

THE DEVELOPMENT STRATEGY IN SUPPORTING MATERIAL MAINTENANCE AND DEVICES OF THE INDONESIAN NAVY

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ABSTRACT

The Eastern Region Material Maintenance Unit (Satharmattim) is a Technical Implementing Element (UPT) located directly under the Indonesian Navy Material Service (Dismatal) which is in charge of carrying out supervision, controlling the implementation of Depot Maintenance (Har Depo), and capacity building and carrying out the development of the planned Maintenance System (SPT) of ships and combat materials. Due to the many shortcomings and limitations in carrying out the material maintenance function, it is necessary to formulate a development strategy to support the function of material maintenance and defense equipment development in the Indonesian Navy. The stages of this research include the identification of internal and external strategic factors; analyzing alternative priority strategies through Matrix Space and SWOT; determine the best alternative strategy with Borda; set strategic goals and strategic maps with the Balance Score Card (BSC) and set Key Performance Indicators (KPI). The research method used is SWOT, Borda and BSC analysis. The results of the identification in Satharmattim contained seventeen internal factors and fourteen external factors that were used as a reference for the formulation of development priority strategies. Then the SWOT analysis process is carried out and produces seven alternative priority strategies. The results of the weighting, the best alternative strategy is WO1 which is to Validation of Satharmattim Organizations and Procedures (Orgaspros) by utilizing the policies of the President, the Ministry of Defense, and Chief of Indonesian Navy which regulates the maintenance of materials and the development of the Indonesian Military's strength to become the world's maritime axis. Then, the SWOT analysis translated into strategic goals that form a cause-and-effect relationship. There are twenty strategic targets divided into four BSC perspectives, namely financial, internal business, customer, and learning and growth with the determination of KPIs from these strategic targets. In strategy mapping, the internal business perspective is used as the main foundation perspective with the best strategy target, namely WO1, followed by a financial perspective, learning and growth perspective finally a customer perspective.

Keywords: Borda, BSC, Eastern Region Material Maintenance Unit, KPI, SWOT.

1. INTRODUCTION

One of the main axes of the level of strength and operational capability that must be built, developed and owned by the Indonesian Navy is in principle based on the development of defense equipment and non-defense equipment strength followed by the ability to carry out maintenance and care of materials which are one of the elements of integrated logistics so as to support operational readiness and carry out the main tasks of the Indonesian Navy as an enforcer of state sovereignty at sea. Currently, the development of material maintenance is under the Indonesian Navy Material Service (Dismatal) which is the Central Implementing Agency (Balakpus) which is directly under the Chief of Staff of the Navy. Dismatal is tasked with carrying out material development which includes maintenance and removal of ships,

especially ship hulls and machinery systems as well as combat materials for landing troops in the Indonesian Navy environment. To achieve the implementation of these tasks, Dismatal is assisted by 2 Technical Implementation Elements (UPT) of the Material Maintenance Unit (Satharmat), namely the western region in Jakarta (Satharmatbar) and the eastern region in Surabaya (Eastern Region Material Maintenance Unit). Satharmat as a UPT that is directly under Dismatal is tasked with carrying out supervision, controlling the implementation of Depot Maintenance (Har Depo) and increasing capabilities as well as implementing guidance on the Planned Maintenance System (SPT) for ships and combat materials.

The Eastern Region Material Maintenance Unit has a very broad scope of work, namely Second Fleet and Third Fleet. In the implementation in the

field, there are several shortcomings and obstacles faced by the Eastern Region Material Maintenance Unit in carrying out the function of fostering the maintenance of combat materials and defense equipment in the eastern region. Several shortcomings and obstacles are reviewed from the aspects of Organization, human resources, facilities and infrastructure and geographical conditions, based on data taken from the Eastern Region Material Maintenance Unit. Currently, with the development of the posture and strength of the Indonesian Navy and the complexity of challenges and technological advances, both inside and outside the Indonesian Navy, there needs to be a strategic idea to develop the Eastern Region Material Maintenance Unit so that it is hoped that the implementation of material and defense equipment maintenance will be more orderly, coordinated and systematic.

