# Effectiveness of e-Procurement Application Implementation to Realize Transparent and Efficient Procurement of Goods and Services at PLN (Persero)

## By

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## Abstract

PT. PLN (Persero) as one of the largest SOEs in Indonesia has been assigned by the Government to provide electricity infrastructure throughout the Republic of Indonesia. So to fulfill the mandate from the government, PLN requires policies that ensure the effectiveness and efficiency of the business process for the procurement of goods/services to run these electricity projects. PT. PLN (Persero) utilizes the e-procurement application intended to increase transparency, effectiveness, and efficiency in terms of time and cost in the process of procuring goods and services. This paper will analyze the implementation of the effectiveness of the e-procurement application at PT PLN (Persero) to realize a transparent, effective, and efficient tender process using the 6 independent variables of the ease of use, trust variables, reliability, the function of the interaction environment variables, content and information, and user satisfaction as well as privileges in assessing e-Government Quality. The method used in this study is a quantitative method with a purposive sampling survey approach with the criteria of respondents being users of e-procurement applications. Based on the results of the analysis of questionnaire tests, observations, and other supporting data, it can be concluded that the e-Procurement application has been significantly effective because it has fulfilled all the variables tested.

**Index Terms—** PLN e-Procurement Application, Transparent, Efficiency, Reliability, User Satisfaction.

## Introduction

PLN as one of the largest SOEs in Indonesia has significant expenditures and is accompanied by high dynamics of complexity in goods/services procurement that triggers transformation initiatives at PLN. PLN is a large company that has a high complexity by managing a generator of 62,832 MW with a distribution network length of 979,854 KMS, a transmission network of 58,959 KMS, with a total asset of more than 1,600 trillion and more than 80 million customers. Meanwhile, in the procurement aspect, PLN manages 18,306 procurement contracts in 2020 and 15,847 contracted vendors in 2019. Meanwhile, from a financial perspective, PLN manages a very large budget both in terms of the Investment Budget and Operational Budget.

In line with the description of PLN's complexity above, one of PLN's strategic programs is the launching of the PLN LEAN Transformation program with procurement digitization as one of the transformation programs to build a strong foundation towards Excellent Procurement. Implementation of e-Procurement Application at PT. PLN (Persero) is expected to have a direct positive impact and introduce New Ways of Working at PLN in realizing Procurement Excellent

PLN is responding to the challenges of the complexity of business processes at PLN by launching the PLN Transformation program. One of the strategic programs in PLN's transformation is the LEAN Program digitizing procurement to build a strong foundation for Procurement Excellence.

The use of information technology in the process of procuring goods and services at PLN is in line with the Industry 4.0 government agenda and the embodiment of e-government which will increase the effectiveness and transparency of business processes at PLN. Besides that, the implementation of e-procurement applications will prevent the possibility of fraud and conflict of interest both vertically (between employees and vendors) and horizontally (within vendors). And in assessing the quality of e-government services to the public, Papadomichelaki and Mentzas, 2012, argue that there are 6 dimensions which are the core of electronic services which include ease of use, trust, the functionality of the interaction environment. and interaction), reliability, content, and appearance of information and citizen support [1].

Then from the side of the PLN Regulation in carrying out the process of Procurement of Goods and Services it still refers to Directors Regulation No. 0022.P/DIR/2020 concerning Guidelines for the Procurement of Goods/Services for PT PLN (Persero) and Directors Regulation No. 0156.P/DIR/2021 concerning Amendments to PT PLN Directors Regulation No. 0022.P/DIR/2020. Apart from the regulations issued by PLN, the procurement process for goods and services at PLN also refers to the provisions and regulations issued by the government. The Board of Directors Regulation No. 0022.P/DIR/2020 states the meaning of the Goods/Services Procurement Process is goods/services procurement activities which include initiation of goods/services procurement (need identification and budgeting), planning of goods/services procurement, the process of implementing goods/services procurement, signing of agreements / Contract, Implementation of the Agreement / Contract, and handover of the results of the implementation of the Agreement / Contract. Then in the Directors' Regulation, it is also explained that the targets for the procurement of goods/services are 6 Rights, namely Right Quality, Right Quantity, Right Location, Right Time, Right Socioeconomic Purpose, and Right Price. In the procurement of goods/services, one must adhere to the principles of procurement namely Efficient, Effective, Competitive, Transparent, Fair and Fair, Open, and Accountable.

The traditional ways of handling the purchasing process are much ineffective and inefficient due to the excessive complications when compared to the use of e-procurement. As a result of e-procurement usage in handling the purchasing process, firms can save enormous resources in the context of cost and time (Zunk et al., 2014) [2]. E-procurement usage enables the organization to access a wider market and streamline purchasing processes (Daoud & Ibrahim, 2017) [3]. According to Presutti (2003), e-procurement is efficient purchasing process management by removing paper-based logs and reports and administering the procurement via internet-based communication systems [4].

The process of procurement of goods/services carried out by PLN units conventionally and not through the e-procurement application, it has several weaknesses, including the procurement of goods/services being very vulnerable to unfair business competition and opportunities for conflicts of interest both horizontally and vertically. unrealistic planning of

procurement schedules, non-transparent procurement processes, management of archives and procurement documents that are not well documented, increase the opportunities for fraud, and many other obstacles.

To overcome various weaknesses that exist in the conventional procurement process of goods and services, PT PLN (Persero) has innovated the implementation of e-procurement applications since 2000 and subsequently, the development of e-procurement application features has been adjusted to the Decree of the Board of Directors No. 0620.K/DIR/2020 and the e-procurement application until the implementation of Board of Directors Regulation 022.P/DIR/2020 have undergone various changes and added features that are tailored to user needs and changes in the organization's business processes as well as adjustments to applicable regulations. The process of socializing the implementation of the e-procurement application has finished to all PLN units to thousands of e-procurement application users from internal PLN and external PLN, namely prospective providers of goods/services and vendors who are belong to the list of selected providers.

The e-procurement application can be accessed in real-time via the internet and intranet networks so that the process of procurement of goods and services becomes more efficient in terms of cost and time savings and is more transparent in its implementation. Increased transparency and accountability of the procurement process can be seen from the reduced number of meetings between prospective providers of goods and services and the procurement executive at the PLN office. Prospective providers of goods and services that have been registered get information regarding the list of procurement announcements, the ongoing procurement process, and the announcement of winners through the official e-procurement website via the https://eproc.pln.co.id link. In addition, e-procurement is also able to encourage the creation of fair business competition in following Law no. 5 of 1999 concerning the Prohibition of Monopolistic Practices and Unfair Business Competition because it can mitigate the risk of fraudulent practices that lead to corruption, collusion, and nepotism.

