

DEVELOPMENT OF ASSET MANAGEMENT INFORMATION SYSTEMS PT. PINDAD (PERSERO)

Richo Ardyani Anwar¹, Tati Harihayati Mardzuki²
^{1,2}Teknik Informatika – Universitas Komputer Indonesia
Jl. Dipatiukur 112-114 Bandung

E-mail : richo.ardyani17@gmail.com¹, tati.harihayati@email.unikom.ac.id²

ABSTRACT

PT Pindad (Persero) is an Indonesian state-owned enterprise specializing in military and commercial products. This company is located in Bandung, West Java. PT Pindad manufactures a variety of superior products including: Weapons, Munitions, Special Vehicles, Castings & Railroad Equipment, Heavy Equipment, Commercial Explosives and Cyber Security. PT Pindad (Persero) currently uses System Application and Product (SAP) in its asset management. Problems that occur from the acceptance of the system are used with the Technology Acceptance Model (TAM) approach, namely the lack of information on assets that have been distributed. While in decision making the repair or removal of assets, the Junior General Manager section experiences difficulties because it only evaluates assets from the condition of the asset. This development is also useful for determining decision making on repairing or eliminating damaged assets using the Simple Additive Weighting (SAW) method and other supporting criteria. After analysis, the tests carried out on the Asset Management Information System developed can be concluded that system development can help the Vice President of Security & Asset Management and the General Junior Manager in monitoring assets that have been distributed and can determine which assets are repaired or eliminated.

Keywords : Asset Management, Asset, Depelovment, Technology Acceptance Model (TAM), Simple Additive Weighting (SAW) Method.

1. PRELIMINARY

PT Pindad is a company engaged in the field of military products in Indonesia specialties like product of weapons, special military vehicles, ammunition, automotive components and rail. The company is expected to generate profits with the continuity of the working process is one of them clinging to his job supporter of human resources and assets. Existing employees at this company that is approximately less than 2500 employees in which all the employees have no assets to support all the needs of the activities in the manufacturing of the company's products. In the scope of work, every asset used in the work should be in good condition

to maintain the quality of work for the convenience of employees, so the company always perform routine checking of assets. The warehouse and the field is the part that is responsible for checking the assets and control of the assets used to ensure that assets are always in good condition. This section consists of Asset Management and Maintenance Managers and Security Managers representing each complaint center of the clerks of the assets used. Work carried out by the warehouse and field checking of assets have working procedures, namely the improvement of assets, elimination of assets and asset security to the barn.

The repair and removal of assets is done every one semester (six months) by the Asset Management and Maintenance Manager and Security Manager filings Center where repair and removal has been approved by the General Manager Junior. Fixed assets are assets that support the company's operational activities are permanent. Each division has approximately 1100 assets and the assets are classified into five types of assets as land, buildings, equipment and utilities, transportation, and office machine tool.

PT Pindad (Persero) in managing assets using System Application Products (SAP) is the module Fixed Assets in which there are sub-modules, namely modules assets that serve for the management of the whole of fixed assets in the company, including the use of assets, depreciation of property and removal asset. Based on the results of questionnaires to the Technology Acceptance Mode measurement (TAM) in Appendix C-1 TAM measurement results expressed proof measure to reject or accept the hypothesis that less than 0.05 is on the quality of information on the perceived ease of use, the quality of information on the system positively affects perceived ease of use, especially in the quality of information on the monitoring system.

Meanwhile, from the interview with Mr. Dudi Setiadi as Junior General Manager in addition to the management of asset management at companies already using the System Application Products (SAP), but there is a module repair and removal of assets that are still manual, so that in 2017 there was an error in performing the elimination of assets, Junior General Manager as decision-making and approval of property, plant made a mistake abolition of the division of HC & BANG ORG and division

accounting where assets that should be abolished, but be fixed as Junior General Manager conduct the removal of assets by assessing the assets of the condition of the asset does not by criteria other. Moreover Junior General Manager should take a long time to determine which assets will be repaired or scrapped.

2. BASIC THEORY

2.1 Information System

The information system is a system that meets the needs of refineries managerial transactions of a particular organization with the necessary reports [1].