Material maintenance coaching is an activity carried out in order to prepare the technical conditions of combat materials and defense equipment to support the development of the posture and strength of the Indonesian Navy in carrying out the main task of maintaining the sovereignty of the Republic of Indonesia in the sea area, which focuses on strengthening in the field of material maintenance as an effort to realize one element of combat logistics strength. In building Sea power, not only combat materials and defense equipment are needed, but also building the strength of facilities and infrastructure by utilizing the potential of the maritime industry in the base facility sector. Therefore, in formulating the Eastern Region Material Maintenance Unit development strategy, it is necessary to pay attention to the position in the organizational structure, human resources, facilities and infrastructure and geographical conditions. This study will use the integration of the strength, weakness, opportunity, threat (SWOT) analysis method, the Borda weighting method and strategic mapping using the Balance Score Card (BSC) and Key Performance Indicator (KPI) in formulating priority strategies for developing the Eastern Region Material Maintenance Unit.

Based on the background description, from the identification of problems that occur and the limitations of the research above, the problems that can be formulated and drawn from several questions in the research, including how to determine the concept of priority strategies for developing the Eastern Region Material Maintenance Unit, how to formulate strategic targets from the best priority strategy, how to determine Key Performance Indicators based on strategic targets.

2. LITERATURE REVIEW

2.1 SWOT Analysis

SWOT analysis is the identification of various factors to formulate a company's strategy. This

analysis is based on logic that can maximize strengths and opportunities, but at the same time can minimize weaknesses and threats. The company's strategic decisions need to consider internal factors that include strengths and weaknesses as well as external factors that include opportunities and threats. Therefore, there needs to be important consideration for SWOT analysis. In identifying various problems that arise in the company, very careful research is needed so that it can find a very fast and precise strategy in overcoming the problems that arise. Strength and weakness factors exist in a company, while opportunities and threats are environmental factors faced by the company concerned.

It can be said that SWOT Analysis is a powerful instrument in conducting strategic analysis, the power lies in the ability of the company's strategy makers to maximize the role of strength factors and utilization of opportunities so that it acts as a tool to minimize weaknesses in the company and suppress the impact of threats that arise and must be faced. IFAS (internal strategic factory analysis summary) in other words, the internal strategic factors of a company are arranged to formulate internal factors within the framework of strengths and weaknesses. While EFAS (external strategic factory analysis summary) in other words, the external strategic factors of a company are arranged to formulate external factors within the framework of opportunities and threats. Weighting is done using the Borda Method which is used to produce the final result in the form of a sequence of criteria from the most preferred to the least preferred. While the Balance Score Card is a performance measurement method that translates missions and strategies into various objectives and measurements, which are arranged into four perspectives: financial, customer, internal business, and learning and growth.

2.2 Key Performance Indicator

A Key Performance Indicator (KPI) is a measurable value that indicates how effectively an individual, team, or organization is achieving a specific objective. KPIs help organizations focus on performance metrics that are most important to their success. They are often aligned with strategic goals and are used to monitor progress over time. Effective KPIs are specific, measurable, achievable, relevant, and time-bound (SMART). Different industries and departments use different KPIs, such as revenue growth in business or mission readiness in the military. KPIs also promote accountability by making performance transparent and comparable. Regularly reviewing KPIs allows leaders to make informed decisions and adjust strategies as needed.

3. RESEARCH METHODS

This research uses a qualitative descriptive method to explore development strategies supporting material maintenance and devices within the Indonesian Navy. The study seeks to identify current challenges, strategic gaps, and areas of improvement in the Navy's logistics and technical support systems. Data collection involves both primary and secondary sources. Primary data are gathered through in-depth interviews with key stakeholders such as naval engineers, logistic officers, and defense policymakers. Secondary data include literature reviews, strategic documents, maintenance records, and defense white papers. The purposive sampling technique is used to select participants who have direct involvement and expertise in naval maintenance and logistics. A semi-structured interview format ensures flexibility while maintaining thematic focus.