One of the positive impacts of the implementation of e-procurement in the process of procuring goods and services is an increase in the speed and reliability of public services because the procurement of goods and services becomes more efficient and effective, transparent, and competitive. And one of the outputs that are most expected by PLN next is being able to achieve the procurement target, namely being able to provide the best return for the implementation of PLN's mission or what is known as the concept of value for money. The concept of value for money currently used at PLN no longer uses the cheapest initial price option but refers to the highest return (best return) from a predetermined investment. And this concept is also to accommodate for the optimization of the budget used by PLN in the process of procuring goods and services sourced from the PLN budget and/or loan funds both from within the country and abroad. For this reason, the general guidelines for the procurement of goods and services by PLN must apply good procurement practices and business judgment rules, by making a balance for company management to make the best business decisions for the company with the principle of prudence and not tolerating conflicts of interest for personal or group interests.

The concept of good procurement practice adopted in the guidelines for the procurement of goods and services at PLN is to use a strategic approach such as a supply positioning matrix, focus on value for money, a culture of professionalism and organization as well as risk control with 3 lines of defense and 4 eyes principle.

Agung Suprianto, Soesilo Zauhar, and Bambang Santoso Haryono (2019) conducted research with the title "Analysis of the Effectiveness of the e-Procurement System in

Procurement of Government Goods/Services (Study at the Faculty of Administrative Sciences, University of Brawijaya) [5]. The results of this study indicate that the implementation of the e-procurement system in the process of procuring goods/services at the Faculty of Administrative Sciences, Universitas Brawijaya has been effective as reflected in the achievement of five indicators of the effectiveness of the e-procurement system, namely: indicators of transparency and accountability, indicators of market access and fair business competition. health, efficiency level indicators, monitoring, and auditing indicators, and real-time information access indicators.

E-procurement according to Sutedi (2012: 254) is an auction system in the procurement of government goods/services by utilizing internet-based technology, information, and communication, so that it can take place effectively, efficiently, openly, and accountably [6]. This understanding is almost the same as the explanation from Indrajit quoted by Andrianto (2007: 218) that e-procurement is defined as a process of digitizing tenders or auctions for the procurement of government goods and services with the help of the internet [7].

# Methodology

This study was conducted in the environment of PT. PLN (Persero) from May 2022 to July 2022. The method used in this study uses a quantitative method with a questionnaire approach. Sampling was carried out using a purposive sampling technique (Sugiono, 2019: 133) which included several employees who were at the Central PLN Office and the PLN Unit Office [8]. Informant samples were taken according to the Slovin formula: $n = N / (1 + (N \times e^2))$. The criteria for the sample informants taken in this study were registered e-procurement application users taken from 387 respondents from 15 Regional Main Units at PT. PLN (Persero) and vendors who are DPT (Selected Provider List) who have used the e-procurement application. The search was carried out using a Google form which was sent directly to each predetermined informant.

Slovin's formula allows a researcher to sample the population with the desired degree of accuracy [9]. Before calculating the sample using this formula, it is necessary to determine the confidence level stage. The confidence level is the level of confidence in the results of the truth of the research, or it can also be defined as the level of significance for the tolerance of errors that may occur. This study used a confidence level of 95%, which means that there are 95 chances in 100 that the sample represents the true condition of the population within a specified precision range against 5 chances in 100 that it does not. The criteria for the sample of informants taken in this study comes from internal users and external users who have registered and used the e-Procurement Application. The search is carried out using a google form which is sent directly to each pre-determined respondent.

Primary data is obtained through the results of answers to questions that have been loaded into the google form based on the 6 independent variables ease of use, trust variables, reliability, the functionality of the interaction environment variables, content, and information, and user satisfaction. The secondary data obtained in this study comes from the amount of data on the realization of the planning and implementation procurement process and also trends by procurement value and number through the e-Procurement application. This study will analyze and elaborate on the data obtained and conclude the conclusions results. Descriptive presentation of data obtained through primary and secondary data. The qualitative research approach begins with assumptions and theoretical interpretive frameworks that shape or influence research problems related to the meanings imposed by individuals or groups on a social or human problem [10].

## Result And Discussion

### *The process of implementing e-procurement*

The process of organizing the procurement of goods/services at PLN in terms of the e-procurement system can be described as follows:
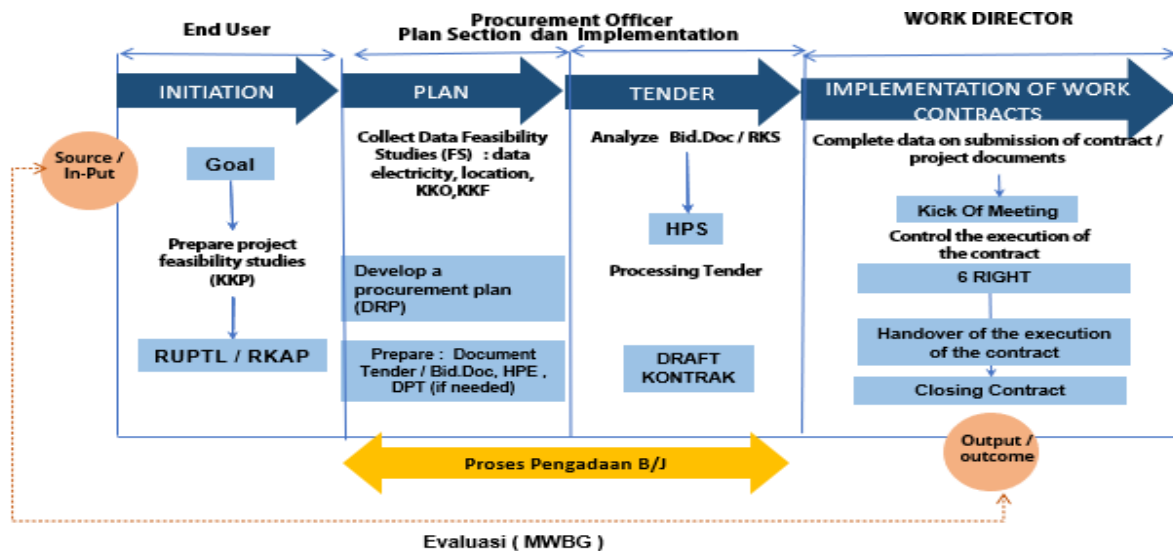


**Figure 1.** *Procurement process*

From Figure 1 above it can be explained that the process of procuring goods and services at PLN starts from an Initiation process made by the user based on the RUPTL/RKAP document which produces an output in the form of a project feasibility study (KKP). Furthermore, the procurement planning section prepares a procurement plan document and tender document along with an engineering estimate price analysis (HPE). Furthermore, the procurement process is carried out by the procurement executive. This section analyzes tender documents to comply with procurement provisions and prepares The Self Estimated Price (HPS). Next, start the procurement process starts with the announcement of tenders, holding explanation meetings, evaluating bid documents, determining and appointing winners, to drafting agreements/contracts.