References [1] explains that tObjective principal of Information Systems is to collect, store, manage data and provide output information to users, and send the information to support decision-making in an organization [1].

2.1.1 Asset Management Information System

The management information system is a collection of things that work together to form a union and work together to achieve goals.

Reference [2] explains that the purpose of a management information system that is for the purposes of the implementation of management functions in determining the right decision [2].

Character 2.1.2 Information Management System

Character information management system is an organization obtained a special section that functions as a manager, as well as the data processing as well as information of each part in a group that is concentrated in the area of information management systems [3].

2.2 Assets

An asset is a supporting operations of the company that has the form, as well as the economic value of more than one year to conduct work in the company. Assets can also be classified include: land and buildings, machinery, tools and office equipment there also does not look like copyright [4].

2.3 Technology Acceptance Model

Technology Acceptance Model namely acceptance by users of the system and define the behavior of the use of the system. This usage acceptance defines each user's behavior with two variable utilization perception and perceived ease of use as well as with variable - other supporting external variables.

TAM in more detail interpreted as acceptance by the system with certain variables that can affect the easy acceptance of the system by the user. Technology acceptance serves not only prediction models, but also to define, so that researchers can

identify why a particular system that may be unacceptable, and must go through the steps overall improvement. Technology acceptance model of a model that is built functions to analyze the factors that affect the receipt of the use of the system [5].

2.3.1 Measurement Scale

Measurement scale that is a way to quantify and qualify the data from a variable [6]. The measurements used are the Likert scale, measurement using the item directly result would have been good and bad are directly bound. Likert scale is used to measure the opinion of each group's perception of a phenomenon and wears a size ordinal.

2.3.2 Test Validity and Test Reliability

Validity function to measure the validity of the questionnaire. obtained two formulas or for testing the validity, including bivariate correlations Pearson and Correlated Item Total Correlation where all it is a formula that can be used for testing the validity of using the SPSS application. The formula is as follows:

$$r_{hitung} = \frac{n \cdot (\sum XY) - (\sum X) \cdot (\sum Y)}{\sqrt{[n \cdot \sum X^2 - (\sum X)^2] \cdot [n \cdot \sum Y^2 - (\sum Y)^2]}}$$

Information :

n: number of respondents

X: Score respondents' answers variable

Y: The total score of the variables for the respondent to-n

While the reliability test that is used for the measurement of a questionnaire which is an indicator of variables. Questionnaires reliable if the answer to the consistent statements. In a reliable test can be said to be reliable when the results of the tests reliably show the value of Cronbach Alpha > 0.60 [7].

2.4 Database Management System

Database Management System (DBMS) is a collection of useful application programs for managing data bases. Database Management System in which there is a set of data and programs to access data. The database is the software that determines how data is stored, organized, and modified. DBMS mechanism that is by the use of shared data and data security [8].

2.4.1 MySQL

MySQL is a software SQL database system is multithreaded, multi-user. Where everyone is free to wear it, but it should not be used for commercial purposes [9].

2.5 Simple Additive weighting

Simple Additive weighting is a method of decision-making by means of a ranking. This method takes decisions by ranking weighted

summation of rating performance on each alternative on all criteria [10]. To generate this ranking decision-making with the normalization process took a decision matrix to a scale that can be compared to all alternative rating. The completion steps, namely:

1. Define the criteria for taking decisions.
2. Providing value compatibility rating for each alternative on each criterion.
3. Determine the weight of preference or importance level (W), each criterion
4. Create a table rating matches each alternative in every criterion.
5. Make a decision matrix formed from a rating table suitability of each alternative on each criterion. The value of each alternative on each criteria have been determined, wherein, $i = 1, 2, \dots, m$ and $j = 1, 2, \dots, n$.
6. Doing normalizing the decision matrix by calculating the value of ternormal performance rating (r_{ij}) of the alternatives on criteria.

$$r_{ij} = \frac{x_{ij}}{\max(x_{ij})} \quad (2.1)$$

$$\frac{\min(x_{ij})}{x_{ij}}$$

7. The results of the rating value (r_{ij}) form a matrix ternormal (R).
8. The final result of the preference value (V_i) obtained from the sum of the elements from ternormal matrix multiplication element row (R) with a weight preferences will (W) corresponding column of the matrix element (W).

$$V_i = \sum_{j=1}^n w_j r_{ij} \quad (2.2)$$

3. CONTENTS OF RESEARCH

3.1 Analysis of the Old System New System

Analysis of the old system with a new system describes the comparison of the old system to the new system. Analysis of the comparison can be seen in Table 1.

