

## ANALYSIS OF THE MAINTENANCE SYSTEM OF WARSHIP BASED ON ISO 9000: 2015

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### ABSTRACT

*Today's Organizational Development is intensively carried out by all layers, both Profit and Non-Profit Organizations even in the Military world. The Military World will continue to improve in its Organization because of the demands of the development of the Main Tool system owned. Their Combat Equipment has undergone a lot of renewal and moderation. For this reason, a good Maintenance system effort is based on the ISO 9000: 2015 quality management system. Therefore, an analysis of strengths, weaknesses, opportunities, and obstacles is needed so that a quality management system that is in accordance with existing standards and rules can be developed. The purpose of writing is to formulate a SWOT Analysis integrated with 7 principles of the ISO 9000: 2015 quality management system in Combat Maintenance Maintenance Systems in a country. The research method used is descriptive qualitative, where data is collected through observation and interviews with decision-makers in an organization or company.*

**Keywords:** Organizational Benefits, Non Profit, Military, SWOT, ISO 9000: 2015.

### 1. INTRODUCTION.

In a combat base that is owned by a country will continue to increase development in terms of budget or politics, for any changes in an organization which will improve the organization under it. The meaning of the sea for the nation has four strategic meanings, namely: 1) As a natural resource and national economic media; 2) as a means of unifying the nation; 3) as a defense media; 4) as a communication media. Waters are a strategic element for commercial activities, such as fishing, laying submarine cables and pipelines, exploiting oil and gas and conducting scientific research. Faced with the above problems, it is necessary to continue to devise a strategy for developing a country's naval combat maintenance and repair facilities, this writing offers a planning development strategy that can help improve existing capabilities, at least able to carry out standardized maintenance and repair services.

existing, namely ISO 9000: 2015 standardization. To support this paper the author has taken several sources and literature to support this research, among others; *Total Quality Management* (Gaspers, 2008), *Impact of using certifications ISO 9000* (Chatzoglou, P., Chatzoudes, D., & Kipraios, N, 2015) *Preparing for the next 25 years of quality management standart* (Croft, 2012), *Integrated management systems assesment* (Domingues, P., Sampaio, P., & Arezes, P.M., 2016), *From Quality gurus and TQM to ISO 9001:2015: a review of several Quality paths* (Fonseca, 2015), *TQM as competitive advantage: A review and empirical study* (Powell, 1995), *a questionable reform. What should the implementing organizations understand and do?* (Juhani Anttila, Kari Jussila, 2017), *Time, speed and agility in QMS implementation* (El-Meligy, O., & Anttila, J. , 2008), *repositioning the quality profession* (Feary, S., & Armstrong, D., 2015), *Marketing Strategy and Management*

(Baker, 2000), Analytical Network Process in the Framework of SWOT Analysis for Strategic Decision Making (Case Study: Technical Faculty in Bor, University of Belgrade, Serbia) (Živković et al., 2015), An Overview of Strategic Management: An Analysis of the Concepts and the Importance of Strategic Management (Athapaththu, 2016), Maritime Strategy and the Balance of Power (Hattendorf and Jordan, 1989), I'Swot Model For the Formulation of Regional Leading Agro-Industry Development Strategies in North Sulawesi (Mirah, 2004), The Influence of Sea Power Upon History (Mahan, 1890), Evaluating tourism potential: A SWOT analysis of the Western Negev (Collins-Kreiner and Wall, 2007), SWOT Planning (Hill and Westbrook, 1997), Strategy Map for Hospital Management: Perspectives and Priorities (Niemić, 2016), SWOT Analysis Technique for Dissecting Business Cases (Rangkuti, 2003), Variations in Strategy Perception among Business and Military Managers (Özleblebici, Pinto and Antonio, 2015), China's strategy in the Middle East (The Silk Road Project) (Al-Rawashdeh and Al-Qatatsheh, 2017), Usulan Perencanaan Strategis Divisi Penjualan dengan Metode Analisa SWOT dan AHP (Studi Kasus: P.T. Telekomunikasi Indonesia Divisi Telkom Timur Witel Suramadu) (Cahyaningrum and Rukmi, 2014), Integrating AHP, SWOT and QSPM in Strategic Planning an Application to College of Business Administration in Saudi Arabia (Malik, Al-Khatani and Naushad, 2013), Factors that influence the efficiency of beef and dairy cattle recording system in Kenya: A SWOT - AHP analysis (Wasike et al., 2010)

This writing aims to provide advice and input in planning the development of an organization using the SWOT analysis method coupled with Standardization, which has been widely used in various companies/organizations in the world so that the War Ship maintenance system

is more optimal. Standardization referred to is the ISO 9000: 2015 Quality Management System

This paper is organized as follows Part 2 reviews the theoretical foundation used, namely Swot Analysis, Analytic Hierarchy Process, and Quality Management System. Part 3 Results And Discussion, Finally, in section 4 Of the Conclusion Of This paper.