The next process after the contract is signed by the first party and the second party is the implementation of the contract. Then appointed directors of work in charge of supervising, controlling, and supervising work in the field following the articles in the agreed contract until the process of handing over the results of the work.

From the process of implementing the procurement of goods and services, the e-procurement application is very helpful in creating efficiency, effectiveness, and transparency in the procurement process starting from the planning and implementation stages of procurement. For example, at the announcement stage and tender registration, it can be done via an online e-procurement application. Next is an explanation meeting which is conducted online or in a virtual meeting, then uploads the offer document in the form of encrypted softcopy. Furthermore, the process of opening and evaluating bids as well as making Evaluation Minutes through the features in the e-procurement application. The process of announcement of winners and objections is also carried out online through the e-procurement application. Because most of the processes are carried out through applications to minimize face-to-face meetings with potential providers of goods and services that benefit both parties in terms of time and costs if done offline.

The method of procurement of goods and services through the e-procurement application is carried out through limited tenders, open tenders, direct procurement, and direct appointments. While the method of submitting bidding documents is carried out through one stage of one envelope, one stage of two envelopes, and two stages. Furthermore, the method of price entry is done by bidding, open auction, and closed auction. For the evaluation method, there are two options, namely the knockout system and the value system. Then the types of contracts to choose from are lump sum, unit price, combined lump sum and unit price, turnkey, and unit price agreement (KHS).

The following is a picture of the e-procurement application home screen:

## Unit Office
## Procurement Implementation Division



- Implementation Manual  - Implementation Online
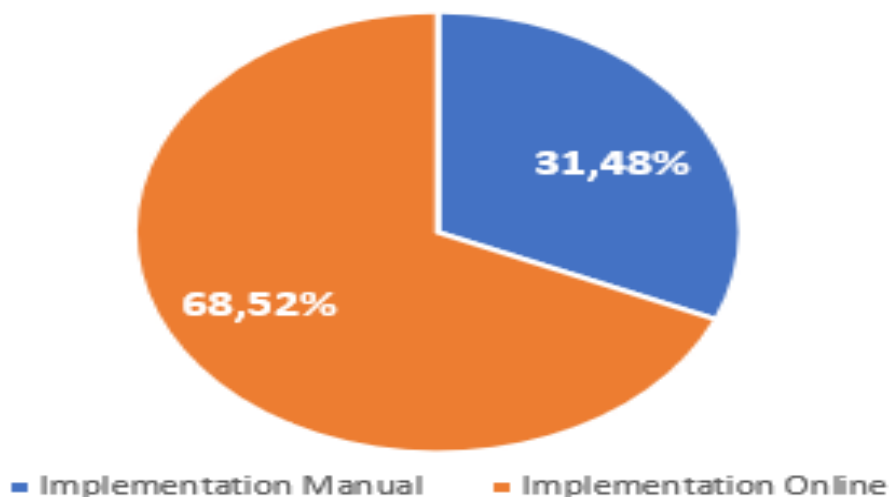
## Unit Office
## Procurement Planning Division



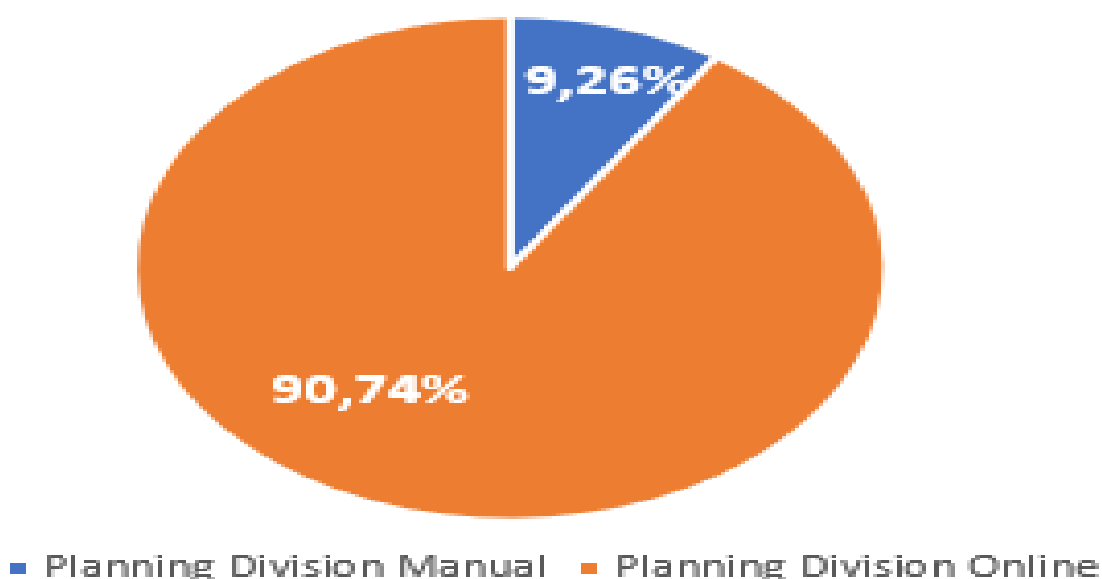- Planning Division Manual  - Planning Division Online

**Figure 2.** *Portal e-Procurement*

PLN develops e-procurement into a digital procurement application that has been rolled out in all PLN units to become an interface between PLN and providers of goods/services, as well as other stakeholders to support the implementation of Good Corporate Governance in the procurement process for goods and services and help to simplify the procurement process. and services at PLN into a standardized system, less paper, efficient, transparent, centralized information, data visibility for decision making, an audit by the system, and eliminating processes that were previously manual and time-consuming, as well as data and information that are still scattered and not yet integrated.

