

Defense Acquisition through Acceleration Of Defense Technology and Industry Mastering

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Abstract: Strength less regulation of defense acquisition system which accommodates the technology absorption process is a major problem for Indonesia. Low quality of human resources or the expertise of researchers and engineers also contributes to the slow absorption of technology. As long as these two basic problems are not resolved, development of technology and defense industry would not improve significantly. For this reason, a focused solution is needed to directly address these two problems. With a case study approach to development of technology and defense industry in South Korea, which only in last three decades has been able to match the development of developed countries for a century, this paper recommends three strategies to catch up with Indonesia in this field. First strategy, Integration of defense R&D institutions at the Ministry of Defense and all R&D forces into the Research and Development Agency and the Defense Technology Quality Assurance Agency aimed at optimizing technology absorption and producing quality and synergistic R&D products. Second strategy is reforming defense acquisition system and procedures through a single implementer directly under the Minister of Defense. These reforms are organizationally formalized in Defense Acquisition Institute which oversees Defense Technology Research and Development Agency and Defense Technology Quality Assurance Agency. The third strategy is improving Defense Acquisition Institute's human resources quality through a transparent and accountable recruitment process; Personnel placement according to the required qualifications and expertise; Productive and conducive work system and environment; Continuing education and training; Guarantee the integrity pact of every personnel involved; As well as Ombudsman-based supervision. R & D cooperation with defense R & D institutions outside Ministry of Defense and the TNI as well as Universities or the transfer of personnel status from these institutions to Defense Acquisition Institute can be a tactical solution to improve human resources quality. This three strategies are believed to be able to accelerate the mastery of defense technology and industry in Indonesia and end Indonesia's dependence on imported defense equipment.

Keywords: Acquisition, Defense Technology, Defense Industry

I. INTRODUCTION

Mastery and improvement of national defense capabilities through the purchase of defense equipment in Indonesia with a Transfer of Technology (ToT)-based program, here inafter referred to as technology transfer, has become leader in recent years. Technology transfer as the transfer of capabilities and technical know-how of modern technology from developed countries to developing countries, which is generally carried out in Indonesia through the Foreign Direct Investment (FDI) scheme, Technical Licensing Agreement (TLA) or also called Foreign Licensing (FL), and Capital Goods Import (CGI) (Thee, 2005). However, all of schemes in this technology transfer program have not been able to increase knowledge, improve skills, and expand the ability to organize and manage Indonesian human resources effectively. The main problem with this condition is that there is no specific regulation on technology transfer schemes, while the demands for mastery of technology are very high. Conflicts between several policies, distribution of rules across several institutions, ineffective

coordination and competition between institutions worsen Indonesia's ability to accept technology transfers (Thalib, 2014).

Several newly industrialized countries in Asia in the 1960s to 1990s known as Four Asian Tigers namely Hong Kong, Singapore, South Korea and Taiwan could be used as mirrors for improvement in Indonesia. These countries are also known as the first Newly Industrializing Countries (NICs) that have been able to compete internationally in last few decades. NIC's achievement is in principle obtained by focusing on strategy of mastering the technology that is most relevant to the country's needs, on the most profitable aspects, then assimilating, adapting and improvising the imported technologies (Thee, 2005). Of the four countries, South Korea is the most suitable to be used as a model in accelerating technology authorization and defense industry in Indonesia. In addition to its extraordinary achievements, South Korea also has strategic defense cooperation with Indonesia for land, sea and air defense equipment (SIPRI, 2017). Three strategies that are suitable to be applied in Indonesia with a more realistic and tactical approach. Thus, Indonesia can accelerate the mastery of technology and the defense industry to increase the dignity, prestige and honor of Indonesia in the world.

The development and improvement of National defense capabilities cannot be separated from technology controlling and the defense industry as meeting's core the needs of the main weapon system equipment (alutsista) for Indonesian National Army (TNI). Although it has been supported by regulations and opportunity for modernization of defense equipment which has been wide open recently, The technological and industrial capacity of Indonesia's defense industry remains low. The Indonesian government still faces a number of unresolved obstacles, requiring a well-formulated and coherent defense policy (RSIS Indonesia Program, 2012). The healthy development of national defense industry, dynamic technology, and maximum absorption capability require practical, robust and flexible policies. One important point is the requirement for strengthening defense research and development (R&D) capacity through technological offsets or international collaboration (RSIS Indonesia Program, 2013).