In the data analysis stage in the study consists of two activities, namely data collection and processing. Data collection on the Eastern Region Material Maintenance Unit as the object of research. Data is obtained through literature study/document review, interviews and filling out questionnaires. Interviews and filling out questionnaires are given to experts to obtain internal and external factor data. Meanwhile, the purpose of compiling the questionnaire is to determine the amount of assessment weight for each criterion to obtain the rating amount. The results of the weighting will be known as the criteria that are the basis for compiling strategies which will then be given suggestions for improvement.

The research will also use a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis framework to evaluate the current strategy. Data analysis will follow thematic coding to identify recurring issues and strategic priorities. Thematic patterns are interpreted to derive strategic insights for future development. Validity is ensured through triangulation between interviews, documents, and observational data. Member checking is applied by validating findings with selected participants. Ethical considerations include informed consent and confidentiality of respondents. The research takes place over a period of three months, including data collection, analysis, and validation.

This questionnaire uses the Borda method, which is by using the ranking of each criterion. In its application, each respondent provides a ranking based on the existing selection criteria. For example, there are n selection criteria, the first criterion is given n points by the respondent, the second criterion is given $n-1$ points and so on. The data obtained from the interview and questionnaire were processed using the IFI and IFE Matrix, then processed using the SWOT Matrix to obtain the priority strategy for developing the Eastern Region Material Maintenance Unit. After obtaining the

results of this data processing, interviews and filling out further questionnaires with experts were continued to obtain priority strategies using the Borda Method, then the identification of Key Performance Indicators (KPIs) was carried out on priority strategies using the Balance Score Card method.

This methodology aims to produce actionable strategies grounded in real-world conditions of the Indonesian Navy. The focus is not only on internal organizational capabilities but also on external environmental factors. The findings are expected to contribute to policy recommendations and strategic planning. Ultimately, this study aims to strengthen operational readiness through improved material maintenance strategies.

4. ANALYSIS AND DISCUSSION

Identification of internal factors is carried out through interviews or questionnaires with experts. The first stage carried out is an interview to identify factors that influence the research objectives internally in the organization. The next stage is to carry out a questionnaire to obtain strength and weakness factors. According to (Rangkuti F, 2004) Positive variables are all variables that fall into the strength/opportunity category. While negative variables are all variables that fall into the weakness/threat category, by assessing the criteria with the following provisions: 1. Very lacking, 2. Lacking, 3. Many, 4. Very many. According to (Nazara, 2019), if the criterion value is greater than/equal to three (≥ 3) then the criterion is a strength/opportunity. If it is less than three (<3) then the criterion is a weakness/threat.

4.1 Identify factors

SWOT analysis identifies four key strategic factors: Strengths, Weaknesses, Opportunities, and Threats. Strengths are internal attributes that give an organization a competitive advantage, such as skilled personnel, advanced technology, or efficient logistics. Weaknesses are internal limitations or deficiencies that hinder performance, such as outdated equipment, lack of training, or poor coordination. Opportunities are external factors the organization can leverage for growth or improvement, like government support, technological advances, or strategic partnerships. Threats are external challenges that could negatively impact operations, such as geopolitical tensions, budget constraints, or regional instability. By identifying these factors, an organization like the Indonesian Navy can align its strategies to maximize strengths and opportunities while minimizing weaknesses and threats.

Table 1. IFI Matrix for Strength

NO	STRENGTH (S)	CODE	WEIGHT	RATING	SCORE
1	Main duties and responsibilities of the Eastern Region Material Maintenance Unit	S1	0,320	2,297	0,735
2	Legal basis of Eastern Region Material Maintenance Unit Organization	S2	0,200	1,516	0,303
3	Eastern Region Material Maintenance Unit Work Program	S3	0,240	1,888	0,453
4	Material and Logistics Support for Maintenance	S4	0,147	2,169	0,318
5	Bureaucratic Relations of Other Agencies/Organizations in the Indonesian Navy to Defense Equipment and Combat Materials	S5	0,093	2,491	0,233
TOTAL					2,042