## 2. MATERIAL AND METHODOLOGY.

### 2.1. Swot Analysis.

The SWOT analysis is the most common technique that can be used to analyze strategic cases (Terry Hill, Roy Westbrook, 1997), SWOT is a tool that is often used to analyze internal and external environments to achieve systematic approaches and support for decision situations (Wheelen and Hunger, 1995). SWOT is an acronym of strength (S), weakness (W), opportunity (O) and threat (T). The first two factors (strengths and weaknesses) are related to internal organizational factors, while opportunities and threats cover the broader context or environment in which the entity operates (Collins-Kreiner and Wall, 2007).

**Table 1.** Matrix Of Swot Analysis

INTERNAL/EXTERNAL FAKTOR	STRENGTH (S) (Maximal)	WEAKNESS (W) (Minimal)
OPPORTUNITIES (O) (maximal)	S-O Strategy (Maximal-Maximal)	W-T Strategy (Minimal-Minimal)
THREATS (T) (Minimal)	S-T Strategy (Maximal-Minimal)	W-O Strategy (Minimal-Maximal)

### 2.2. Quality Management System.

Quality Management System-QMS according to (Gaspers, 2008) that is a set of documented procedures and standard practices for management systems that meet the requirements of a process and product (goods or services) against the requirements

of certain requirements determined by customers and organizations.

### 2.3. Principle Of Quality Management System (ISO 9000:2015)

This standard can be used by organizations whether profit or non-profit/military functions as:

1. Uniformizing the structure of different quality management systems
2. Align the documentation of the structure of the clause of the existing standard
3. Using specific terminology of this Standard in the organization

The quality management system requirements specified in this Standard complement the requirements for products and services. This standard applies a process approach, which combines cycles “Plan – Do – Check – Action “ (PDCA) and “Risk Based Thinking”. The PDCA cycle helps organizations to ensure an adequate resource-making process, and opportunities to improve performance. Risk-based thinking helps organizations to determine factors that can cause quality management processes and systems to deviate from the planned results. In the ISO 9001: 2015 quality management system, there are 7 principles of the quality management system, namely:

- 1) Customer Focus. The primary focus of quality management is to meet customer requirements and to strive to exceed customer expectations.
- 2) Leadership. Leaders at all levels establish unity of purpose and direction and create conditions in which people are engaged in achieving the organization’s quality objectives.
- 3) Engagement of People. Competent, empowered and engaged people at all levels

throughout the organization are essential to enhance its capability to create and deliver value (involvement of people in ISO 900:2005 and ISO.

4) Process Approach. Consistent and predictable results are achieved more effectively and efficiently when activities are understood and managed as interrelated processes that function as a coherent system.

5) Improvement. Successful organizations have an ongoing focus on improvement.

6) Evidence Based Decision Making. Decisions based on the analysis and evaluation of data and information are more likely to produce desired results.

7) Relationship Management. For sustained success, an organization manages its relationships with interested parties, such as suppliers.

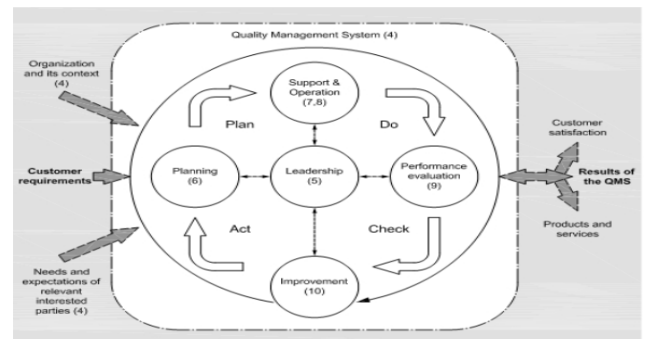


Fig. 1 Representation of the standard PDCA cyclic framework

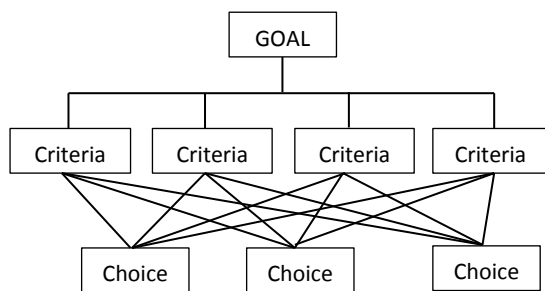
### 2.4. Metode Analytic Hierarchy Process (AHP)

Analytic Hierarchy Process (AHP) is a structured technique for managing and analyzing complex decisions based on mathematics and psychology that was first developed by Thomas L. Saaty, a mathematician who worked at the University of Pittsburgh in America in 1970.