Table 1. Old and New Systems Analysis

No.	Old system	New system
1	The monitoring system displays the number of total assets	The monitoring system illustrated through charts and detailed for each deployment of assets in each division
2	Deletion repair system simply by evaluating the assets of state assets	System repair and removal of assets using criteria - criteria for support and produce a ranking of each asset.
3	Exodus repair or removal of displays of assets and asset condition.	Exodus repair or removal of assets damaged displays and supporting criteria

3.2 System Requirements Analysis

Identify the needs of the system on the SAP system Asset Management in PT PINDAD include monitoring activities, improvement of assets, elimination of assets. Analysis of system requirements can be seen in Table 2.

Table 2. System Requirements Analysis

No.	Part	System Requirements
1	Vice President Security & Asset Management	For monitoring presence disudat assets deployed in each division.
2	Junior General Manager	To know and make decisions repair or removal of assets.
3	Asset Management & Maintenance Manager	To find the submission repair or removal of the assets of each wearer assets.

3.3 Analysis of Asset Management Information System Development

Analysis of the application of asset management information system development at PT PINDAD (Persero using models POAC (planning, organizing, actuating, controlling). Here is a model of the development of asset management information system which will be applied to PT PINDAD (Persero) in Figure 1:

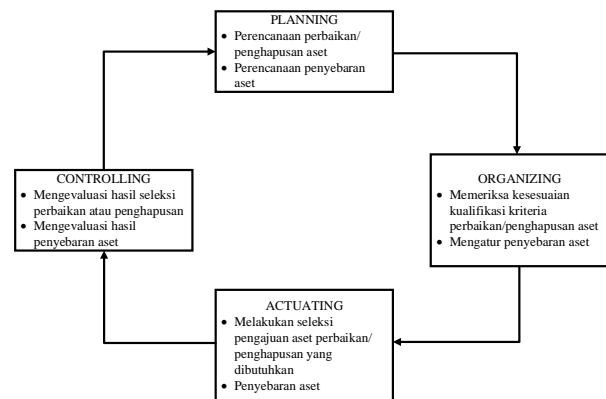


Figure 1. Model Development POAC SIM

3.4 Analysis of Repair or Removal of Assets

Repair / removal is done to meet the needs of the employees to the optimal asset performance. The stages are carried out in the process of repair / removal of assets at PT PINDAD conducted by the Asset Management and Maintenance Manager and General Manager Junior is as follows:

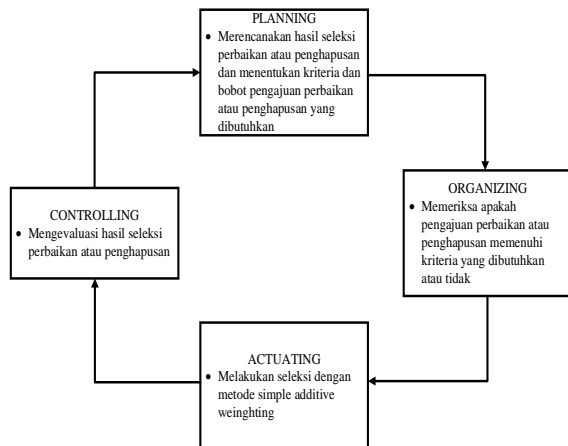


Figure 2. Stage POAC SIM Repair or Removal of Assets

Explanations to Figure 2 in the stages of repair / removal of assets at PT PINDAD (Persero) is as follows:

a. Planning

At this stage PINDAD PT (Persero) to plan improvements and removal of assets of any one semester (six months), the manager of asset management and maintenance of collecting all the reports submitted from each division were then handed over to the security manager of the center to be assessed. Here is a list of assets that the submission has been accepted by the management and maintenance of the asset manager in Table 3:

