Contribution of Naval Competence and Spare Parts to KRI Readiness

Nazil Wibowo*, Melia Lestiani(iD), Maniah Maniah,
and Saptono Waskito

Master of Logistics Management Study Program,
University of Logistics and International Business, Indonesia
*nswibowo28@gmail.com

Abstract. The aim of this research was to examine and demonstrate the effects of OBS availability and soldier proficiency on KRI's preparedness for Pushidrosal mapping survey operations. Using SPSS software, a quantitative research methodology is used. According to the study's findings, the variable of OBS availability has a positive and significant impact on KRI Readiness in carrying out mapping survey operations, and the t-count value on the variable of soldier ability obtained was 4,427. This indicates that there is an influence of soldier ability on KRI in carrying out mapping survey operations, with the influence of soldier ability being partially 11.6%. Additionally, the f-count value on the variable of OBS availability and soldier ability obtained is 123,824; this indicates that both OBS availability and soldier ability have an impact on KRI concurrently when conducting Pushidrosal survey operations. The t-count value on the variable of OBS availability is 12,700, and the influence of OBS availability is partially 54%. The Indonesian Navy uses the study's findings as input in an attempt to expand OBS availability and ensure the seamless functioning of survey activities.

Keywords: Soldier Capability, On Board Spare Availability and KRI Readiness.

1   Introduction

As part of the KRI's combat preparedness, the system for supplying and equipment must be ready. Because the equipment and supply system could not work well without sufficient replacement parts, combat preparedness might be diminished if OBS are not available. The preparedness of the equipment and aircraft on board is greatly affected by the accessibility of replacement parts. Maintenance and repairs can be postponed if necessary components are in short supply [1]. The ship's operational readiness might be compromised due to inefficient supply and oversight of spare components. Several factors can affect a KRI's readiness, according to Pushidrosal's history. These include having enough high-quality on-board spare parts (OBS), being well-prepared to procure these parts, and having soldiers who are both fully prepared and understand the mission. Only then will a KRI be able to successfully complete the Pushidrosal mapping survey

operation. Whether or not KRI is prepared will determine how well the mapping survey goes.

In 2023, Marbun was one of many comparable but distinct studies that looked at how the organic scheduled maintenance system at KRI Makassar-590 was affected by factors including OBS distribution and staff competency. The necessity of distribution and personal competency is discussed, along with the issue of being operationally ready at all times when neither is present. It is critical to have sufficient spare components on hand to keep the ship running smoothly and for repairs and maintenance. Study by Bagus Subrojo (2023) on the effect of maintenance management and liquid logistics support on KRI operations readiness in the Koarmada region. The purpose of this research is to determine how the Republic of Indonesia Warship's (KRI) operational preparedness in the Koarmada zone is affected by liquid logistics assistance on an individual basis. This investigation was carried out utilizing quantitative methods [2]. Also, Sonny Hermawan and Nur Khabibi were the ones who really ran the show in this research (2022) [3]. In what ways may the Mentigi Pier Faslabuh's infrastructure and human resources affect the preparedness of KRI operations in the Lantamal IV region? The purpose of this research is to determine how the Mentigi Pier Faslabuh's infrastructure, staff skills, and facilities affect the preparedness of KRI operations in the Lantamal IV area.

In order to determine how prepared KRI is to conduct Pushidrosal mapping survey operations, this study will examine the following: how available OBS is to KRI; how soldier capabilities affect KRI's readiness to conduct Pushidrosal mapping survey operations; and how both OBS availability and soldier capabilities interact with one another to affect KRI's readiness to conduct Pushidrosal mapping survey operations. Data collected is primarily numerical or quantitative in nature, and statistical analysis is the mainstay of this quantitative approach.

Findings from this research indicate a correlation between KRI's preparedness to conduct Pushidrosal surveys and the availability of OBS, the availability of OBS and the ability of troops concurrently impact KRI's capacity to conduct Pushidrosal survey operations, and the ability of soldiers themselves impacts KRI's capacity to conduct such operations.

In cases when this study's findings are applicable, Logistics management is aided by the presence of a well-planned OBS, which guarantees that the KRI always has the required components on hand when needed. Here, it's critical to set aside enough money to buy and maintain the OBS so the KRI may continue to be prepared to conduct the Pushidrosal survey.