The problems mentioned above are identified as leading to the weak aspect of the defense acquisition system, where the defense equipment's procurement is only for meeting needs without being used as an opportunity to master the technology. Even if there is an offset scheme, technology transfer, or international cooperation in defense equipment's procurement, the second aspect, namely low capacity of defense R&D, has a significant impact on the failure of transfer of knowledge, capabilities, and methods in mastering technology and defense industry in Indonesia. As long as these two basic problems are not resolved, the technology development and defense industry will not improve significantly, which in the end, Indonesia will continue to rely on defense equipment's import.

From the background above, Author tries to examine how the government's readiness, in this case the Ministry of Defense, is facing a defense acquisition so that it formulates questions: "How is Defense Acquisition through Acceleration of Mastery of Defense Technology and Industry from South Korea?"

II. LITERATURE STUDY

According to Dien Prafitri Hangesti (2006) China has grown into a regional power to be reckoned with in East Asia. The increasingly rapid economic growth provides an even greater allocation for military development. Judging from the military spending budget which increases significantly every year, the modernization of military power both quantitatively and qualitatively shows the development of its military capability posture. China's increasing military posture has triggered reactions from other countries in East Asia. For the unit of analysis for the group of nation states, the Cold War period is used to explain a balance of power formation in East Asia. Meanwhile, for unit of explanation of nation-state, the period from 1990 to 2005 is used as a limit to show the increase in China's military capabilities which gained momentum after Cold War. After data and information related to research problem were collected and analyzed, several findings were obtained. Based on these data findings, it is concluded that increasing China's military capability has implications for East Asian security stability in terms of causing disruption of power balance. The data findings state that the East Asian security situation due to changes in China's military capabilities, seen from the various conflicts that occurred, affected the power balance in East Asia. These conflicts include issues of sovereignty claims such as China-

Taiwan conflict, territorial issues and the struggle for resources. Another finding is that China's military capability's increase has received a response from East Asian countries, in addition to strengthening alliances, also strengthening defense through the military equipment acquisition that can lead to an anarchic arms race.

A large country must be guarded by a professional, strong, modern and respected army, this army will only be realized if it is supported by a solid economy so that it is able to support the development of an appropriate strength posture, a strong economy can only be realized if all citizens of the nation are aware of the importance of maintaining stability, security, order, and comfortable living in the community by keeping away from all kinds of affairs that are detrimental and drain the nation and state energy. (Bayu Setya Romansyah: 2015). Participating in International World, the belief in being able to buy and own a modern defense system like Leopard tank to maintain the sovereignty of the Republic of Indonesia is also followed by a great responsibility to continue to actively participate in maintaining world peace.

According to Sunya Herawati (2019) In research the company's financial performance is measured through financial ratios using variables Current Ratio (CR), Total Asset Turnover (TATO), Fixed Asset Turnover (FAT), Debt to Total Asset Ratio (DAR), Net Profit Margin (NPM), Return on Assets (ROA) and Earning Per Share (EPS) with a period of 2 years before and after mergers and acquisitions and 3 years before and after mergers and acquisitions. The hypothesis test used is Paired Sample t-test. Sample t-Test) and the Wilcoxon Signed Rank Test. The results from period of 2 years before and after mergers and acquisitions and 3 years before and after mergers and acquisitions showed that there were no significant differences in financial performance on several financial ratios such as CR, TATO, DAR, NPM and ROA. While the results of 2 years before and after mergers and acquisitions on financial ratios of earnings per share there are significant differences in financial performance compared to 3 years before and after mergers and acquisitions. For financial ratios of FAT for the period of 2 years before and after mergers and acquisitions in FAT financial ratios, there is no significant difference in financial performance compared to 3 years before and after mergers and acquisitions.