Table 3. Filing Data Repair

NO	CODE OF ASSETS	TYPES OF ASSETS	NAME ASSETS	DIVISION
1	5003090	Equipment & Utility	Ventilating Fan FV-25RUN5 Brands. Panasonic	Division HC & BANG ORG
2	5003091	Equipment & Utility	Ventilating Fan FV-25RUN5 Brands. Panasonic	Division HC & BANG ORG
3	5003092	Equipment & Utility	Ventilating Fan FV-25RUN5 Brands. Panasonic	Security & Asset Management Division
4	5003093	Equipment & Utility	Ventilating Fan FV-25RUN5 Brands. Panasonic	Division HC & BANG ORG
5	5003094	Equipment & Utility	Ventilating Fan FV-25RUN5 Brands. Panasonic	Security & Asset Management Division
6	7011714	Office tools	LED Monitor Uk.18.5 "Brands Samsung	Division HC & BANG ORG
7	7011715	Office tools	Inkjet Printer Type L-210 Brand Epson	Division HC & BANG ORG
8	7011716	Office tools	16 Megapixel Digital Camera Brand Nikon	Division HC & BANG ORG
9	7011717	Office tools	FILLING CABINET TYPE FC-4	Division HC & BANG ORG

10	7011724	Office tools	GUEST TABLE TYPE LENGTH OSD	Division HC & BANG ORG
11	7011730	Office tools	FILE CABINET TYPE ST-3	Security & Asset Management Division
12	5003095	Equipment & Utility	AC 1PK Brand Panasonic Inverter ENVIO	Security & Asset Management Division

b. Organizing

Organizing is a step in ensuring the needs of repair or removal of any filing of repair or removal to carry out plans and achieve goals.

c. actuating

the data listed in Table 3 were assessed every submission repair or removal using Simple Additive weighting method (SAW). The results of the calculation method of SAW is in Table 4:

Table 4. SAW Method Calculation Results

name Assets	Ranking	Status
FILE CABINET TYPE ST-3	0.65	repaired
CHAIR CH-33-F	0.73	repaired
CHAIR CH-33-F	0.88	abolished
Split AC 2 PK S18NL Merk.LG	0.58	repaired
GUEST TABLE TYPE LENGTH OSD	0.78	repaired
Split AC 2 PK S18NL Merk.LG	0.65	repaired
Split AC 2 PK S18NL Merk.LG	0.65	repaired
AC Split 1 PK Brand LG	0.63	repaired
Ventilating Fan FV-25RUN5 Brands. Panasonic	0.70	repaired
Ventilating Fan FV-25RUN5 Brands. Panasonic	0.90	abolished
Ventilating Fan FV-25RUN5 Brands. Panasonic	0.73	repaired
Ventilating Fan FV-25RUN5 Brands. Panasonic	0.73	repaired
Ventilating Fan FV-25RUN5 Brands. Panasonic	0.53	repaired
LED Monitor Uk.18.5 "Brands Samsung	1.00	abolished
Inkjet Printer Type L-210 Brand Epson	0.83	abolished
16 Megapixel Digital Camera Brand Nikon	0.63	repaired
FILLING CABINET TYPE FC-4	0.88	abolished
GUEST TABLE TYPE LENGTH OSD	0.73	repaired
FILE CABINET TYPE ST-3	0.73	repaired
AC 1PK Brand Panasonic Inverter ENVIO	0.65	repaired

d. controlling

The results in Table 4 are meeting the needs repair or removal of the assets of PT PINDAD. The assets will be secured by the Security Manager for the Center transferred into the warehouse.

3.5 Analysis Database

In the development of management information systems required in a design asset database, where the database is linked to the API provided by the company. modeling will be used in database design using Entity Relational Diagram. Modeling can be seen in Figure 3.