2   Literature Review

In the context of this research, the novelty elements presented through this research are very significant. The focus on the availability of OBS and the capabilities of soldiers are critical aspects that determine the operational readiness of KRI in carrying out important tasks such as Pushidrosal mapping survey operations. By understanding the dynamics between the availability of OBS and the capabilities of soldiers, this research

contributes to the development of strategies to improve the readiness of KRI in every mission. This research is expected to help policy makers create more efficient military training programs and logistics management.

The condition of a facility (goods, manpower, capital or budget) that is ready to be used or operated within a certain period of time is called availability [4]. In the context of inventory management, availability refers to the availability of parts, materials, or resources needed to perform operations or meet specific needs. Good availability can ensure smooth processes and efficiency in various areas. Abilityisskill or ability to do something. Ability iscognitive ability to perform job functions. It can be concluded that ability is a person's ability to do various types of work [5]. A person's ability distinguishes him from ordinary or average people [6]. Readiness is a condition that shows who is ready to do a task or job. Readiness can be seen from several perspectives, such as physical condition, psychological and principles of readiness. Readiness is a condition or state, be it a person, equipment, or organization that has the preparation and capacity to respond appropriately and effectively to situations or events that may occur [7].

In this study, there are several aspects that are worth examining, namely:the number of OBS available is not sufficient to support the readiness of KRI in carrying out Pushidrosal mapping survey operations, the distribution of OBS given to ships is not optimal and not timely in accommodating the required requests, the readiness (skills, abilities and understanding) of soldiers in carrying out emergency repairs to aircraft and equipment related to Pushidrosal survey operations is not adequate/still lacking,and the KRI performance/operational monitoring and evaluation system (JOP/JOG) has not been implemented properly in carrying out mapping surveys.

This study focuses on the importance of OBS and legal skills in improving the operational performance of KRI, especially in Pushidrosal surveillance operations. Understanding the relationship between these aspects contributes to the development of strategies to improve KRI performance in all aspects. Key findings can be used to develop more effective training programs and logistics management. Availability is the skill or ability to carry out a task, while ability is the cognitive ability to carry out a particular task. Readiness is a condition or ability that affects a person's ability to carry out a task. This study identified several problems, such as inadequate OBS support, insufficient OBS distribution, lack of legal skills in improving performance, and inadequate KRI monitoring and evaluation systems in carrying out effective surveillance.

3   Methodology

The primary goals of quantitative research are the collection and statistical analysis of numerical or quantitative data. One goal of using this research approach is to provide academics a general idea of how to conduct research in order to address issues. Furthermore, correlation tests are used to ascertain the existence of a link between the variables, and path analysis is used to quantify the impact of endogenous factors on exogenous variables [8]. The 200-person population of this research consists of Pushidrosal employees at KRI and Dismatbek. Arikunto (2020) states that the people is the focus

of the research. When every aspect of the research's scope is examined, it is called a population study [9]. Key characteristics included in this research are age, level of education, and duration of service. The months of June through August 2024 were used for this research. The data for this research came from a combination of observation, questionnaires, and reviews of relevant literature. The data processing phase follows the data collection phase. Making the data more relevant is the goal of this data processing [10].

One hundred and twenty Pushidrosal service members from KRI and Dismatbek make up the study's population, which aims to determine the impact of OBS availability and soldier preparedness on KRI readiness to conduct Pushidrosal survey and mapping operations. This research makes use of the following characteristics: duration of service, education level, and age. This is the table displaying the responder characteristics:

Table 1. Table captions should be placed above the tables.

Respondent Characteristics	Frecuency
Ages	20-25 years = 19
	26-30 years = 28
	31-35 years = 87
	36-40 years = 58
	> 40 years = 8
Education	Junior High School = 2
	High School = 136
	S1 = 42
	S2 = 20
Working period	0-5 years = 17
	6-15 years = 64
	16-25 years = 88
	>25 years = 31

Source: Processed by Researches, 2025

Data classification was the next step after collecting surveys from respondents. Data validity testing is an integral part of processing. When testing the validity of data, two main categories of procedures are employed: reliability tests and validity tests. Classical assumption testing including nnormality, heteroscedasticity, multicollinearity, and autocorrelation follows the data validity test. Following this, we do a correlation analysis test to see how the two variables are related [11]. Multiple linear regression, determinant coefficient, beta, t, and f tests are all part of correlation analysis. Following processing, SPSS version 27 was used for data analysis

4 Discussion

4.1 Validity Test Results

OBS Availability Validity Test Results (X1). The researcher conducted a pilot test. The instrument used in collecting data from 30 respondents for the OBS (X1) availability variable consisted of 10 statements. The results of the Pilot test are as follows:

Table 2. Results of Pilot Test Validity of OBS Availability (X1).