According to Bayu Widiyanto (2016), the development of defense technology in developed countries in the 21st century shows a very high acceleration, as well as increasing level of threat to a country. For this reason, Indonesia needs to develop and develop defense technology to be able to ward off emerging threats. The development of defense technology to achieve national defense independence can be carried out through an offset policy mechanism. This paper will discuss offset policy in building the national defense independence. The inputs given in this paper can later be used to advance Indonesia's defense independence, which is carried out through the development of an offset policy.

According to Romie O. Bura (2020), One of the principles used as a reference in the defense industry implementation, namely independence, independence in the defense industry coincides with the development of a strong foundation to maintain sustainability and prevent the collapse of a country, Indonesia and South Korea in 2009 signed a work The same applies to the fighter aircraft development, in the acquisition process of defense technology, the technology availability is main requirement in development, but in its development there are often problems such as technology licensing, especially critical technology elements (CTE) which are key technologies that play an important role in technology development. Simulator technology is one of the key technologies used in various aspects of aviation, besides that it requires a socialization regarding the benefits and effects of developing a fighter aircraft project. The purpose of this study was to analyze the multiplier effect. The method used in this research is a mixed-method based using PEST Analysis tools illustrated with PESTLEweb which is then used as a reference strategy for developing 4.5 generation fighter aircraft simulator technology: political, economic, social and technological fields that can support defense industry independence and multiplier effect of technology development on other fields.

According to R. Irza Marchario (2015) South Korea chose to continue cooperation with Indonesia in the KF-X/IF-X fighter jet development due to the 2014 South Korean F-35 acquisition. The agreement to manufacture this fighter aircraft was signed in 2010 and started in 2011, This project is targeted for completion in 2020. This KF-X/IF-X fighter jet will later be more sophisticated than the F-16 Fighting Falcon. The F-16 is the fourth generation, the F-35 is the fifth generation, and the KF-X/IF-X is in the middle or generation 4.5. The problem is that South Korea has an agreement to acquire 40 units of Lockheed Martin F-35 Joint Strike Fighters

generation 5 from the United States in 2014, such as the rational choice concept put forward by Elster J. The assumption is that humans are basically 'maximizing benefits' and 'minimizing risks'. in this context is the state. How did South Korea maximize the benefits related to the KF X / IF-X fighter jet development, what are the fighter jet benefits. Meanwhile, the results showed that South Korea needed tactical aircraft with stealth capabilities to infiltrate quickly without being detected by North Korean radar. Planes needed to control borders or Patrol Functions.

III. METHODS

The approach in this paper is library research form (Library studies). This research is by collecting data and information with various library sources such as journals, articles, publishing news on the websites of related institutions, and qualitative inspiration according to experts or experts, books, magazines. Literature studies can also come from reference books and the results of previous similar studies that are useful for obtaining a theoretical basis on the problem to be studied using data collection techniques by reviewing books, literature, notes, and various reports related to the problem to be solved. or a theoretical study, references and other scientific literature related to the culture, values and norms that developed in the social situation under study. (Mirzaqon & Purwoko, 2018)

This study uses data collection techniques through documentation by reviewing and/or exploring several journals, books, and documents (both printed and electronic) as well as other sources of data and or information deemed relevant. With research or studies (Supriyadi, 2017).

IV. RESULT AND DISCUSSION

1. Defense Technology Authorization in South Korea

Since being separated from Korean War in the late 1950s, South Korea has been in a slump with poor natural resources and low educated human resources. In 1962, South Korea launched the First Five Year Economic Development Plan program, which, among other things, focused on increasing the level of education and the absorption of new technologies. Through this policy, 100% of South Koreans succeeded in carrying out basic education in 1970. The government also provided large-scale scholarships to its citizens to get higher education at the world's best universities.

In contrast to developing countries which rely on FDI and FL schemes to absorb new technology, South Korea actually does so with long-term foreign loan schemes. The loan proceeds are then used to finance industrial investments of the type determined by the government. This investment encourages massive imports of high-tech goods with the CGI scheme and strategic industrial development. Furthermore, the industry performs reverse engineering to obtain the necessary technology from the imported goods. This reverse engineering process involves synergistic collaboration between industry, universities and R&D institutions.