Table 2. IFI Matrix for Weakness

NO	WEAKNESS (W)	CODE	WEIGHT	RATING	SCORE
1	Authority and responsibility of the Eastern Region Material Maintenance Unit's material maintenance development function	W1	0,097	2,169	0,211
2	Scope of Work Eastern Region Material Maintenance Unit	W2	0,105	2,169	0,228
3	<i>Time-Based Maintenance from Operational Schedule</i>	W3	0,038	1,783	0,069
4	Condition and Age of Defense Equipment Material	W4	0,028	2,297	0,065
5	Number of Human Resources Eastern Region Material Maintenance Unit	W5	0,097	2,491	0,243
6	Quality of Human Resources and Experts Eastern Region Material Maintenance Unit	W6	0,103	3,104	0,318
7	Material Maintenance Information System or KRI Data Base Bank for Equipment Readiness	W7	0,113	2,862	0,323
8	Capacity of facilities and infrastructure / Material Maintenance Shipyard	W8	0,095	2,491	0,236
9	Synchronization of Operational, Personnel and Material Development	W9	0,103	2,702	0,277
10	Defense Equipment Maintenance Budget Support	W10	0,077	2,169	0,167
11	Support for improving material maintenance facilities and infrastructure	W11	0,069	2,551	0,177
12	Special training and education on Base Maintenance Plan.	W12	0,074	2,862	0,213
TOTAL					2,526

Table 3. EFI Matrix for Opportunity

NO	OPPORTUNITY (O)	CODE	WEIGHT	RATING	SCORE
1	Eastern Region Material Maintenance Unit as a Technical Implementing Element under Dismatalsus regarding the Base Maintenance Plan.	O1	0,172	2,702	0,465
2	Location / Place (Base Maintenance)	O2	0,122	2,491	0,305
3	Cooperation and partnership relations with third parties (private) within the country	O3	0,094	2,048	0,193
4	Availability of domestic suppliers of supporting materials and spare parts	O4	0,067	2,491	0,166
5	Government policy in realizing the world's maritime axis	O5	0,144	2,352	0,340
6	The Indonesian Ministry of Defense's policy in developing the strength of the Indonesian Armed Forces	O6	0,139	2,551	0,354
7	The Chief of Naval Staff's policy governing the maintenance and care of the Indonesian Navy's defense equipment	O7	0,156	2,551	0,397
8	Chief of Naval Staff Policy on Synchronizing Force Development with Organizational Validation and Defense Equipment Modernization	O8	0,106	2,766	0,292
TOTAL					2,512

Table 4. EFI Matrix for Threat

NO	THREAT (T)	CODE	WEIGTH	RATING	SCORE
1	Geographical Conditions of Base Maintenance	T1	0,219	1,644	0,360
2	Foreign Cooperation Relations as the Subject of Transfer of Knowledge and Technology	T2	0,152	2,702	0,412
3	Availability of overseas suppliers of supporting materials and spare parts	T3	0,190	2,639	0,503
4	Quality of Experts outside the Indonesian Navy (3rd party)	T4	0,162	2,352	0,381
5	Recruitment of Civil and/or Military Expert Personnel in the field of material maintenance	T5	0,105	2,048	0,215
6	Development of the shipping industry in the Eastern Region Material Maintenance Unit work area sector	T6	0,171	1,888	0,324
TOTAL					2,193

Determining the formulation of alternative priority strategies for the development of the Eastern Region Material Maintenance Unit can use the Matrix Space SWOT. This method is carried out by finding the coordinates of the intersection point of internal factors and external factors in the Matrix Space

quadrant. The quadrant of the intersection point determines the concept of strategy that can be used as a development strategy for the Eastern Region Material Maintenance Unit to support the function of fostering maintenance of materials and Indonesian Navy Main weapon system tools.