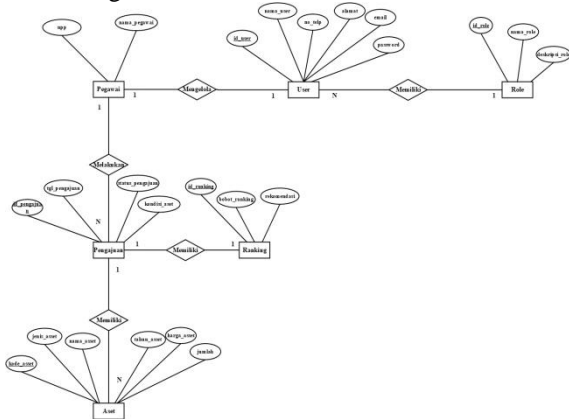


Figure 3. ERD Asset Management Information System Development PT PINDAD

3.6 Diagram Context

Context diagram is a diagram illustrating the relationship between external entities, input and output of the system. Diagram context of the development of asset management information system PT PINDAD can be seen in Figure 4.

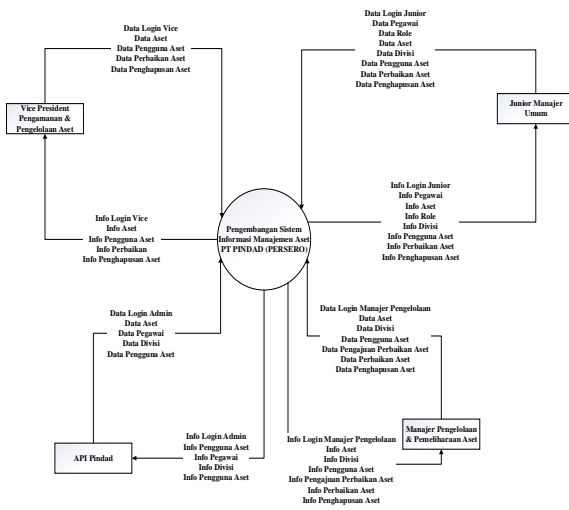


Figure 4. Context Diagram Asset Management Information System Development PT PINDAD

3.7 DFD Level 0

Data Flow Diagram Level 0 Asset Management Information System Development PT PINDAD can be seen in Figure 5.

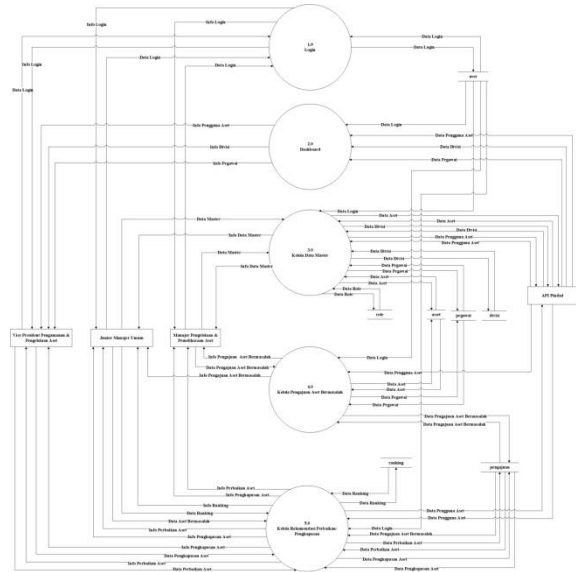


Figure 5. DFD Level 0 Asset Management Information System Development PT PINDAD

3.8 Relation Scheme

Scheme relations, namely a series of relationships between multiple tables in a database system. Circuit description of the database in the development of this system can be seen in Figure 6.

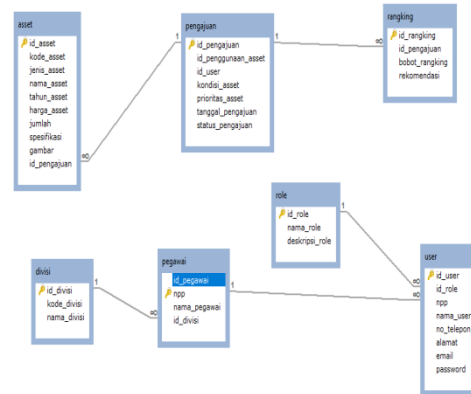


Figure 6. Relation Scheme Asset Management Information System Development PT PINDAD.

3.9 Interface

Interface design log on asset management information system PT PINDAD can be seen in Figure 7.