This approach had two important roles in the early development of South Korea, namely helping the industry to master new technologies and attracting researchers and engineers from outside South Korea. In 1980, South Korea had only 321 industrial R&D laboratories with 5,100 researchers, of which only 56 were Ph.D. Twenty-seven years later it developed into 14,975 laboratories with more than 190,000 researchers including around 10,000 Ph.D. graduates. Thus, the technological developments achieved by South Korea over the past three decades exceed those of industrialized countries in America and Europe for a century (Chung, 2009).

2. Defense Research and Development Process

As explained earlier that in order to absorb defense technology effectively and efficiently, South Korea focuses on technology transfer on ADD and defense industry. ADD is the only defense research institute in South Korea and has been transformed into a world-class defense research institute. ADD contributes to strengthening and achieving national defense independence by conducting surveys, research, development, and testing of weapons, equipment, and supplies needed for national defense including the scientific and technological aspects contained in the defense materials (ROK Act Number 13238, 2015, Article 1).

The R&D process for defense materials is carried out and led by ADD after it has been approved and ratified by DAPA. To carry out its defense R&D function, ADD is equipped with an R&D center for land weapons systems, maritime and underwater weapons systems, air and guided missile systems, electronic and information warfare, as well as a core technology R&D division, which is the latest technology commonly used in majority of weapon systems. As for the R&D materials test and evaluation and acceptance tests of purchased materials, ADD has comprehensive and accountable test facilities for all dimensions as well as test and evaluation materials for defense materials (ADD, 2012a).

Parallel to ADD, DTaQ carries out defense technology planning, defense quality management, defense material certification, defense technology intelligence, and defense technology promotion (ROK Act No. 13238, 2015, Article 32; DTaQ, 2015). With this function, DTaQ and ADD coordinate to produce R&D materials in accordance with the planning and technical specifications of DTaQ. As for the Armed Forces, ADD coordinates in confirming the requirements proposed by the relevant units. Under certain conditions, ADD has the right to use facilities and supplies in the Armed Forces unit if necessary to carry out its duties (ROK Act No. 13238, 2015, Article 21). ADD can also carry out R&D projects together with Industry, Universities, and other R&D Institutions. Industry can be involved in prototype manufacturing as well as mass production. Meanwhile universities and R&D institutions can be involved in basic R&D as well as core technology applications (ADD, 2012b). In relation to R&D cooperation, ADD remains as the project leader. The ownership of intellectual property rights (IPR) from R&D results must be owned by the state and ADD, or jointly owned with related institutions through agreements. DAPA and ADD can grant their IPR licenses to research institutions for development or to the defense industry for mass production (ROK Act No. 14610, 2017, Article 31-2).

3. Development of Defense Technology

The development of South Korea's defense technology is no less fast than the development of other technologies. With the same principles and approach, South Korea's defense technology has advanced further with the start of the offset program in 1983. Through this offset program, South Korea is able to export its products abroad, support the production of domestic defense technology, carry out independent maintenance and repairs, and facilitate technology transfer from other countries. The South Korean government strongly supports international cooperation projects that focus on developing technology from developed countries in the form of international research collaborations, technological cooperation with developed countries, and other cooperation. South Korea cooperates with 16 developed countries, of which America, Britain, Germany, France and Italy are the top five countries associated with offset programs (Lee & Lee, 2013).

The implementation of South Korea's defense offset program consists of two categories, namely export and technology transfer schemes. The export scheme is very profitable for South Korea in the form of providing jobs and building a defense industrial base. Meanwhile, through the technology transfer scheme, South Korea gets a package of technology data, technical assistance and support, education and training, technology know-how, and so on. The technology obtained through this scheme is generally absorbed through the human power sector and applied through research programs, manufacturing processes, and operation and maintenance of defense materials. Recently, South Korea has focused its defense offset program on technology transfer schemes (Han & Park, 2004).