Table 5. Evaluation Values and Matrix Space Coordinates

Variable	Evaluation Score	Matrix Space
Strength	2,042	-0,48
Weakness	2,526	
Opportunity	2,512	0,32
Threat	2,193	

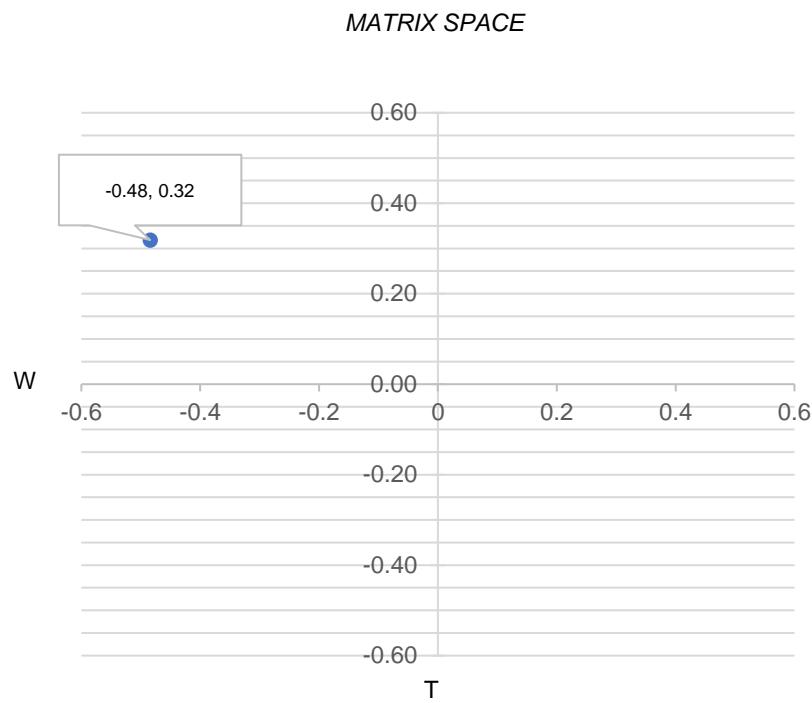


Figure 1. Matrix Space

From Figure 2, it can be seen that the coordinates of the intersection point of internal and external factors in the Matrix Space, namely (-0.48, 0.32) are located in quadrant II. Quadrant II is

identified as the active stability strategy quadrant, namely a strategy that actively utilizes opportunities by minimizing weaknesses, in order to improve weaknesses into strengths. The strategy concept in

quadrant II that can be used is the Weakness-Opportunity (W-O) strategy.

The SWOT matrix itself is a matching tool that can help research in analyzing strategies to develop the Eastern Region Material Maintenance Unit. The formulation of the W-O strategy concept in quadrant II of the SWOT Space Matrix by matching the W criteria with the O criteria of the Eastern Region Material Maintenance Unit so that it can produce an alternative strategy that is harmonious and supports organizational development. In compiling the WO strategy concept, the relationship between the strategy criteria in W and O to form a WO combination strategy formulation is adjusted to the

objectives to be achieved from this study. Then a comparison of matching and harmonious pairs of criteria is carried out to form a strategy formulation. Therefore, before formulating the priority strategy concept, interviews and discussions with Experts need to be carried out to determine the analysis of the relationship between criteria and to obtain considerations and validation of priority strategy data to be compiled. From the results of discussions and interviews with Experts, the results of 7 alternative priority strategy formulations were obtained which were determined as WO1 strategy, WO2 strategy, WO3 strategy, WO4 strategy, WO5 strategy, WO6 strategy and WO7 strategy.

Table 6. SWOT Matrix

SWOT MATRIX	STRENGHT	WEAKNESS
OPPORTUNITY	A strategy that takes advantage of opportunities by using strengths, in order to increase and develop strengths.	A strategy that takes advantage of opportunities by minimizing weaknesses, in order to improve weaknesses into strengths.
THREAT	Strategy to overcome threats by using strengths, in order to turn threats into opportunities	A strategy that avoids threats by minimizing weaknesses

Strategy WO1 is a combination of Weakness W1' (W1, W2, W10, W11) with Opportunity O1' (O5, O6, O7, O8) resulting in the Strategy Formulation "Validation of Organization and Procedure (Orgaspros) Eastern Region Material Maintenance Unit by utilizing the Presidential Policy, Ministry of Defense and Chief of Naval Staff that regulates material maintenance and development of TNI strength to become the world's maritime axis.". Strategy WO2 is a combination of Weakness W2' (W3, W5, W6, W9, W12) with Opportunity O1' (O1, O3, O6, O8) resulting in the Strategy Formulation "Organizing Base Maintenance Plan Provision and training activities to improve the quality of human resources and experts and increase the number of human resources through the Institution for accepting soldiers with qualifications in the field of maintenance by utilizing the position of Eastern Region Material Maintenance Unit as UPT Dismatal and the Policy of Ministry of Defense and Chief of Naval Staff regarding development of Indonesian Armed Forces strength".

