

Product Development Strategy PT. Pindad in Improving the Indonesian Defence Industry

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Abstract - PT. Pindad is an Indonesian Manufacturing Industry Company which is engaged in Military Products and Commercial Products. Activities of PT. Pindad covers Design and Development, Engineering, Assembling, and Fabrication and Maintenance. This company is the only BUMN (State Owned Enterprise) company in Indonesia that is engaged in the military. The purpose of this research is the product development of PT. Pindad for the development of the Indonesian defence industry uses the Analytical Hierarchy Process (AHP) method with a sectorial approach. The sectorial approach is focused on the activity sectors in PT. Pindad. Based on research results from data related to the Indonesian defence industry, there are 4 superior products of the defence industry, including rifles, munitions, personnel transportation vehicles / armoured vehicles and medium tanks. By knowing some of the leading sectors, it can be expected to be the basis for the formulation of the defence industry to be free from dependence on supply of weapons systems from other countries and also free to determine foreign policy without being influenced by foreign pressure. Therefore, the Indonesian defence industry must be maintained and developed to increase Indonesia's status in the eyes of the world and strengthen our foreign diplomacy, especially defence diplomacy.

Keywords: Defence Industry, Diplomacy, Independence.

I. INTRODUCTION

In the current era, there has been an increasing trend in the intensity of cooperation between countries in the world in building their defence industry. Even today, developed countries prefer to build their industry through cooperation with other countries rather than doing it independently because of the significant cost reduction [1]. This is inseparable from the various policy trends of tightening the budget, increasing research and development costs, and increasing the intensity of competition in the defence industry market [2]. The globalization of the defence industry, which has led to a change in the dynamics of weapons procurement from independent procurement to interdependence, is referred to as one of the phenomena of intensive cooperation and collaboration in the production of weapons.

One of the basic elements in a country's defence efforts is military strength, the government continues to improve the quality and quantity of defence to prevent anything that disturbs the stability of the country [3]. The role of the main weapon system tool is considered very important or vital because apart from being a means of state defence, defence equipment is also an important part in maintaining the security of a country from unwanted threats. The role of the main weapon system tool is all forms of tools and components that function as a means of defence of a country that is used by the military, in carrying out security processes and preventing military conflicts and conflicts that endanger state sovereignty and is useful in developing a country's military professionalism, because one of the characteristics of the army that Modern soldiers are soldiers who can understand various kinds of weapons whose technology continues to develop over time[4]. The establishment of an independent weapons industry is also one of the steps that every country, including Indonesia, is pursuing as an effort to maintain state sovereignty [5]. Because if the defence equipment owned is damaged, lacking, or weak, there will be risks such as invasions by other countries or seizure of territory that can threaten national defence and security.

PT Pindad (Persero), hereinafter referred to as Pindad, is a company or State-Owned Enterprise (BUMN) which is engaged in the field of state defence and security. Pindad provides the needs of the main weapon system equipment products to support the independence of the defence and security of the Republic of Indonesia [6]. Regarding the results of defence and security products, in carrying out marketing activities Pindad also immediately focuses on certain targets, in this case military agencies, and other similar institutions at home and

abroad[7]. Apart from the marketing aspect, Pindad is also interesting to see from the company's publicity perspective. As a government-owned company, the impression of rigidity in packaging messages must be embedded in the minds of the people. Although the products produced are special products and the target market is also specific, Pindad still pays attention to the company's image in the eyes of the general public [8]. In an effort to carry out new innovations and product development, Pindad takes several ways to establish cooperation with outside parties [9]. Steps such as signing cooperation contracts with companies and other countries are carried out by Pindad to increase relations, besides that it is also used to increase cooperation in the development of defence equipment to support the realization of the independence of the Indonesian defence industry and increase exports of Pindad products[10]. Steps such as signing the memorandum of understanding are Pindad's way of establishing cooperation between companies, but apart from that, the Indonesian government also carries out several forms of activities such as conferences or other activities that discuss national defence to approach other countries in order to create cooperation to develop technology. Indonesian defence equipment

Building a strong national defence system of a country, must have consideration of the following four things: country geographical factors, national resources of a country, analysis of possible threats that will arise and technological development [11]. Defence products have always been state of the art, the development of defence technology is always considered to represent the defence power of a country because it is followed by deterrence capabilities to respond to threats that are always changing and developing rapidly [12]. A country that has an established defence industry is considered to have a strategic advantage in the global order. The domestic defence industry is one of the state's efforts to improve and develop the national defence system independently to be able to meet the needs of defence equipment both in quantity and quality in accordance with geographical characteristics and technical specifications as needed by users, in this case the Indonesian National Army.