Since the 1990s, South Korea has focused on developing state-of-the-art high-tech weapons. To effectively absorb the technology payload, South Korea established the Agency for Defense Development (ADD) as a key player who is prioritized as a recipient of technology transfer and training. While the defense industry occupies the second position as a recipient of technology transfer. Aircraft and missile technology is the largest industrial group that accounts for 60% of the total achievements of the defense offset program. The next largest industrial groups are communications and electronics with 11% and ships with 10%. Meanwhile, small caliber weapons and artillery, ammunition and explosives, and military vehicles are the smallest industrial groups with less than 5% each (Han & Park, 2004).

4. Defense Acquisition System

All achievements and mastery of defense technology achieved by South Korea are inseparable from dynamic regulations following the times. To reform transparent defense acquisition activities and avoid corruption, on January 1, 2006, South Korea established the *Defense Acquisition Program Administration* (DAPA). This special state agency under the *Ministry of National Defense* (MND) is responsible for enhancing defense capabilities, procuring military material needs, and promoting the defense industry (ROK Act No. 13593, 2016, Article 33). The entire defense acquisition process, from the latest high-tech materials to the provision of equipment for field personnel, is carried out by DAPA. In addition, DAPA is also tasked with managing defense capability improvement projects, issuing defense industry regulations, export-import regulations on defense materials, budget formulations, as well as conducting research, analysis, testing, and evaluation of defense technology for land, sea, and air dimensions. *Defense Agency for Technology and Quality* was formed and is aligned with ADD under DAPA.

The defense acquisition process for the Armed Forces in South Korea which includes the *Republic of Korea (ROK) Army, Navy, Air Force*; entirely managed centrally by DAPA. The acquisition procedure begins with a proposal for defense material requirements submitted by each of the staff Chief of the force. Furthermore, the chiefs of staff who are members of the *Joint Chiefs of Staff* (JCS) and MND conduct a joint analysis to finalize these needs by considering strategic objectives in joint operations and efficiency. The involvement of military organizations in defense acquisitions has only reached this stage, because then the defense material needs are managed by DAPA. After the DAPA is successful in procuring, the material is handed over to the Armed Forces for use, maintenance, and removal.

DAPA carries out preliminary analysis for the acquisition planning, including the budget plan for the proposed requirements it receives. From the results of this analysis, DAPA can determine alternatives for the proposals it receives in two solutions, namely purchasing or R&D. The purchase itself can be in the form of local procurement from national industries, imports from abroad, or leases. Meanwhile, R&D is carried out with the independence's spirit supported by credible personnel and institutions to produce a prototype as an initial product. DAPA's full involvement only extends to the tests and evaluations carried out by ADD based on the technical requirements prepared by DTaQ for the R&D prototypes as well as the purchased materials. After that, DAPA functions to provide assistance in the flow of mass production, bulk purchases, delivery to users, operational use, maintenance, to the removal of these materials (ROK Act No. 14610, 2017; DAPA, 2017).

In order to maintain DAPA as a credible, efficient, and professional institution, several regulations have been imposed on the personnel who oversee this institution. Each position in DAPA has certain qualifications and expertise requirements to support its function in carrying out planning, research, engineering, analysis, testing, evaluation, and so on (ROK Act No. 14610, 2017, Article 7). These qualifications and skills are mainly expressed through postgraduate formal education requirements, courses, scientific publications, work history and other additional requirements to occupy positions that are appropriate for their level. DAPAs are led by civilian officials and manned by civilian or military personnel who meet the requirements above. To improve personnel performance, MND and DAPA may provide grants and prizes to personnel who successfully research and develop superior defense materials or core technologies connected to these materials (ROK Act No. 14610, 2017, Article 40). But on the other hand, to increase transparency and anticipate corruption and irregularities, MND and DAPA require everyone involved in defense acquisition program activities to declare an integrity pact. The integrity pact contains prohibitions on soliciting, promising, giving, and receiving of any kind of value from the people involved in the acquisition. DAPA personnel and those involved with the project are also prohibited from conveying information related to the defense acquisition program to those who are not entitled. In addition, DAPA also operates an internal Ombudsman system to carry out investigations if things go wrong for further correction or prosecution (ROK Act). No. 14610, 2017, Article 6).