Indicators of the successful roll-out of the e-procurement application in all PLN units can be seen from the realization and utilization of e-procurement applications from year to year has increased both in terms of the number of users and the procurement value which can be seen in the following graphic image:
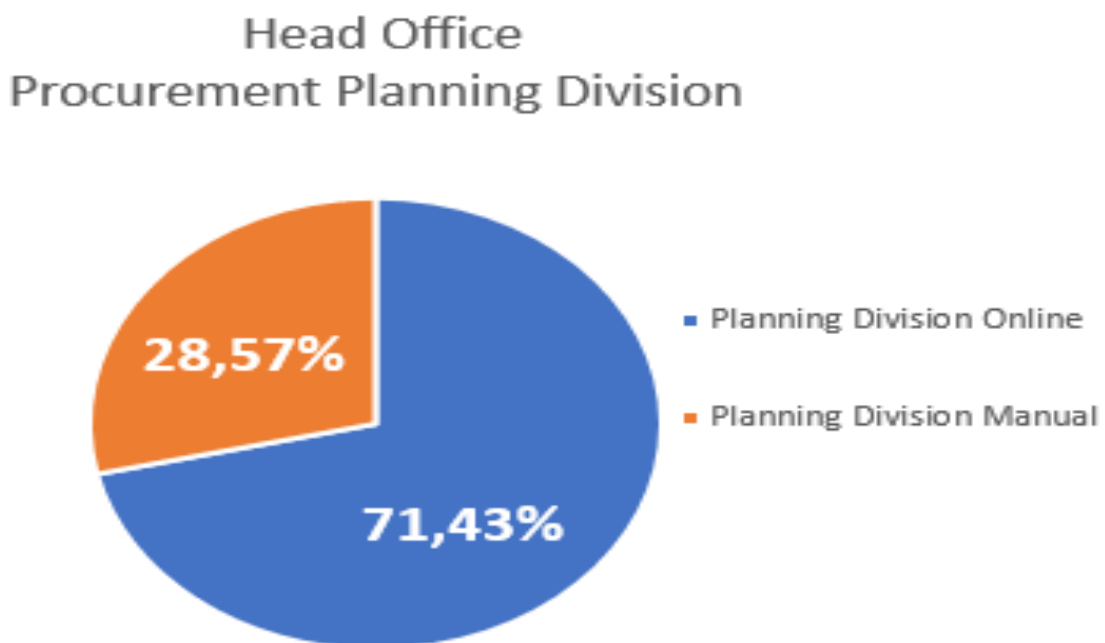


**Figure 3.** *The percentage of e-procurement implementation at the PLN head office*

## Head Office
## Procurement Implementation Division



- Implementation Division Online
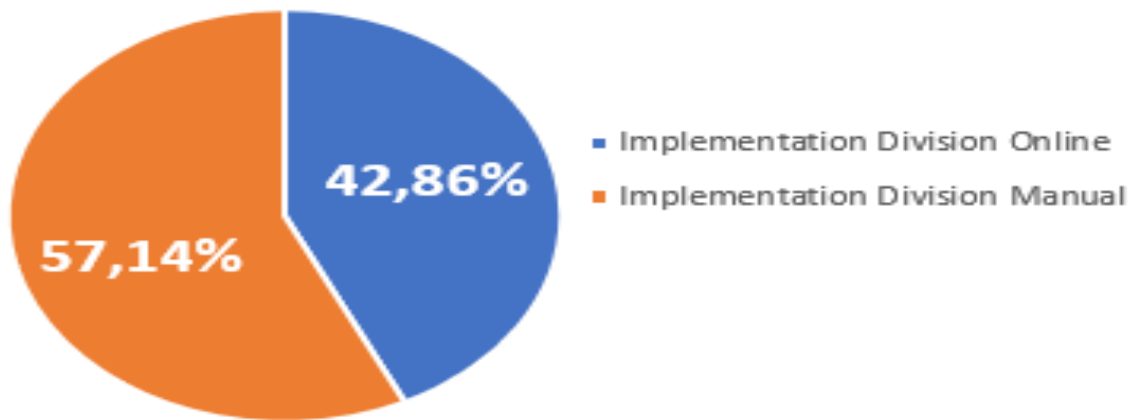- Implementation Division Manual

**Figure 4.** *The percentage of e-procurement implementation at the PLN Unit office*

From the graphic Figure 3 above, the implementation of the process of procuring goods and services at the Central PLN Office which includes the SCM Division, RPS Division, GA Division, and STI Division is carried out manually for the planning section is 28.57% and which is carried out online is 71. 48%. Meanwhile, the part of Executing Procurement that was done manually was 57.14% and 42.86% was done online.

Meanwhile, for procurement data recorded in the e-procurement system at Unit Offices throughout Indonesia, both in layer 1 units and layer 2 units, which are carried out online in the planning section, 90.74% and those carried out manually by 9.26%. As well as in the executive section of procurement carried out online by 68.52% and manually by 31.48%.
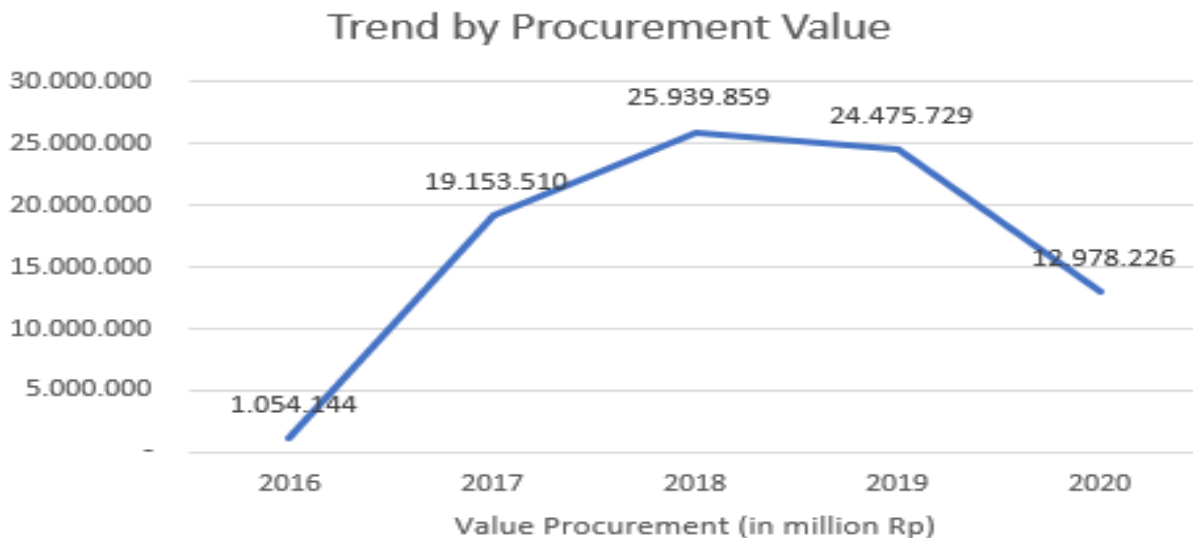