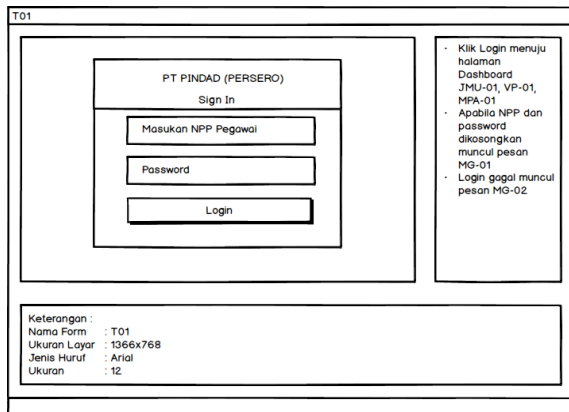


Figure 7. Design Interface Login Asset Management Information System PT PINDAD.

3.9.1 Interface Home Vice President Security & Asset Management

Interface design homepage vice president of security and asset management in asset management information system PT PINDAD can be seen in Figure 8.

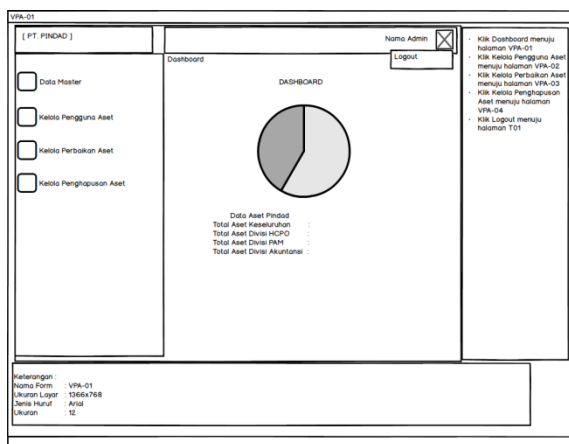


Figure 8. Interface Design Home Vice President Security & Asset Management In Asset Management Information System PT PINDAD.

3.9.2 Interface Home Junior General Manager

Interface design homepage junior general manager of asset management information system PT PINDAD can be seen in Figure 9.

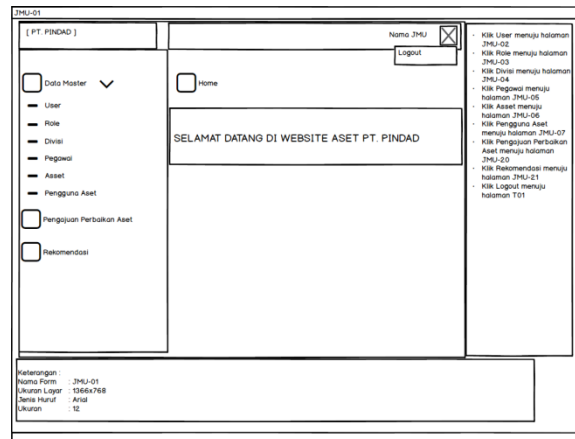


Figure 9. Interface Design Home Junior General Manager Asset Management Information System On PT PINDAD.

3.9.3 Interface Home Manager Asset Management & Maintenance

Interface design homepage manager asset management and maintenance management information system assets of PT PINDAD can be seen in Figure 10.

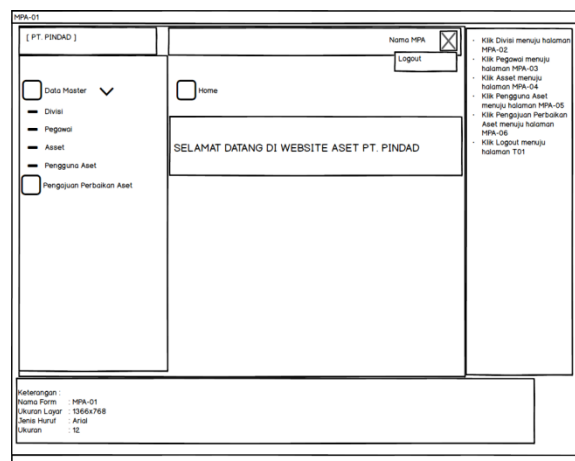


Figure 10. Interface Design Home Manager Asset Management & Maintenance Management Information System On Asset PT PINDAD.