5. Strategy for Accelerating Mastery of Defense Technology and Industry in Indonesia

From a legal perspective, the Government of the Indonesia Defense Ministry (Kemhan) is the institution responsible for fostering defense technology and industry (UU No. 3 of 2002, Article 16 (6), Article 20 (2),

Article 23; Law No. 34 of 2004, Elucidation of Article 3 (2); Law No. 16 of (2012). Regulations on mastery of technology and defense industry through technology transfer and offsets have also been regulated in general through the General Policy on National Defense 2015-2019 (Perpres No. 97 of 2015). With this foundation and linked to current developments in technology and the defense industry, the Ministry of Defense is in a strong position to provide solutions that focus on existing problems. In general, the solution needed is strengthening the acquisition system defense and improving defense R&D capabilities. Reflecting on the case study of South Korea, this paper suggests three strategies to catch up with Indonesia in mastering technology and the defense industry.

First strategy is the reform of defense acquisition systems and procedures through sole implementer of defense material procurement directly under the Minister of Defense. The sole implementer in the form of the Defense Acquisition Institute (LAP) can synergize all resources optimally, effectively and efficiently in defense equipment procurement process to support the Defense and TNI strategic plans. The big idea in this strategy is positioning TNI as a professional army by reducing TNI involvement in defense equipment procurement process so that TNI can focus on training and developing its operational capabilities. As illustrated in Figure 1, through the new systems and procedures, TNI involvement in acquisition process is proposing the needs of each dimension through each Chief of Staff of the Forces. Furthermore, the Minister of Defense, the TNI Commander, and the Chief of Staff of the Forces evaluate and decide on the need for defense equipment by referring to the needs analysis and defense strategic plan. Then procurement process is carried out by LAP through purchasing and R&D programs. The purchasing program is carried out on the basis of domestic and imported industries with a technology transfer scheme, both of which play a role in absorbing new technology. The R&D program is carried out by LAP to produce a prototype that is in accordance with the technical requirements that have been formulated in the acquisition plan. Mass production can be carried out by industries involved in R&D programs or through open tenders. Furthermore, The defense materials that have passed the test and evaluation by the LAP will be handed over to TNI unit that proposed it. This strategy is the most challenging part because in addition to requiring coordination and synergy between stakeholders, it is also technically directly related to changes in the regulations for defense equipment procurement implementation along with its derivative regulations (Permenhan No. 17 of 2014). Non - technical obstacles in maintaining the status quo of acquisition system are no less challenging, so a strong political will is needed from the Ministry of Defense as a regulator, stakeholders, and other related parties.