These problems are related to one another in supporting the need for the main weapon system equipment in their country or are moving to become an exporter of weapons and war equipment. To build a large industry, a priority scale must be drawn up for the industrial development targets that will be used as superior products and then strengthened through appropriate government policies. There needs to be support from the military, in this case the Indonesian National Army as the end user, to build the core competencies of the national defence industry by accepting all its shortcomings. The national defence industry that is not yet strong tends to produce less prime products with relatively expensive costs when compared to imported products [13]. However, if the products of the national defence industry are not supported by the central government and the military, the national defence industry will not be able to produce competitive products and the Indonesian military will always depend on imported products [14]. Defence products that are not superior products will be forced to be imported from foreign industries. The selection of domestically produced defence products is not always high-tech. However, what is decisive is the product that has components from the results of the core competence of national production [15].

To deal with these problems, the Indonesian defence industry needs to innovate both in the fields of technology, capabilities, weapons and production models. One of the Indonesian government's efforts to improve the capability of the domestic defence industry is to purchase the main weapon system equipment for the Indonesian National Army which has advanced capabilities and technology from well-known companies with a cooperation process and Transfer of Technology (ToT) agreement. In the ToT program, the Indonesian defence industry can absorb existing knowledge, technology and experience so that it can develop the capabilities of the domestic defence industry.

II. METHOD

A. *Research methods*

This research is located at PT. Pindad by focusing on the discussion on leading sectors and looking at the level of progress of a specific market and product as the defence industry. The method used in this research is descriptive quantitative. The data used is the product of PT. Pindad For data that was analysed using AHP, an interview process was carried out. Due to the limitations of the researchers, the objects interviewed were the Director of Industrial Products Business and the Director of Technology and Development of PT. Pindad.

B. *Data or information collection techniques*

The data collection techniques in this paper are in the form of primary and secondary data, while the research informants in writing this paper are the Director of Industrial Products Business and the Director of Technology and Development of PT. Pindad. Due to the limitations of the researcher, the source of data

collected for the assessment of the industrial sector in the AHP method was only taken from one informant. The data or information needed to answer the problems in the research will be collected through two data collection methods, namely by interview or interview. The interview technique used in this research is in-depth interviews. This interview technique is carried out directly with informants regarding all questions that will be asked as data weighting in the AHP analysis. Data collection from interviews with the Director of the Industrial Products Business and the Director of Technology and Development was done manually through question weights to obtain more accurate information and data in determining decisions and policies on the development of these leading sectors.

C. Analytical Hierarchy Process Method (AHP)

AHP analysis is a data analysis technique by making a decision by combining personal considerations and values logically, can develop a new scale to measure the properties that have occurred [16]. AHP breaks down complex multifactor or multi-criteria problems into a hierarchy. Hierarchy is defined as a representation of a complex problem in a multi-level structure, where the first level is the goal, followed by the level of factors, criteria, sub-criteria and so on down to the last level of alternatives with a hierarchy of complex problems can be described in groups that then arranged into a hierarchy as the problems will appear more structured systematically [17]. One of the main advantages of AHP that distinguishes it from other decision-making models is that there is no absolute consistency requirement [18]. This method will help the author to determine the weight of each indicator from the interview results which will then be processed using the AHP method. In the writing method, the author relates the data obtained from interviews using sectorial analysis and AHP, so that results and conclusions are obtained from the suitability of data analysis. To find out the product development strategy of PT. Pindad for the development of the Indonesian defence industry carried out a process hierarchy analysis using the Super Decision 3.2 computer program.