**Figure 5.** *Trend by Procurement Value*

Then for the number of procurements from 2016 to 2020, there is a significant increase in the total value of the procurement, but specifically in 2020 due to the COVID-19 pandemic, there is a decrease in the number of procurements. The highest point was in 2018 with a value of 25,939,859 (in million Rp) which means an increase of 26% compared to 2017 and 96% compared to 2016.
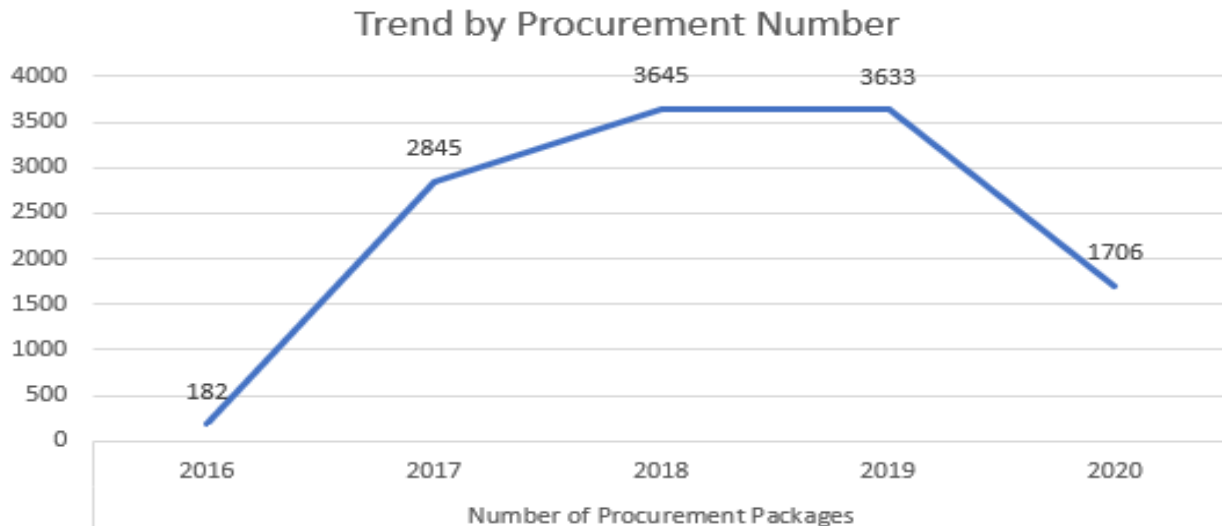
**Figure 6.** *Trend by Number of Procurement Packages*

Then in line with the number of procurement packages, in terms of the value of the procurement packages it has also increased from 2016 to 2019. and has decreased in 2020 also due to the covid 19 pandemic. The highest point is in the range of 2018 and 2019 with the number of procurement packages reaching 3.645 and 3.633 procurement packages
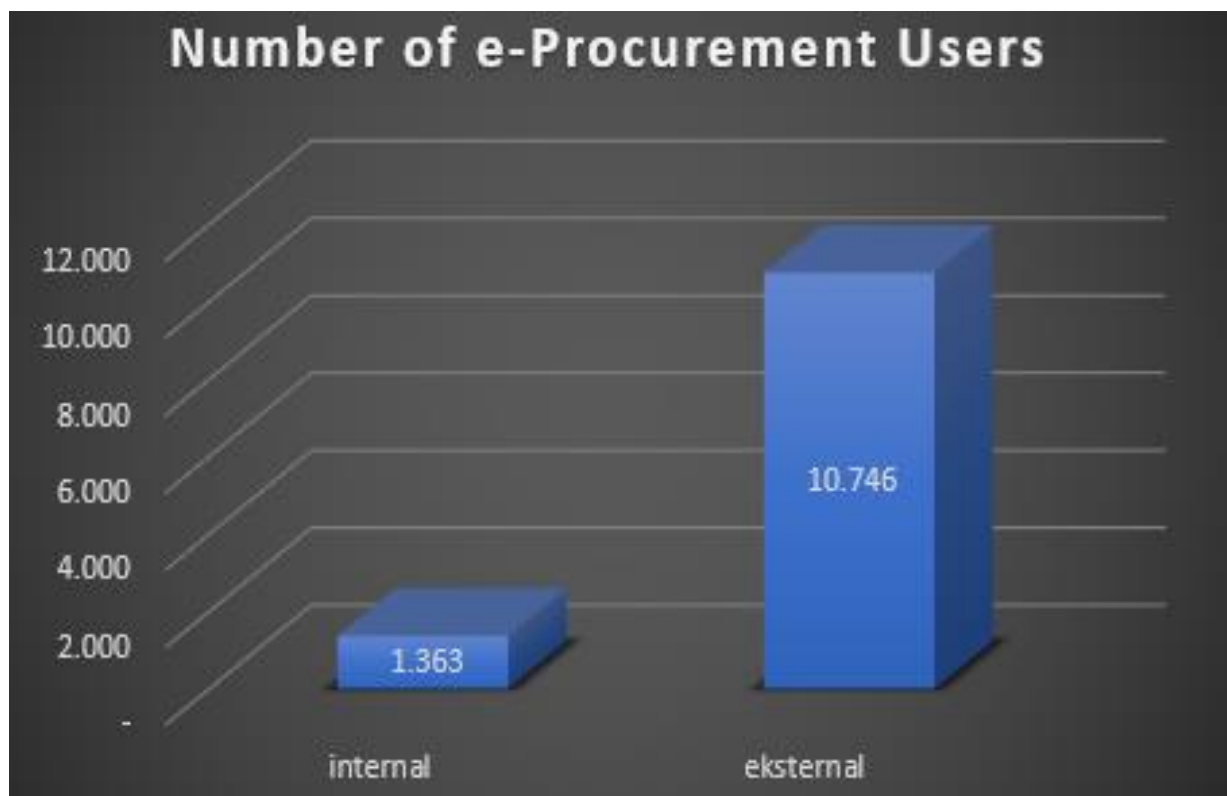


**Figure 7.** *Number of e-Procurement Users*

In terms of the number of e-procurement users, there are currently 1,363 users from internal PLN and 10,746 users from external PLN.

***Validity Test***

The validity test was carried out using the SPSS application on the results of the questionnaire with a total of 387 respondents and the results are shown in Table 1 below:

**Table 1.** *Result of The Validity Test*

| No | Tested question | Number of Respondents | R Calculated | R Table | Result |
|----|-----------------|----------------------|--------------|---------|--------|
| | Ease of Use | | | | |
| 1 | The e-Procurement application is easy to use and the user interface is easy to understand | 387 | 0,407 | 0,098 | Valid |
| 2 | The e-Procurement application facilitates the needs and services for the procurement of goods and services at PLN | 387 | 0,203 | 0,098 | Valid |
| | The Functionality of the Interaction Environment | | | | |
| 3 | The e-Procurement application has complete features and functions well | 387 | 0,115 | 0,098 | Valid |
| 4 | The e-Procurement application has a good protection system for procurement data security | 387 | 0,594 | 0,098 | Valid |
| 5 | The e-Procurement application makes it easy to archive the procurement process | 387 | 0,346 | 0,098 | Valid |
| | Trust & Transparent | | | | |
| 6 | The e-procurement application has a responsive helpdesk system | 387 | 0,116 | 0,098 | Valid |
| 7 | Features of the e-Procurement Application make healthy competition between providers of goods and services more competitive and open | 387 | 0,633 | 0,098 | Valid |
| 8 | The e-Procurement application can prevent fraud opportunities and conflicts of interest in the process of procuring goods and services | 387 | 0,317 | 0,098 | Valid |
| | Reliability | | | | |
| 9 | The e-Procurement application is very reliable used via intranet and internet networks | 387 | 0,403 | 0,098 | Valid |

| No | Tested question | Number of Respondents | R Calculated | R Table | Result |
|----|----------------|----------------------|--------------|---------|--------|
| 10 | The e-Procurement application has fast loading times | 387 | 0,564 | 0,098 | Valid |
| Content and Appearance of Information | | | | | |
| 11 | The e-procurement application displays all required information transparently for all prospective providers of goods and services | 387 | 0,163 | 0,098 | Valid |
| User Support & Satisfaction | | | | | |
| 12 | I am satisfied with the addition of features to the e-Procurement Application | 387 | 0,628 | 0,098 | Valid |
| 13 | I am satisfied with the service through the e-Procurement Application which is very effective | 387 | 0,302 | 0,098 | Valid |
| 14 | I feel that the e-Procurement Application Socialization has been effective and comprehensive for all users | 387 | 0,302 | 0,098 | Valid |