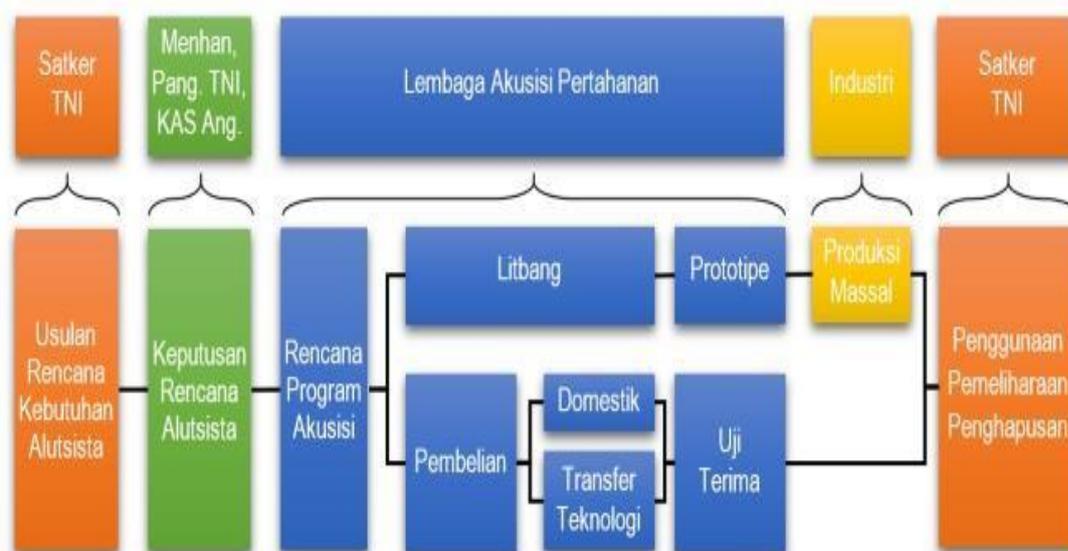


Figure 1. Indonesian Defense Acquisition System and Procedures

Integration of defense R&D agencies is a second strategy that is no less important and challenging to implement. The defense R&D institutions separation in the Ministry of Defense and each force causes new technology absorption process to be weak, R&D programs uncoordinated, leading to a waste of budget and resources. The integration of all defense R&D institutions into the Defense Technology Research and Development Agency (Balitbang Tekhan) under LAP into an organization like Figure 2, is the only solution for optimizing technology absorption and producing quality and synergistic R&D products. Balitbang Tekhan is the implementer of LAP in R&D programs, technology transfer, to technical assistance. Completeness of Balitbang Tekhan consists of Research and Development Center for Core Technology, Land Force Technology, Marine Meter Technology, Air Force Technology, and also Test and Evaluation Center. In addition to Balitbang, it is also necessary to distribute resources from the old R&D institutions to Defense Technology Quality Assurance Agency (BPM Tekhan) for technology planning function and needs analysis based on systems engineering, quality management, defense material certification, as well as cross-institutional R&D coordination. Organizationally, the Echelon structure can be applied in accordance with the duties, functions, and authorities of each position in this institution.