4. TESTING

4.1 Testing System

Testing of the system is the most important thing that the aim of finding errors and deficiencies in the development of information systems being tested. Testing the system intends to determine system performance information that has been made in accordance with the design objectives. Testing the system uses black box testing. Black box testing focuses on functional requirements of the software, User Acceptance Test (UAT) and end-user acceptance.

4.1.1 Scenario and conclusion Blackbox Testing

Black box testing scenarios for the development of asset management information system in PT. PINDAD (Persero) can be seen in Table 5.

Table 5. Black Box Testing Scenarios

class Test	Test Item	types of Tests
<i>Login</i>	<i>Login user</i>	<i>Black Box</i>
Processing User Data	Adding user data management assets	<i>Black Box</i>
	Changing user data management asset	
	Looking for asset management user data	
Role Data Processing	Data Adding role	<i>Black Box</i>
	Changing the role of data	
	Role of data data search	
Data Processing Division	Adding the data division	<i>Black Box</i>
	Changing the data division	
	Data data search division	
Employee Data Processing	Add employee data	<i>Black Box</i>
	Edit employee data	
	Looking for employee data	
Data Processing Assets	Adding to the asset data	<i>Black Box</i>
	Changing the asset data	
	Deleting data assets	
	Looking for asset data	
User Data Processing Assets	Adding user data assets	<i>Black Box</i>
	Changing user data assets	

Based on the results of functional tests have been done on the development of asset management information system in PT. PINDAD (Persero), it can be concluded that the functional system is in conformity with the initial design and have met the system requirements as expected.

4.1.2 Conclusion UAT Testing

Based on the test results the user acceptance test has been done on the development of asset management information system in PT. PINDAD (Persero), it can be concluded that the procedures carried out are in accordance with the process of being tested and is expected by potential users.

Conclusion 4.1.3 User Acceptance

Based on test results, it was concluded that the system of asset management information regarding the testing of this system that the system helps and eases junior general manager to determine on which assets need to be corrected or eliminated in order to maintain the quality of the assets used by the employee.

5. COVER

5.1 Conclusion

Based on test results obtained from studies conducted in the preparation of this thesis as well as referring to the purpose of the study that has been created, it can be concluded that:

1. Asset Management Information System Helps Vice President of Security and Asset Management for asset monitoring over the asset that has been distributed to all divisions.

2. Asset Management Information System Helps Junior General Manager for decisions determine asset repair or remove assets.

5.2 Suggestions

Based on the results achieved in developing the Asset Management Information System PT PINDAD it still has shortcomings, therefore it is advisable to add things that can complement the future, including:

1. The addition of displacement navigation facilities use more assets in more detail.
2. An increase in the more detailed analysis of the development of the Asset Management Information System in PT. Pindad (Persero).

BIBLIOGRAPHY

- [1] J. Hutahaean, Concept Information Systems, Yogyakarta: DEEPUBLISH, 2014.
- [2] GB Davis, Framework for the Management of Information Systems, Central Jakarta: PT. Pledge Mandiri Abadi, 1999.
- [3] E. Indrayani and Humdiana, Management Information Systems, Yogyakarta: Graha Science 2006.
- [4] Azhar Susanto. 2000. Management Information System concept and its development. Lingga Jaya. Bandung.
- [5] Davis, FD 1989. "Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology." Management Information Systems Quarterly. September 1989
- [6] Sugiyono. 2009. Quantitative Research Methods, Qualitative and R% D. Bandung: Alfabeta.
- [7] Ghozali, Imam. 2006. Applications Multivariate Analysis with SPSS Program. Semarang: Diponegoro University Publishers Agency.
- [8] Jacob, 2012, Introduction to Information Systems, Graha Science, Yogyakarta.
- [9] US-M.Shalahuddin Rosa 2011, Software Engineering (Structured and Object Oriented, MODULA, Bandung
- [10] Churchill, Gilbert A. "Basics of Research Marketing "Edisi4, Jilid1, Interpreting By Andriani, et al. Jakarta. Erland. 2005