm 15%, hg 3%, mb 10%, mh 7%.

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INTRODUCTION

The increasing development of technology in the era of globalization can make it easier for people to meet their personal needs. PT. PLN is aware of the electricity needs of people who are increasingly dependent on electricity by pursuing various research to improve service quality. Over time and to develop the services of a company, innovation is created to sustain the existence, progress, and growth of the company in providing services to the community [1]. According to Bitner, Zeithaml, and Dwayne (2013), satisfaction is a customer's assessment of whether their needs and desires for a product or service are met. According to PT PLN (2006) until 2007, PT PLN's system (PERSERO) aimed to meet customers' needs to first use electric energy and then pay bills in cash based on the amount of electricity used [2].

Some of the public issues and complaints related to postpaid electricity usage include late payments, meter registration errors and unreported bills. PT. PLN (PERSERO, especially the Sorong branch, cooperates with PT. Ido Sinergi, as a service provider, especially recording the work of kWh meters, must be able to satisfy PT. PLN (PERSERO) as a working partner and demonstrating quality performance. At work there are definitely problems getting things done. Especially in the current era of globalization, the needs of service companies are increasingly high and their professionalism depends on their respective fields [3]. Electricity is force or energy created by friction or chemical processes that can produce heat, light, or move machinery [4].

Post-paid electricity Until now, PLN customers have benefited from post-paid electricity services, meaning they use electric energy in advance and change the payment the following month. Every month, PLN must register meters, calculate and issue bills customers must pay, collect money from customers who are late or do not pay, and cut off electricity if consumers are late or do not pay electricity bills later. a specific time. Prepaid electricity. The above-mentioned mechanism is not implemented on prepaid system. Prepaid electricity is a new way for PLN customers to manage their electricity consumption by purchasing, using and controlling Strom (electric energy charging) according to their needs and desires. The amount of electricity purchased by the customer is entered into the prepaid meter (MPB) installed at the customer through the sanitation system (token or credit). The ticket is a unique 20-digit number and contains information that needs to be entered into the prepaid kWh meter to still be usable [5].

A Kwh-meter, short for kilowatt hour, is a tool to measure the amount of energy used by the power meter each hour. Initially, the function of the kWh meter was to calculate electrical energy consumption in an analog way, displaying it in digital form. With advancements in technology, it is possible to design a kWh meter that can also display the rupee value to be paid in the form of electricity consumption bill [6].

Monitoring system Monitoring system includes 2 (two) words: systems and monitoring. According to Jogiyanto (2005), a method is a network of interconnected procedures to carry out an activity or to achieve a specific goal. The system has specific characteristics or properties: System components, system boundaries, system external environment, system connectors, system inputs, system outputs, system processes, and system goals [7].

According to Cassely and Kumar (1987), monitoring is an integrated program, an essential element of good management practice and an integral part of day-to-day management. Meanwhile, according to Calyton and Petry (1983), monitoring is the process of measuring, recording, collecting, processing and reporting information to support program/project management decision making. A monitoring system is a network of interconnected processes that record, measure, manage, process, monitor and communicate information from each stakeholder to help make management decisions. program or project management within a business or organization [8].

The kWh meter, a tool for calculating electrical energy consumption, works by means of magnetic induction, in which a magnetic field moves a metal disc. The main parts of the KWH meter are the voltage coil, the current coil, the aluminum disc, the fixed magnet and the mechanical gear that records the number of revolutions of the aluminum disc. If the meter is connected to a single-phase power source, the disc receives a torque that can make it rotate like a motor with high precision. Below is a construction drawing of an analog touch-type kWh meter. A digital kWh meter is a measuring tool with the same main function as an analog kWh meter, measuring energy or power used in a unit of time. If the analog kWh meter operates by touch, the digital kWh meter operates according to a program designed on the microprocessor of the digital kWh meter [9].