Step By Step Of AHP :

1) Decomposition

It is a complex problem solving or divided into more detailed parts of the hierarchy where each element is interconnected, as seen in Figure 2. The hierarchy is structured to help the decision-making process in a system by noticing the decision elements involved



**Fig. 2** Hierarchy decision making model in the AHP method

2) Comparative Judgments

Perbandingan penilaian merupakan proses membandingkan secara berpasangan dari semua elemen yang ada dengan tujuan menghasilkan skala kepentingan relatif dari elemen. Hasilnya skala penilaian berupa angka. Perbandingan penilaian ini berpengaruh terhadap urutan prioritas dari elemen-elemennya. Skala kepentingan yang digunakan berupa skala 1 yang merupakan tingkat terendah (equal importance) hingga skala 9 berupa tingkatan tertinggi (extreme importance) seperti yang ditunjukkan pada Tabel 2.

**Table 2.** Table of relative scores according to Thomas L. Saaty

<i>Value of <math>a_{jk}</math></i>	<i>Interpretation</i>
1	<i><math>j</math> and <math>k</math> are equally important</i>
3	<i><math>j</math> is slightly more important than <math>k</math></i>
5	<i><math>j</math> is more important than <math>k</math></i>
7	<i><math>j</math> is strongly more important than <math>k</math></i>
9	<i><math>j</math> is absolutely more important than <math>k</math></i>

3) Logical Consistency

It is a complex problem solving or division into more detailed parts of the hierarchy where each element is interconnected, as seen in Figure 2. The hierarchy is structured to help the decision-making process in a system by noticing the decision elements involved. Consistency Index / CI is a measure of consistency of the criteria weight. If CI is zero (0), then the given weight is consistent. Consistency Ratio / CR. The Index ratio (RI) is a scale for measuring consistency ratios. The value of the index ratio is in Table 3.

**Table 3.** Values of the Random Index (RI) for small problems

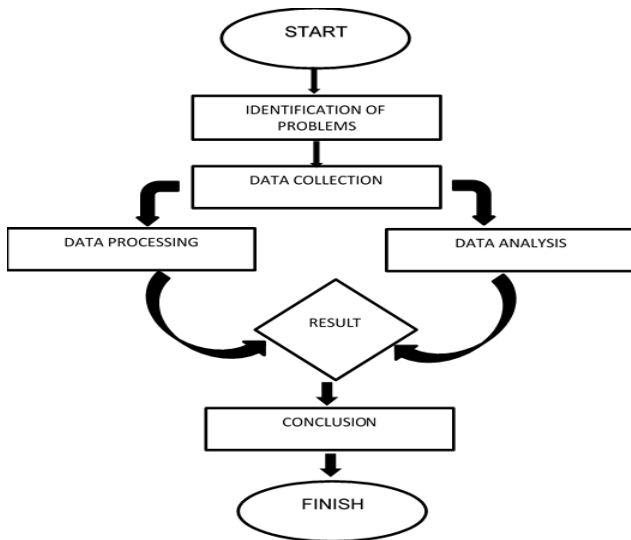
<i>m</i>	2	3	4	5	6	7	8	9	10
<i>RI</i>	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.51

$$CI = \frac{(\lambda maks - n)}{(n-1)}$$

**2.5. Method of Research**

The research method used is a qualitative descriptive method using SWOT analysis and integrated entities from the implementation of the ISO 9001: 2015 Quality Management System. The results of this combination will get some alternative strategies that will be selected in improving quality services that lead to customer satisfaction.

To solve the problems in the observed research, steps are needed and determined to describe the approach and problem model. The steps taken are:



**Fig. 3** Research Of Flow Chart

Hadiwardjo and Wibisono (Hadiwardjo, B. H., S.Wibisono, 1996) said, companies that run a quality management system tend to show the following characteristics:

- 1) There is a philosophy that prevention is better than detecting, correcting, and results.
- 2) Consistent communication in the process and between production, suppliers, and buyers;
- 3) Careful maintenance of documents and critical control efficiently;
- 4) Quality awareness of all employees; very high management trust.

### 3. RESULT AND DISCUSSION

In this section the author will try to make the concept of integration of SWOT analysis methods and 7 the main principles of the ISO 9000: 2015 quality management system so that it becomes a strategy concept to improve the maintenance system based on quality management to develop the organization that will be planned in the future.

The first step is to determine what aspects an organization has in accordance with the rules of the Swot Analysis Theory consisting of Strengths (S),

Weakness (W), Threats (T) and Opportunity (O) which will be presented in Table 4.