III. RESULT AND DISCUSSION

A. Data collection

Based on the 4 (four) alternative defence industries that will be chosen in increasing the sales of the products to be selected, the researchers first collect data related to the Indonesian defence industry:

1) Rifles And Pistols

PT. Pindad has produced various types of weapons ranging from the SS2 assault rifle which has been recognized for its superiority and proven by the Indonesian National Army soldiers who won the AARM championship many times using this rifle. In addition to rifle PT. Pindad also produces sniper rifles (SPR) which have excellent shooting range and accuracy, various types and pistols of very good quality. Currently PT. Pindad has the ability to produce as many as 40,000 weapons every year.

2) Munitions

Munitions is one of the first products other than weapons produced by PT. Pindad was founded in 1808, at that time, Pindad was founded under the name Constructie Winkel (CW) by the Dutch to meet the needs of its munitions. Along with the developments made by Pindad in order to improve the quality of its production, currently Pindad is able to produce 600 million rounds of munitions annually with various calibre sizes

3) Personnel Transport Vehicles

The reliability and superiority of Panzer production by PT. Pindad has been tested and recognized by the world, this is evidenced by the 350 Panzer units used by the United Nations in various peace missions. Panzer produced by PT. Pindad has various types of variants and the advantages of each existing variant and currently PT. Pindad has developed the ability of existing Panzers by having amphibious capabilities, so that they can be used to deal with terrain in the sea and rivers.

4) Medium Tank

Medium Tank is the newest product of PT. Pindad, where Indonesia is the third country in the world capable of producing medium type tanks, which is currently carrying out system upgrades for mass production. This medium type tank is the result of a collaboration between PT. Pindad with FNSS Defence System which is a defence company from Turkey. Medium Tank made in Indonesia is considered very suitable for use in the tropics.

B. Determination of Criteria

In determining the criteria to be used for this literature research, the researcher first conducted research on the criteria that were considered to have weight, namely.

1) Product Technology

In developing the defence industry to support the availability of defence and security equipment and also increasing sales of the country's defence industry products to other countries, technological innovation is needed that adapts to the development of world technology today which has entered the era of technology 4.0. Development and innovation are needed as well as various breakthroughs in the development of defence industry technology in order to answer the challenges of today's technological developments to produce defence industry products that are full of high and latest technology.

2) Production capability

As a defence industry that is developing and competing with defence industries from other countries. PT Pindad in recent times is trying to develop and add and expand its production workshop area in order to increase the amount of production produced. In addition, in an effort to increase the amount of production PT. Pindad made several innovations, especially in the procurement of production machines so that maximum production results can be obtained.

3) Product quality

In facing competition with industries from other countries, PT. Pindad continues to strive to improve the quality of its products so that they can be equal and even exceed the capabilities and qualities of similar products produced by the defence industry from other countries. Production quality of PT. Pindad has been tested in several international events such as the International Army shooting championship. Where the Army contingent uses rifles produced by PT. Pindad SS2 variant and it is proven that the Indonesian Army has always been the overall champion in the shooting competition.

4) Material Content

For now, the material content used in producing PT. Pindad has not fully used local content, but from the composition used, local content is used more than imported materials. In the future PT. Pindad will continue to strive so that all products produced by PT. Pindad has 100 percent used local content to improve the nation's economy.

C. Data Processing with AHP

Hierarchy of product development strategy PT. Pindad for Indonesian defence industry development can be seen in Fig. 1