Table 1 shows the Pearson Correlation Value (r count) for each question is greater than the value of the r table. This means that all indicators/question items that measure all variables have a very strong and valid correlation

***Reliability Test***

The realibility test was carried out using the SPSS application on the results of the questionnaire with a total of 387 respondents and the results are shown in Table 2 below:

**Table 2.** *Result of the Reliability Test*

| No | Question yang diuji | Cronbach's alpha | Result |
|----|--------------------|-----------------|--------|
| 1 | Variable Ease of Use1 | 0,643 | Reliable |
| 2 | Variable Ease of Use2 | 0,657 | Reliable |
| 3 | Variable Functionality1 | 0,664 | Reliable |
| 4 | Variable Functionality2 | 0,626 | Reliable |
| 5 | Variable Functionality3 | 0,648 | Reliable |
| 6 | Variable Trust1 | 0,669 | Reliable |
| 7 | Variable Trust2 | 0,618 | Reliable |
| 8 | Variable Trust3 | 0,646 | Reliable |
| 9 | Variable Realibility 1 | 0,640 | Reliable |
| 10 | Variable Realibility 2 | 0,630 | Reliable |
| 11 | Variable Content1 | 0,666 | Reliable |
| 12 | Variable User Support1 | 0,629 | Reliable |
| 13 | Variable User Support2 | 0,638 | Reliable |
| 14 | Variable User Support3 | 0,638 | Reliable |

Based on table 2 above, shows that all statements of the variables Ease of Use, Functionality, Trust, Reliability, Content, and User Support, have a value of Cronbach Alpha ($\alpha$) > r table. So, each question item in this study can be stated to have a consistent reliability value and is feasible to be used in this study [11].

### Ease of Use

Based on the results of a survey of 387 respondents shows that the average value for all the Ease of Use indicators is 3.84 on a Likert scale of 4 as can be seen in Figure 8. It indicates that the ease of use variable is an effective and efficient category because the user interface is easy to understand for both internal PLN users and external PLN users.
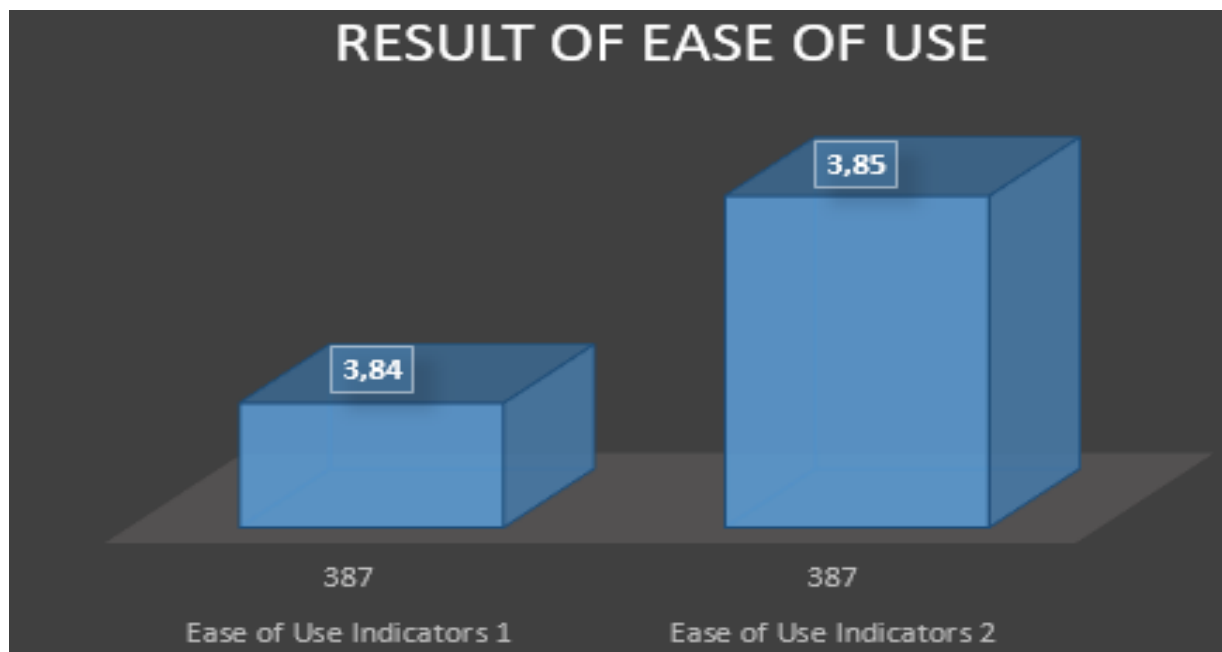


**Figure 8.** *Result of Ease of Use Variables*

### The Functionality of The Interaction Environment

For the Result of Functionality of the Interaction Environment, the average value is 3.86 from a Likert scale of 4 in Figure 9. It indicates that this variable has met what users need and expect from security system aspects and system archive aspects.
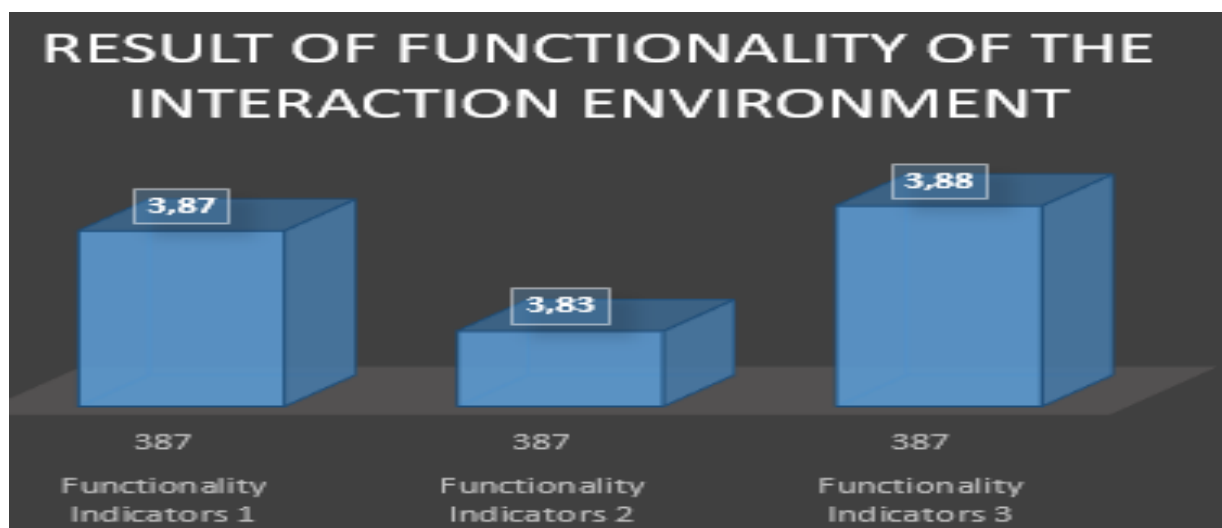