Strategy WO3 is a combination of Weakness W3' (W4, W7) with Opportunity O3' (O3, O4, O6, O7) resulting in the Strategy Formulation "Strengthening

Technical Conditions and Regeneration of Defense Equipment Material and improving the Bank Data Base Information System technology by utilizing the Ministry of Defense Policy in developing TNI strength and the Chief of Naval Staff Policy on defense equipment maintenance including partner networks to support the availability of material/spare part supplies". Strategy WO4 is a combination of Weakness W4' (W8) with Opportunity O3' (O2, O3, O4, O7) resulting in the Strategy Formulation "Increasing the capability of material maintenance facilities and infrastructure/ shipyards located in various regions in Indonesia by utilizing partner networks and maritime industries and the availability of supporting material supplies and the Chief of Naval Staff Policy on material maintenance".

Based on the results of the formulation of priority strategy criteria by the Expert, a strategy ranking questionnaire was then administered to previous respondents to obtain the weighting of the criteria ranking. The following are the results of processing the strategy ranking weighting questionnaire data:

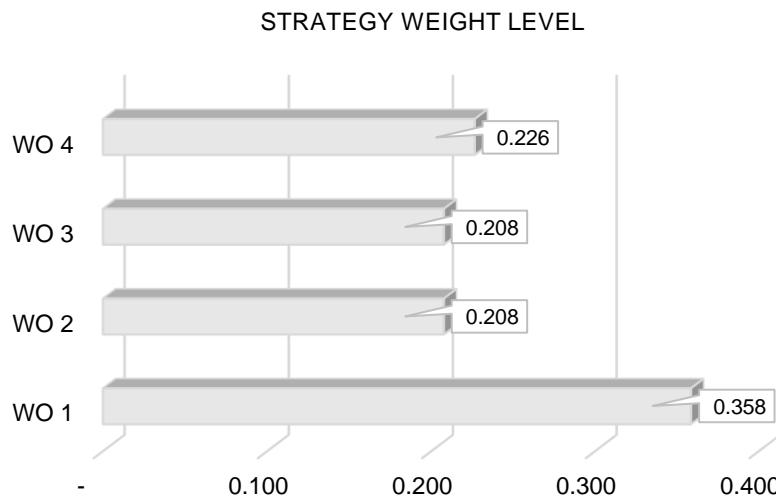


Figure 2. Strategy Weight Level

Programs that can be arranged and steps that can be taken from the priority strategies that have been selected through interviews with Experts to support the implementation of the Eastern Region Material Maintenance Unit development strategy in the form of strategic targets from each WO. After determining strategic targets, the next stage is to create a strategy map. The purpose of mapping strategic targets is to describe the strategy visually, through a number of strategic targets that are linked in a cause and effect relationship, so as to facilitate communication in strategic planning based on the Balance Score Card (BSC) perspective. According to Kaplan and Norton (2004), in the strategy map, the vision is explicitly translated into four perspectives, namely financial, customer, internal business process and learning and growth. The Internal Business Perspective is used as the main foundation perspective with the best strategic target, namely WO1, followed by the Financial Perspective, then the Learning and Growth Perspective and finally the Customer Perspective.

From the results of the identification of the four BSC and KPI perspectives, a strategy mapping is then carried out by compiling the relationship between the four perspectives. Starting from Internal business which assesses the size and synergy in efforts to develop internal conditions in the organization in accordance with the methods and regulations set, in this case the WO1 strategy target as the main foundation for running other aspects, then Financial which assesses the ability to manage finances and budgets well in order to support efforts to develop the organization and resources, then Learning and Growth which assesses the size of the ability to improve HR to run performance and operational systems for the interests and goals of the organization and Customer which assesses efforts to prepare technical conditions for combat materials and defense equipment to support the operations of

defense equipment crews, so that they can carry out tasks and operational orders well, tactically and safely. To describe the strategy visually through a number of strategic targets that are linked in a cause and effect relationship, so as to facilitate communication in strategic planning based on the BSC and KPI perspectives that have been determined.