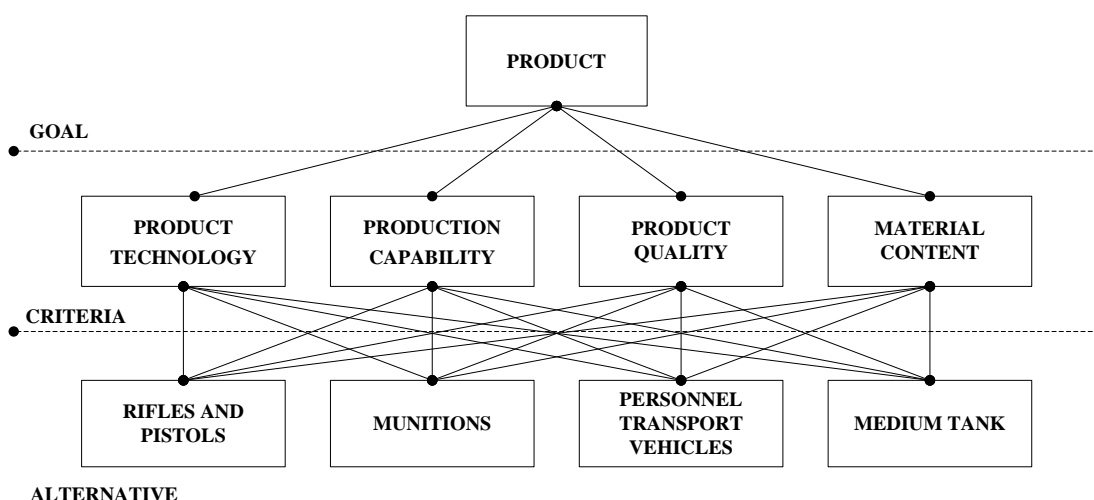


Fig. 1 Product development Strategy PT. Pindad for Indonesian Defence Industry

Before distributing the questionnaires and inputting the results of the questionnaires, the Analytical Hierarchy Process (AHP) model was developed for the purposes and criteria used by AHP to enable

dependencies both within a cluster (internal dependence) and between clusters (external dependence). Each variable at each level must be defined along with its relationship (based on the results of brain storming experts) with other elements in the system, as shown in Fig. 2 below:

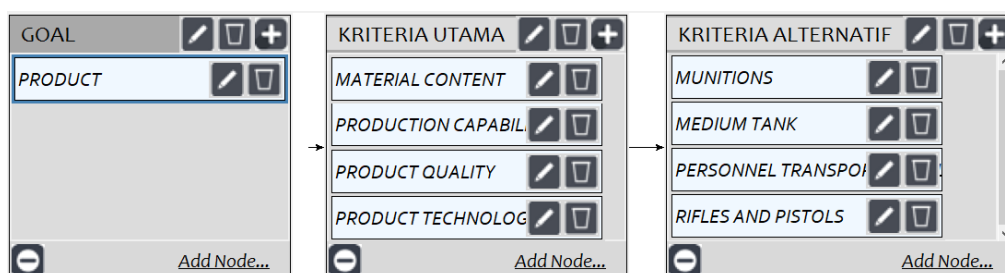


Fig. 2 Network Goal Model, Criteria and Alternatives

After the network model is created, the pairwise comparison value between criteria and alternatives for each criterion can be determined. The pairwise comparison value was obtained using a questionnaire. The priority weight value for each category obtained based on the pairwise comparison value will be compared to get the final priority weight value. The data that has been obtained from the questionnaire distribution is in the form of pairwise comparison between the criteria and alternatives. Assessments from experts will be combined using the geometric mean formula (geometric mean). Furthermore, the calculated geometric mean is then entered into the pairwise comparison matrix in the Super Decision 3.2 software, as Fig.3 below:

Network	Judgments	Ratings
1. Choose	2. Node comparisons with respect to PRODUCT	
Node Cluster	Graphical Verbal Matrix Questionnaire Direct	
Choose Node	Comparisons wrt "PRODUCT" node in "KRITERIA UTAMA" cluster	
PRODUCT	PRODUCT QUALITY is equally to moderately more important than MATERIAL CONTENT	
Cluster: GOAL		
Choose Cluster		
KRITERIA UTAMA		
	1. MATERIAL CON~	>=9.5 9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9 >=9.5
	2. MATERIAL CON~	>=9.5 9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9 >=9.5
	3. MATERIAL CON~	>=9.5 9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9 >=9.5
	4. PRODUCT QUAL~	>=9.5 9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9 >=9.5
	5. PRODUCT QUAL~	>=9.5 9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9 >=9.5
	6. PRODUCT TECH~	>=9.5 9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9 >=9.5

Fig. 3 Pairwise Comparison

In addition to filling in the Geomean value in pairwise comparison, inconsistency values must also be considered. The inconsistency value should not exceed 0.1. If a score > 0.1 is obtained, a re-questionnaire must be carried out, but if it is still worth > 0.1 then the researcher must look for other sources who better understand the problem being studied. The following is the inconsistency value of the weighting of this study can be seen in Fig.4 below:

3. Results	
Normal	Hybrid
Inconsistency: 0.06948	
MATERIAL ~	0.10124
PRODUCT Q~	0.17687
PRODUCT T~	0.50744
PRODUCTIO~	0.21444