**Figure 9.** *Result of Functionality Variables*

### Trust and Transparent

For the Result of Trust and Transparent, the average value is 3.81 from a Likert scale of 4 in Figure 10. It shows that Trust and Transparent variable has met user and management expectations. Because Features of the e-Procurement Application could make healthy competition between providers of goods and services more competitive and transparent. Furthermore, e-Procurement application can prevent fraud opportunities and conflicts of interest in the process of procuring goods and services.
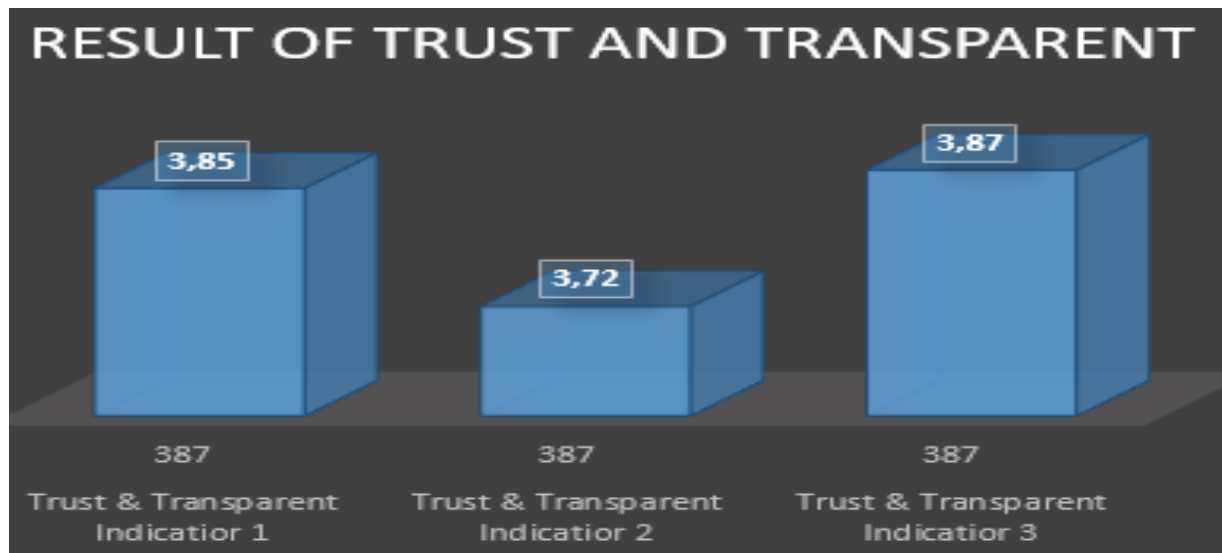


**Figure 10.** *Result of Trust Variables*

### Reliability

For the Result of Reliability, the average value is 3.73 from a Likert scale of 4 in Figure 11. It shows that Reliability variable from e-procurement applications and supporting infrastructure can be relied upon to be used anywhere and anytime and can use intranet and internet networks met user The e-Procurement application is very reliable used via intranet and internet networks.
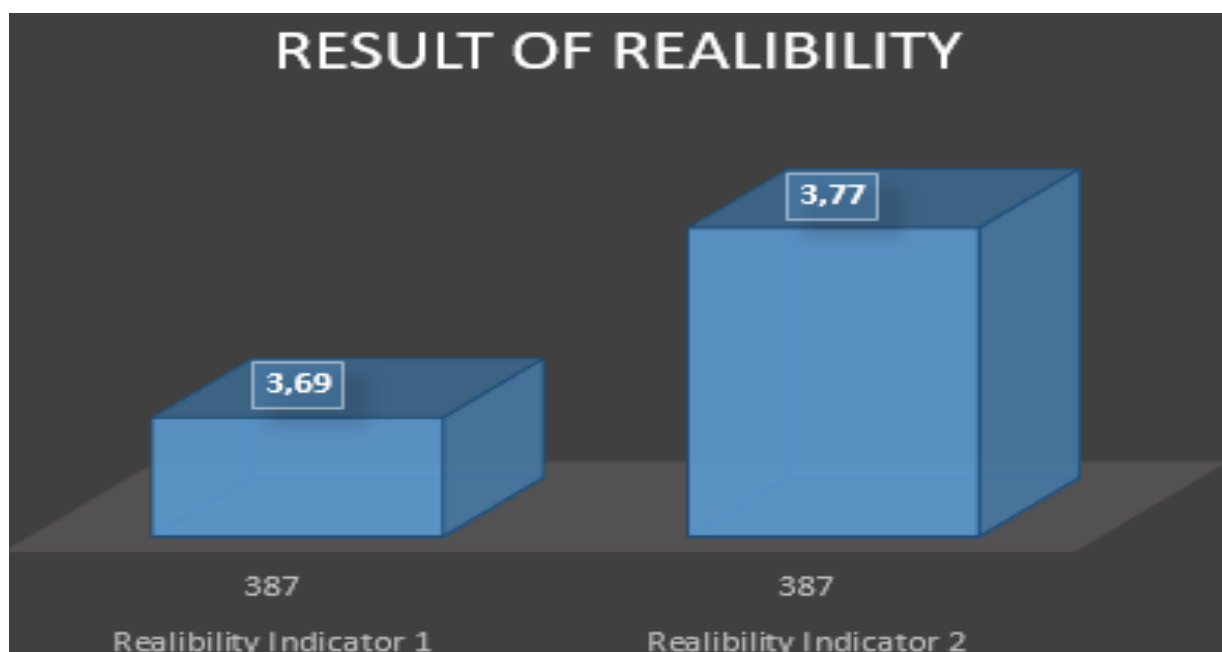