5. CONCLUSIONS AND SUGGESTIONS

5.1 Conclusions

From the following result and discussion, we can take some conclusions as follows:

a. Determination of Development Strategy Concept

1) The results of environmental identification in the Eastern Region Material Maintenance Unit show 17 internal factors with 5 strength factors and 12 weakness factors and 14 external factors with 8 opportunity factors and 6 threat factors, which will be used as a reference for formulating priority strategies.

2) Determination of the development strategy concept using the SWOT Matrix Space with the intersection point of internal and external factors in the Matrix Space quadrant, namely point (-0.48, 0.32) located in quadrant II. Quadrant II is identical to the active stability strategy quadrant, namely an active strategy to take advantage of opportunities by minimizing weaknesses, in order to improve weaknesses into strengths. The strategy concept in quadrant II used is the Weakness-Opportunity (W-O) strategy.

b. Formulation of Strategic Objectives

The SWOT analysis process resulted in the concept of W-O (Weakness-Opportunity) strategy with seven alternative priority strategies. The result of the weighting of the best alternative strategies is WO1, namely Validation of the Organization and Procedures (Orgaspros) of the Eastern Region Material Maintenance Unit by utilizing the Presidential Policy, Ministry of Defense and Chief of Naval Staff which regulates material maintenance and development of TNI strength to become the world's maritime axis.

The strategic objectives to be achieved include the following:

- 1) Program planning and preparation of the Eastern Region Material Maintenance Unit Outline Design (RGB).
- 2) Determination of the authority, main tasks and responsibilities of the material maintenance development function to organize Harmen and Alutsista Depot activities.
- 3) Determination of technical instructions for implementing the material maintenance development function to organize Harmen and Alutsista Depot activities of the Indonesian Navy.
- 4) Determination of regulations for the procedures for the SPT Alutsista of the Indonesian Navy.
- 5) Determination of the scope of work that focuses on the maintenance of TNI AL materials and defense equipment,
- 6) Determination of TNI Perpang and Kasal Regulation as a legal umbrella related to the authority, main tasks and responsibilities of the material maintenance development function to organize Harmen and Depo activities in the efforts to Validate the Eastern Region Material Maintenance Unit Organization and Modernization of Defense Equipment,
- 7) Determination of Presidential regulations and legislation related to the validation of the Eastern Region Material Maintenance Unit organization.
- 8) Additional budget support for the maintenance of TNI AL defense equipment,

9) Additional budget support to improve the ability of material maintenance facilities and infrastructure to be able to independently carry out TNI AL defense equipment maintenance activities.

c. Determination of Key Performance Indicators

- 1) Based on discussions and Q&A with Experts or respondents, resulting in 22 strategic targets divided into 4 Balance Score Card (BSC) perspectives, namely financial, internal business, customer and learning and growth with identification of the determination of Key Performance Indicators (KPI) from each strategic target.

- 2) In Strategy Mapping, Internal Business Perspective as the main foundation perspective with the best strategic target, namely WO1, followed by Financial Perspective, Learning and Growth Perspective and finally Customer Perspective.

5.2 Suggestions

Based on the conclusions above, the author can provide suggestions and inputs as follows:

a. The next research can implement the determination of the vision and mission, main tasks, and job analysis of the Eastern Region Material Maintenance Unit organization.

b. Maximizing the Kasal Policy that regulates the maintenance and care of the TNI AL's defense equipment and synchronizing the development of strength with Organizational Validation and Modernization of Defense Equipment, Government Policy in realizing the world's maritime axis and the Policy of the Indonesian Ministry of Defense in developing TNI strength, so that it can be a means in the formation of the Eastern Region Material Maintenance Unit.

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