Electrical energy is needed for equipment to control engines, fly, cool, heat, or reactivate mechanical devices using other types of energy. Basic digital kWh meter, the voltage and current received by this digital kWh meter are read separately. The incoming voltage will be read and then transmitted to the microcontroller. The current reading will also be sent to the microcontroller. In the microcontroller, a program has been defined to process the incoming voltage and current into one quantity. The quantities mentioned are active power and energy. So, with this digital kWh meter you can read the energy consumed [10].

Before calculating costs on an analog kWh meter, things to consider [11]:
1. Rotation of the kWh Plate.
The more electrical equipment you use, the faster the kWh meter will rotate. That means the active power (watts) you use will also increase, which means the number on the kWh meter stand will grow more quickly.

2. The speed of rotation of the kWh meter disk. This is what we will calculate with a stopwatch. To calculate the process of the kWh meter disk, you must pay attention to the black mark on the kWh meter disk. This black mark is the benchmark for starting and stopping when counting the rotation of the kWh meter disc.

3. Constant of the kWh Meter.
Look at the kWh meter nameplate, there you will find many specifications of the electricity meter. The units always follow the constant kWh Meter Turns/kwh or put/ kWh. For example, the constant is 900 Put/kWh. This means that to produce 1 kWh on the meter stand, the kWh disc must rotate 900 times. The kWh meter constant varies, so you must look directly at the kWh meter nameplate.

RESEARCH METHODS

This research was conducted at the company PT. Ido Sinergi, which operates in the field of kwh meter reading services.

1.Research topic
Based on the problems that exist in the process of recording meters in the field, an improvement solution is needed, therefore the author will conduct research on factors that often occur by officers in the field using the Pareto diagram method.

2. Research objectives
To find out various factors in kWh meter readings in the field.

3. Data collection
The data taken in this research is data from respondents from kWh meter recording officers at PT. Ido Sinergi, as well as data collection techniques carried out using questionnaires, interviews, observation, documentation and conducting literature studies.

4. Data analysis

The data obtained is then processed using data analysis tools based on the description above, so I am interested in conducting final research on postpaid kWh meter readings.

The following are the results of research on the analysis of factors inhibiting employees from reading postpaid kwh meters in the field.

1. Influence of employees reading postpaid kWh meters in the field, results from research on employees reading postpaid kwh meters.

   Description:
   1. PK: KEY FENCE
   2. RT: HOUSE IS CLOSED
   3. RK: THE HOUSE IS EMPTY
   4. MT: HIGH METER
   5. MBRM: opaque meters
   6. HG: FIERCE ANIMALS
   7. MB: UNLOADING METER
   8. MH: METER LOST

Tabel 1. Observation Result

Name	PK	RT	RK	MT	MBRM	HG	MB	Cumulative	Percentages
Arnol	14	10	10	5	11	0	5	60	10%
Alex	9	4	14	6	9	0	7	52	9%
Boy	8	12	6	2	12	1	3	45	8%
Devito	14	5	5	6	8	1	4	49	8%
Febri	24	16	10	9	23	10	7	101	17%
Frendo	2	4	8	1	4	0	5	48	8%
Fandro	19	7	7	2	5	2	6	54	9%
Fiktor	30	3	10	2	10	1	8	68	11%
Anto	21	6	11	3	4	4	6	60	10%
Salim	24	8	6	3	4	1	8	61	10%
TOTAL									100%

Tabel 2. Data Processing Results

Type	Amount	%	Cum %
PK	185	31	31
RT	75	13	43
RK	87	15	58
MT	39	7	65
MBRM	90	15	80
HG	20	3	80
MB	59	10	93
MH	44	7	100