Fig. 4 Value Inconsistency

The results of the analysis using the Analytical Hierarchy Process (AHP) show that the leading criteria sector at PT. Pindad which ranks first is the Product Technology sector with the highest score of 0.50745,

Production Capability with a value of 0.21444, and Product Quality 0.17687 and for Material Content with a value of 0.10124. While the alternative sectors chosen were Personnel Transport Vehicles with the highest score of 0.48243, Medium Tanks with a score of 0.29246, Rifles And Pistols with a score of 0.15129 and Munitions with a score of 0.07383. Based on the results that have been obtained from the AHP analysis, it is very significant both in the Criteria sector and in the alternative sector, this shows that the results of Product Technology and Personnel Transport Vehicles at PT. Pindad gets priority in industrial product development. In order to find out the strategies used in leading sector development policies, the government must first identify the priority strategies used.

Icon	Name	Normalized by Cluster	Limiting
No Icon	PRODUCT	0.00000	0.000000
No Icon	MUNITIONS	0.07383	0.036914
No Icon	MEDIUM TANK	0.29246	0.146228
No Icon	PERSONNEL TRANSPORT VEHICLES	0.48243	0.241215
No Icon	RIFLES AND PISTOLS	0.15129	0.075644
No Icon	MATERIAL CONTENT	0.10124	0.050622
No Icon	PRODUCTION CAPABILITY	0.21444	0.107219
No Icon	PRODUCT QUALITY	0.17687	0.088436
No Icon	PRODUCT TECHNOLOGY	0.50745	0.253722

Fig. 5 Final weight of criteria and alternatives.

IV. CONCLUSION

Based on the analysis and discussion that has been carried out using the super decision, it can be concluded that the results of the Analytical Hierarchy Process (AHP), the priority criteria for the production development strategy at PT. Pindad consists of Product Technology, Production Capability and Production Quality and Material Content. Product Technology priority policy occupies the first priority with a weight value of 0.50745, followed by Production Capability with a weight value of 0.21444, followed by Product Quality with a weight value of 0.17687, and Material Content with a weight value of 0.10124. Then in the alternative sector, Personnel Transport Vehicles occupied the highest score with a weight of 0.48243, followed by Medium Tanks with a value of 0.29246, Rifles and Pistols; with a weight value of 0.15129, the last one is Munitions with a weight value of 0.07383. The main policy priorities in developing leading sectors towards product development strategies are Product Technology as a criteria sector and Personnel Transport Vehicles as an alternative sector. Increasing Product Technology Personnel Transport Vehicles which is supported by product marketing innovations can increase the number of Personnel Transport Vehicles sales made by PT. Pindad. The need for innovation and technological development used in Personnel Transport Vehicles products made by PT. Pindad to be able to compete and become the world's best product in the manufacture of Personnel Transport Vehicles.

REFERENCES

- [1] C. L. Lee and W. Y. Wang, "Strategy, accountants' activities and new product development performance," *Adv. Account.*, vol. 50, p. 100487, 2020, doi: 10.1016/j.adiac.2020.100487.
- [2] T. Wicaksono and A. A. B. Perwita, "The Military Industrial Complex In a Developing Country: Lessons from the Republic of Turkey," *J. Hub. Int.*, vol. 9, no. 1, 2020, doi: 10.18196/hi.91162.
- [3] R. Carril and M. Duggan, "The impact of industry consolidation on government procurement: Evidence from Department of Defense contracting," *J. Public Econ.*, vol. 184, p. 104141, 2020, doi: 10.1016/j.jpubeco.2020.104141.
- [4] T. N. Habsari, "PT Pindad's Strategy towards Defense Industry Independence," *Int. J. Soc. Sci. Hum. Res.*, vol. 05, no. 02, pp. 666–673, 2022, doi: 10.47191/ijsshr/v5-i2-37.
- [5] B. Giersing *et al.*, "Strategies for vaccine-product innovation: Creating an enabling environment for product development to uptake in low- and middle-income countries," *Vaccine*, vol. 39, no. 49, pp. 7208–7219, 2021, doi: 10.1016/j.vaccine.2021.07.091.
- [6] M. A. A. Shiddiqy, A. Bainus, W. S. Sumadinata, and A. Sudirman, "The development of the Indonesian defence industry as a