**Figure 11.** *Result of Reliability Variables*

*Content and Appearance Information*

For the content and appearance of the information indicator, the value is 3.86 from a Likert Scale of 4 in Figure 12. It shows that this variable has displayed all required information transparently for all prospective providers of goods and services.
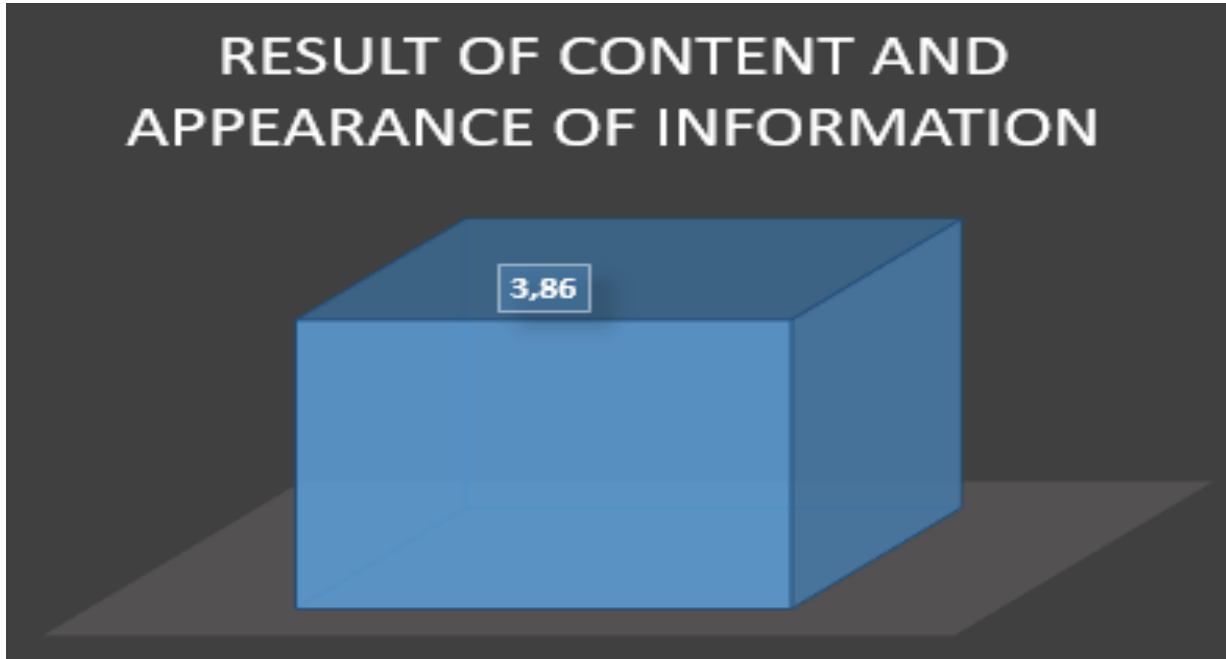


**Figure 12.** *Result of Content Variables*

*User Support and Satisfaction*

For the user support and satisfaction indicator, the average value is 3.84 on a Likert scale of 4. It shows that most users were satisfied with the service through the e-Procurement Application which is very effective with the addition of new features. All users also think the program of e-Procurement socialization has been effective and comprehensive.
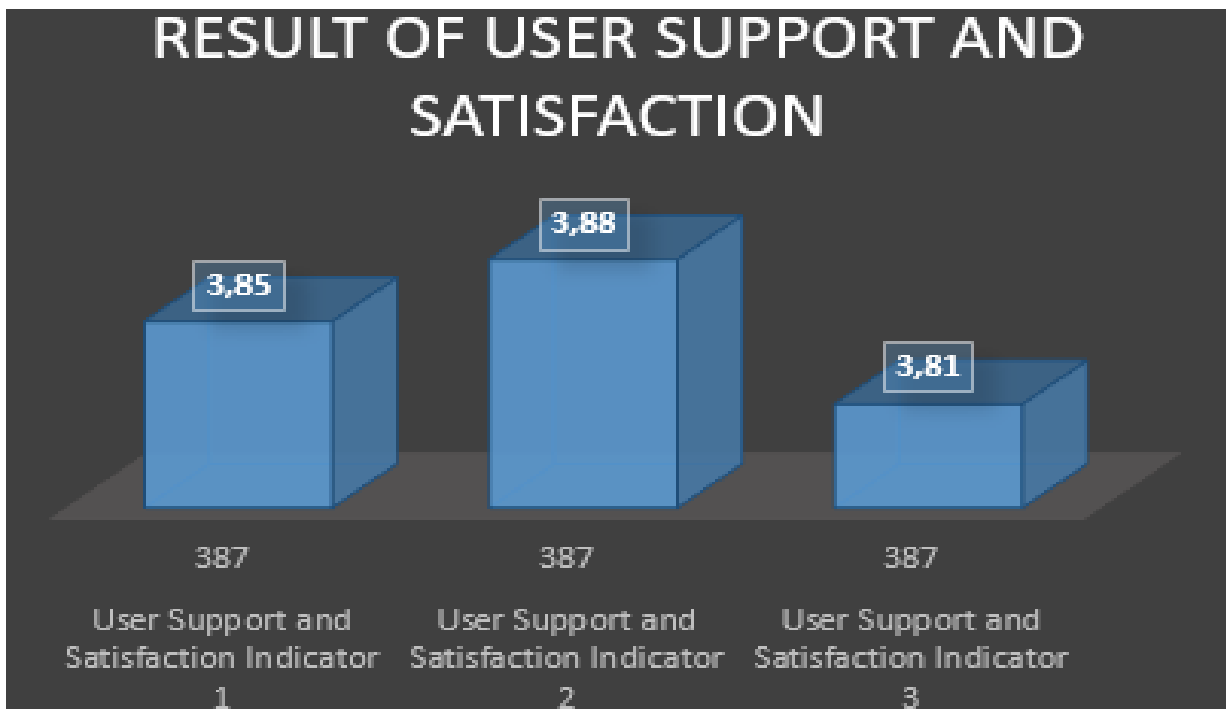


**Figure 13.** *Result of Content Variables*

# Conclusion

***From this study, the following conclusions were obtained:***

a). The survey using a Likert Scale of 4 gives results with the following average values: the level of variable ease of use perceived by users is 3.84, the Functionality indicator is 3.86, Trust and transparent is 3.81, the Reliability indicator is 3.73, Content and Appearance of Information is 3.86, and from user support and satisfaction indicator is 3.84. The result of these survey calculations, validity test, and reliability test indicate that the e-Procurement implementation can meet internal users, external users, and management PLN expectations to realize a transparent, effective, and efficient procurement process following the principle of procurement and Director's Regulation 022.P/DIR/2020.

b). The effectiveness of the e-Procurement Application in improving PLN transparency and efficiency of the company not only in terms of costs but also in terms of time and productivity of employees and the company can be said to have been very effective based on the results of survey questionnaire tests, observations, and other supporting data.

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## Authors Profile

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