**Table 4.** Determination of Aspects of an Organization

INTERNAL FACTORS	STRENGTHS	WEAKNESSES
	S 1	W 1
	S 2	W 2
	S 3	W 3
	S 4	W 4
EXTERNAL FACTORS	S 5	W 5
OPPORTUNITY	SO	WO
O 1	[S1, O1]	[W1, O1]
O 2	[S2, O2]	[W2, O2]
O 3	[S3, O3]	[W3, O3]
O 4	[S4, O4]	[W4, O4]
O 5	[S5, O5]	[W5, O5]
THREATS	ST	WT
T 1	[S1, T1]	[W1, T1]
T 2	[S2, T2]	[W2, T2]
T 3	[S3, T3]	[W3, T3]
T 4	[S4, T4]	[W4, T4]
T 5	[S5, T5]	[W5, T5]

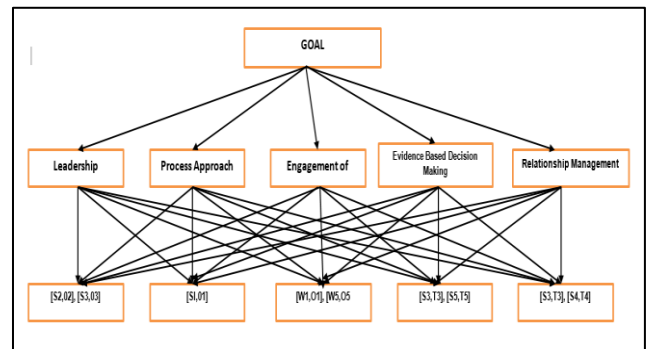
After getting a number of alternative strategies consisting of SO, WO, ST, and WT strategies. The next step is to put in place a number of strategies that have been arranged and there are links to 7 criteria or principles of the Quality Management System to be raised then weighted based selection using the AHP (Analytical Hierarchy Process) method which is representative according to the needs of the Organization with what is currently experienced. In table 5 is an example of the chosen strategy modeling concept:

**Table 5.** Integration of Swot Analysis and 7 Principles of ISO 9000: 2015 Quality Management System

	Selection Of Strategic			
	SO	WO	ST	WT
<b>Customer Focus</b>	[SI,01], [S3,03]	[W2,O2], [W5,O5]	[S3,T3]	[SI,01]
<b>Leadership</b>	[S2,02], [S3,03]	[W2,O2], [W1,O1]	[S5,T5]	[S3,03]
<b>Engagement of People</b>	[S4,04], [S5,05]	[W2,O2]	[S3,T3], [S5,T5]	[S2,02], [S3,03]
<b>Process Approach</b>	[SI,01]	[W3,O3], [W4,O4]	[S1,T1], [S2,T2]	[SI,01], [S4,04]
<b>Improvement</b>	[SI,01], [S5,05]	[W1,O1]	[S4,T4], [S5,T5]	[S1,01], [S3,03]
<b>Evidence Based Decision Making</b>	[S2,02], [S1,01]	[W4,O5]	[S3,T3], [S4,T4]	[S4,04], [S5,05]
<b>Relationship Management</b>	[S4,04], [S3,03]	[W1,O1], [W5,O5]	[S1,T1], [S5,T5]	[S2,02]

After getting the results of the tabulation of the strategy of combining Swot Analysis and the 7 Principles of the Quality Management System, it can be continued by carrying out a Discussion Forum for decision makers so that several alternatives can be raised for selection, which will be a strategy for the Organization to reach the Organization can meet ISO 9000: 2015 Standardization, there are at least 3 to 5 strategy choices that will be carried out weighting to bring out the best scoring value. There are several weighting methods that have developed at this time, the author uses the AHP weighting method because it is still adaptable and easy for most organizations or companies that are in the development stage. From the results of the Focus Group Discussion (FGD) the Decision Makers who are believed to hold an important role in an organization or company can be formulated for the selected strategies marked in red based on Table 3. Integration of Swot Analysis and 7 Principles of ISO 9000: 2015 Quality Management System for weighting using the AHP method. From the results of the table above, there are 5 criteria for selecting the results of the FGD, including; *Leadership*,

*Process Approach*, *Engagement of People*, *Evidence Based Decision Making*, *Relationship Management*. The next step is to carry out weighting to get the best strategy to be used as a strategy for the organization or company.



**Fig 4.** Weighting Strategy options Using the AHP method

#### 4. CONCLUSION.

Finally, based on the above formulation concept, it is hoped that it can improve the performance of an organization or company whether profit or non-profit, quality standardization can later be used in the military world in general. So that in developing an organization, especially in terms of service, is the main concern of a country's

military equipment, especially services for warship maintenance, the Quality Management System is the main thing to become a reference in combat equipment maintenance systems. With this, the authors hope that the development rate of the defense industry in the Asian region will continue to seek standardization orientation in terms of care to support the success of operations desired by a country.

## 5. ACKNOWLEDGEMENTS.

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