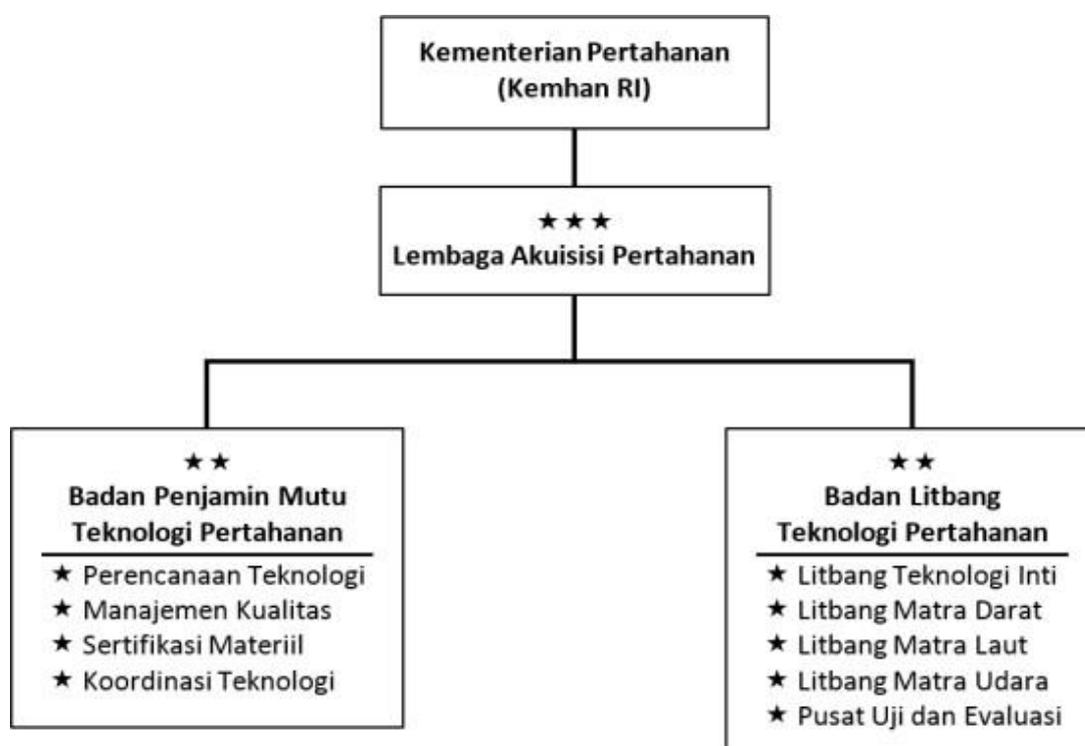


Figure 2. Organization of the Indonesian Defense Acquisition Institute

It must be admitted that low qualifications and expertise of researchers in each R&D institution currently exacerbates the backwardness of technology and the Indonesian defense industry. To that end, the third strategy relates to improving the quality of human resources that oversee LAP, particularly functions of researchers, engineers, analysts, and quality assurance. To get personnel in accordance with the function of their field of work, clear regulations are needed in recruitment through the requirements of appropriate qualifications and expertise. For example, formal research qualifications are obtained through doctoral education from universities that are officially recognized by the government (Law No. 12 of 2012, Article 20). Other qualifications and expertise requirements can be adjusted to the field of workfunction. Meanwhile, to increase productivity, it is necessary to make regulations where LAP personnel can focus on carrying out the functions of researchers, engineers, analysts, quality assurance, and other technical functions, without burden of excessive administrative responsibility. On the other hand, to increase accountability and anticipate abuse of authority, each LAP

personnel is required to fill out and sign an integrity pact. In addition, an Ombudsman-based reporting system can be implemented for stricter oversight of procedures.

The tactical solution for quality LAP manning is to carry out collaborative research and development programs with several government institutions outside the Ministry of Defense and TNI related to defense technology as well as transferring the status of personnel from these institutions to LAP. The institutions in question include Center for Defense and Security Industrial Technology, the Agency for Assessment and Application of Technology (PTIPK BPPT, 2017); Center for Defense and Security Technology, Bandung Institute of Technology (Pustekhankam ITB, 2017); and the Faculty of Defense Technology, Defense University (Unhan, 2016). The manning of civilian and military personnel in LAP can be adjusted according to program-based needs, qualifications, and required expertise. Furthermore, education and training related to their main functions and duties are carried out in stages and continuously.

V. CONCLUSIONS

The development of South Korea in just the last three decades has been able to match the development of developed countries for a century. A case study of South Korea's mastery of technology and defense industry can be a solution to catch up with Indonesia in this field. Reflecting on South Korea, three strategies that are suitable for Indonesia's conditions are proposed in this paper to overcome the problems identified above. The first strategy is to reform the defense acquisition system and procedures through a single implementer directly under the Minister of Defence. These reforms are organizationally formalized in the Defense Acquisition Institute which oversees the Defense Technology Research and Development Agency and the Defense Technology Quality Assurance Agency. The integration of defense R&D institutions at the Ministry of Defense and all R&D forces into the Research and Development Agency and the Defense Technology Quality Assurance Agency is the second strategy aimed at optimizing technology absorption and producing quality and synergistic R&D products. The final strategy is to improve the Defense Acquisition Institute's human resources quality through a transparent and accountable recruitment process; Placement of personnel according to the required qualifications and expertise; Productive and conducive work system and environment; Continuing education and training; Guarantee the integrity pact of every personnel involved; As well as Ombudsman-based supervision. R & D cooperation with defense R & D institutions and universities or the status transfer of these personnel to the Defense Acquisition Institute can be a tactical solution to improve human resources quality. The three strategies are believed to be able to accelerate the mastery of defense technology and industry in Indonesia and end dependence on imported defense equipment.

Indonesia's main problem in mastering technology and the defense industry is the weak regulation of the defense acquisition system to accommodate the technology absorption process. Another problem is low qualifications and expertise of researchers and engineers, which exacerbates the slow absorption of defense technology. As long as these two basic problems are not resolved, The development of technology and defense industry will not improve significantly, which in the end Indonesia will continue to rely on the defense equipment import. For this reason, a focused solution is needed to directly address these two problems.

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