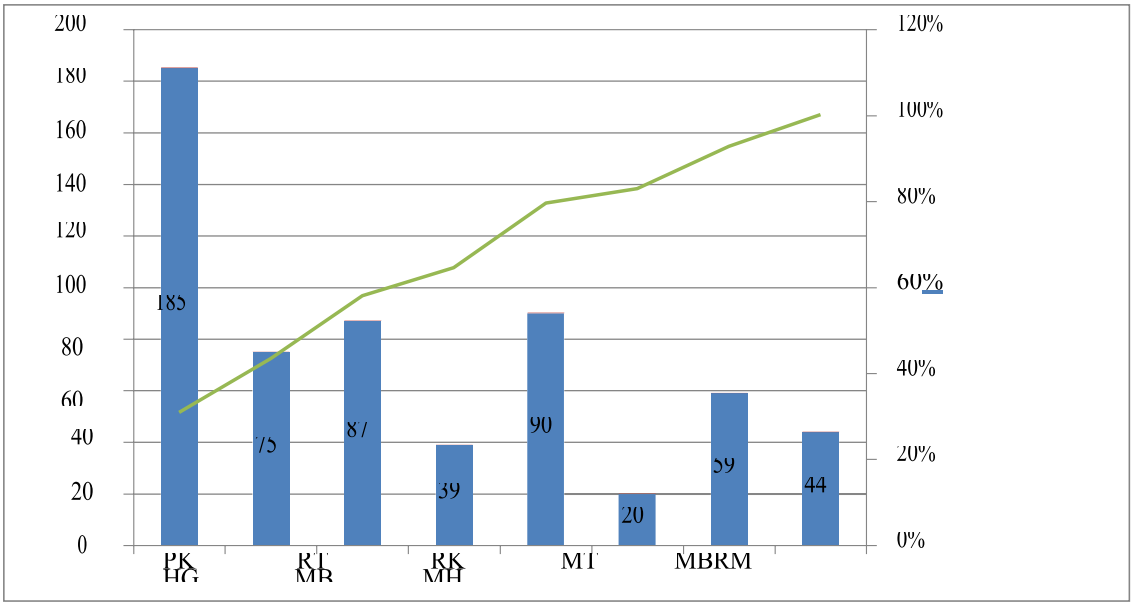

Figure 1. Pareto Diagram

2. Work System

PT. Ido Sinergi has five (5) working days a week, namely Monday to Friday. Meanwhile, for the postpaid kWh meter reading schedule, the working hours are every Monday to Saturday except for major holidays (red dates). Details of working hours are as follows:
a. Field employees: Monday-Saturday 08.00-17.00 WIB Break: 12.00-13.00 WIB.
b. Verifier section employees: Monday-Friday: 09.00-12.00 WIB Break: 12.00-13.00 WIB

The workforce is 25 people. The workforce consists of a team of verifiers, officers in the field, and permanent special officers with details.
A. Month, account year
B. Position code
C. Unit code
D. Customer ID
E. Stand meter data (input)
F. Meter reading message code
G. Photo of the stand meter number
H. Record coordinates (Longitude & Latitude in decimal format).

3. Data Retrieval Mechanism

Before starting meter reading, SPV TE Rayon as Admin must set the number of reading days, power limit and running hours.

1. Download master data, customer data and stand meter data per PLN Rayon.
2. Download meter reading customer data via the officer's smartphone with an active internet network condition.
3. The meter reading process by meter reading officers in the field uses mobile. The data read by the officers is as follows.
4. Data from the meter reading results by the meter reading officer will be sent to the server via the GPRS communication network.

4. Data Collect
    1. In collecting statistical data, the first step will be an interview, which is helpful to simplify the data collection and analysis process. Apart from that, it is also beneficial for finding out problem areas. Please note that when reading a kwh meter, there may be not only one type of factor (problem), but more than one type.
    2. Asking questions in the form of questionnaires helps find out problems and obstacles in the field.
    3. Do a Crescook or go directly to the field to ensure accurate interview results.
    4. Make a diagram. The purpose of making this diagram is to the Crescook data that was collected into one and processed with data and put into a Pareto diagram so that you can see what the most dominant problems are and then see the data from the largest to the smallest.
    5. Data from the meter reading results by the meter reading officer will be sent to the server via the GPRS communication network.
    6. Verify data from the meter reading process by the meter reading coordinator/supervisor, consisting of:
        a) Verify abnormal data (Zero kWh, Max kWh, Min kWh, Minus kWh etc.).
        b) Verify Unread Data (Reread).
    7. Sending final data by the meter reading coordinator/supervisor from the ACMT DB to the AP2T DB.
    8. Validation of booth data by SPV TE Rayon.