- consequence of security dilemma and arms race in the Southeast Asian Region," *Int. J. Innov. Creat. Chang.*, vol. 10, no. 5, pp. 214–226, 2019.
- [7] F. Triantama, "Kerjasama Pengembangan Medium Battle Tank Harimau Sebagai Perwujudan Ketahanan Alutsista Tentara Nasional Indonesia," *J. Ketahanan Nas.*, vol. 26, no. 2, p. 273, 2020, doi: 10.22146/jkn.56116.
- [8] S. A. Arsita, G. E. Saputro, and A. Sarjito, "Implementation of Trade-off, Local Component, and Offset Policy Pt. Pindad (Persero) in Supporting the Defense Economy," *J. Econ. Manag. Trade*, vol. 27, no. 7, pp. 42–52, 2021, doi: 10.9734/jemt/2021/v27i730355.
- [9] A. Prayitno, S. J. Raharja, E. Maulina, . R., and A. Muftiadi, "Multiple Managers, Competing Strategies and Business Unit Performance: A Case Study of PINDAD Company, Indonesia," *Int. J. Adv. Sci. Technol.*, vol. 105, pp. 51–64, 2017, doi: 10.14257/ijast.2017.105.05.
- [10] T. Ahmad D.P, Y. Martinus Pasaribu, and A. Bagus Sriwarno, "Strategi Pengembangan Produk Terintegrasi Dan Modular (Ppt-M) Pada Litbang Desain Rantis Komodo Di Pt Pindad," *J. Sositologi*, vol. 15, no. 1, pp. 106–123, 2016, doi: 10.5614/sostek.itbj.2016.15.1.10.
- [11] S. Hartati, A. Muhammad, K. Bayu, and M. Tasrif, "Indonesian Defense Industry Model Concept: A Study Framework for Defense Industry Building," *J. Adv. Manag. Sci.*, vol. 2, no. 4, pp. 260–266, 2014, doi: 10.12720/joams.2.4.260-266.
- [12] Y. Bao, Z. Su, and C. H. Noble, "Determinants of new product development speed in China: A strategy tripod perspective," *Technovation*, vol. 106, no. November 2019, p. 102291, 2021, doi: 10.1016/j.technovation.2021.102291.
- [13] A. K. S. Fernando Situmeang, Imam Suyudi, "Strategy for the development of seaweed industry in Indonesia," *J. Def. Resour. Manag.*, vol. 11, no. 2, pp. 44–50, 2020, doi: 10.5530/srp.2020.2.08.
- [14] P. Amelia, A. Lathifah, and I. N. A. Yasa, "Analysis of the impact of maritime sector development in supporting Indonesian Navy Ship operations," *Procedia Comput. Sci.*, vol. 197, no. 2021, pp. 317–325, 2021, doi: 10.1016/j.procs.2021.12.146.
- [15] J. P. Pramitha, M. S. Sugandi, and A. Putra, "Strategi Produk Pemasaran Produk Pertahanan dan Keamanan PT Pindad (Persero)," *J. Penelit. Komun.*, vol. 22, no. 2, pp. 195–210, 2019, doi: 10.20422/jpk.v22i2.673.
- [16] L. G. Vargas, Thomas L. Saaty, *Models, Methods, Concepts & Applications of the Analytic Hierarchy Process*, vol. 175. London, 2012.
- [17] R. Mamola, C. Marsega, and W. Yulianti, "Strategi Pengembangan Wilayah Melalui Analytical Hierarchy Process (AHP) dengan Pendekatan Sectoral Economic Analysis di Provinsi Banten," *Inpire J. Econ. Dev. Anal.*, vol. 1, no. 1, pp. 31–46, 2021.
- [18] B. Cahyadi and A. Muzaqin, "Penerapan Metode Analytic Hierarchy Process (AHP) Dalam Pemilihan Supplier Plating PT. X," ... *Rekayasa dan Optimasi Sist. ...*, vol. 01, no. 1, pp. 9–17, 2019, [Online]. Available: <http://journal.univpancasila.ac.id/index.php/jrosi/article/view/236>.