5. Download Process
    a) The download process on ACMT mobile can now be done H-1 starting from the reading date, downloads can be done at 20.00 WIB.
    b) If the login process is successful, the DPM data download will automatically occur, accompanied by a progress bar showing the number of customers downloaded from the total customers downloaded to the officer's device (HP).
    c) DPM data successfully downloaded can be seen in Data Recap.

RESULTS AND DISCUSSION

Analysis of factors inhibiting employees from reading postpaid kWh meters in the field is as follows:
From three months of research regarding the most dominant factors causing problems when reading postpaid kWh meters are as follows:

Number of customers = 20,580
Number of kWh meters not read = 598

Percentage of kWh meters not read:

$$\frac{598}{20580} x100$$

= 2,9

1. PK (Key Fence) = 31%
   The cause of the lock fence is the factor that customers who have a kWh meter in the house, especially if there is a fence then lock it. Most people are out of work, travelling out of town, leaving

at that time, and others don't know the officers are coming, problems like this make it very difficult for officers when carrying out kWh meter reading work because the house with the lock fence had to make the officer go back and forth. After all, the officer was required to get the meter number.

2. RT (House is Closed) = 13%
   The reason why the house is closed is that customers whose house is closed are not much different from the problem, with the critical fence factor being that customers are going to work and go shopping at the market/shop and for other needs outside, so the officers cannot get the kwh meter number inside the house. So, if something like this happens, the officer has to come back again.

3. RK (The house is empty) = 15%
   The cause of an empty house is if the house that is declared vacant is a house that is no longer inhabited and the factor in the large number of uninhabited dwellings is that the owners are no longer settled and have moved to another area, so it can be ascertained that the house is indeed empty and no longer in use.

4. MT (High Meter) = 7%
   The factor that causes the meter to be high is that there are no facilities such as selfie sticks and ladders, so officers, when carrying out the work of reading kwh meters, have some difficulty in taking pictures of the kwh meter numbers, therefore facilities such as selfie sticks and ladders are needed by officers so that when reading the kwh meter they can be photographed clearly.

5. MBR (Opaque Meters) = 15%
   The cause of the blurry meters is that currently, there is no order for officers to replace the blurry meters, therefore officers can only read kwh meters as they are. If the meter can no longer be photographed, the numbers can be declared blurry, and if our eyes can still see the numbers, then the numbers must still be included or recorded.

6. HG (Fierce Animals) = 3%
   The factor that causes fierce animals is that customers deliberately keep animals, especially dogs because they like them. They can also be trusted to protect the house from people who want to do evil to the homeowner.

7. MB (Unloading Meter) = 10%
   The cause of kWh meters being dismantled is customers who do not pay off their arrears for three months in a row, therefore kWh meters that are dismantled will be immigrated to LPB. Therefore, when reading kwh meters, sometimes there are officers who, among their customers, have had them dismantled.

8. MH (Meter Lost) = 7%
   In the Sorong City area, which has postpaid kWh meters, there are more than 20,580 who still use postpaid meters, and among the 21 officers, it is not sure that they will get more than 20,580 kWh meters because there are still more than 20,580 kWh meters for each officer who have not received the lost kWh meter because before the use of applications such as at this time.

CONCLUSION

Problems that occur in the field will be analyzed to determine various factors that often appear to officers when reading kWh meters in the area. This research has a limitation problem in clarifying the depth coverage of kWh meter readings.

Pareto diagrams compare various categories of events arranged according to size, from the largest on the left to the smallest on the right. This arrangement will help us to determine the importance or priority of the categories of events or causes of the events being studied. With the help of the Pareto diagram, these activities will be more effective by focusing on the reasons that have the most significant impact on events rather than reviewing the various causes that arise. From the field analysis results, it can be concluded that critical fences, closed houses, empty houses, high meters, blurry meters, fierce animals, dismantled meters, and lost meters are the most dominant problems when carrying out kWh meter readings.

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