Variable	Question	r Calculate	r Table	Information
OBS Availability (X1)	X1.1	0.903	0.361	Valid
	X1.2	0.558	0.361	Valid
	X1.3	0.815	0.361	Valid
	X1.4	0.878	0.361	Valid
	X1.5	0.723	0.361	Valid
	X1.6	0.752	0.361	Valid
	X1.7	0.785	0.361	Valid
	X1.8	0.863	0.361	Valid
	X1.9	0.773	0.361	Valid
	X1.10	0.875	0.361	Valid

Source: Data Processed with SPSS 27.

After comparing the estimated r value to the r table value (0.361), it can be concluded that all statement items in the OBS availability variable are legitimate, according to the data in the table above. It follows that the assertions included in the OBS availability variable are legitimate and appropriate for further examination.

Soldier Ability Validity Test Results (X2). The researcher conducted a Pilot test. The instrument used in collecting data from 30 respondents for the soldier's ability variable (X2) was 10 statements. The results of the Pilot test are as follows:

Table 3. Results of pilot test validity of soldier ability (X2).

Variable	Question	r Calculate	r Table	Information
Soldier Ability (X2)	X2.1	0.903	0.361	Valid
	X2.2	0.947	0.361	Valid
	X2.3	0.820	0.361	Valid
	X2.4	0.707	0.361	Valid
	X2.5	0.832	0.361	Valid
	X2.6	0.891	0.361	Valid
	X2.7	0.780	0.361	Valid
	X2.8	0.868	0.361	Valid
	X2.9	0.780	0.361	Valid
	X2.10	0.716	0.361	Valid

Source: Data Processed with SPSS 27.

All claims pertaining to the variables in the logistics information system are deemed genuine, as stated in the table above. All statements about the Soldier Ability variable may be utilized for the following procedure as the computed r-value is larger than the table r-value (rtable = 0.361).

Validity Test Results Validity of KRI Readiness (Y). Researchers conducted a pilot test. The instrument used to collect data from 30 respondents for the variables readiness of KRI to carry out operations (Y) as many as 10 statements. The results of the Pilot test are as follows:

Table 4. Table of Pilot test results Validity of KRI Readiness to Implement Operations (Y)

Variable	Question	r Calculate	r Table	Information
KRI Readiness (Y)	Y1	0.761	0.361	Valid
	Y2	0.785	0.361	Valid
	Y3	0.726	0.361	Valid
	Y4	0.813	0.361	Valid
	Y5	0.821	0.361	Valid
	Y6	0.838	0.361	Valid
	Y7	0.734	0.361	Valid
	Y8	0.771	0.361	Valid
	Y9	0.816	0.361	Valid
	Y10	0.774	0.361	Valid

Source: Data Processed with SPSS 27

The assertions in the KRI readiness variable regarding operations are all deemed legitimate according to the table above, since the r-count value is higher than the r-table value (r-table = 0.361). All things considered, the assertions stored in the variable are legitimate and can go on to the next level of examination.

4.2   Validity Test Results

A measuring instrument's reliability may be defined as its accuracy, precision, and consistency while measuring a phenomena. A reliable instrument is one whose measurement findings remain relatively constant throughout a variety of testing conditions and timeframes [9].

Table 5. Reliability Test Results of OBS Availability (X1)

Reliability Statistics	
Cronbach's Alpha	N of Items
.934	10

Source: Data Processed with SPSS 27.

The computed alpha value (α) is 0.934, which is more than the cutoff of 0.60, according to the findings. Based on the dependability of each statement item in the OBS availability variable, it can be determined that they are all appropriate for this research.

Table 6. Reliability Test Results of Soldier Ability (X2)

Reliability Statistics	
Cronbach's Alpha	N of Items
.946	10

Source: Data Processed with SPSS 27.

The components of the Soldier Ability statement may be utilized for study since the alpha value (α) = 0.950 was achieved, which is larger than 0.60 (0.950 > 0.60).

Table 7: Results of the Reliability Test of KRI Readiness (Y)

Reliability Statistics	
Cronbach's Alpha	N of Items
.929	10

Source: Data Processed with SPSS 27.

The alpha (α) value of 0.929 was derived from the computations conducted using the SPSS 29 for Windows application. Statement items in the KRI readiness variable for carrying out activities have a fair degree of dependability and may be utilized in this research since this value is greater than the minimal limit of 0.60 (0.929 > 0.60).
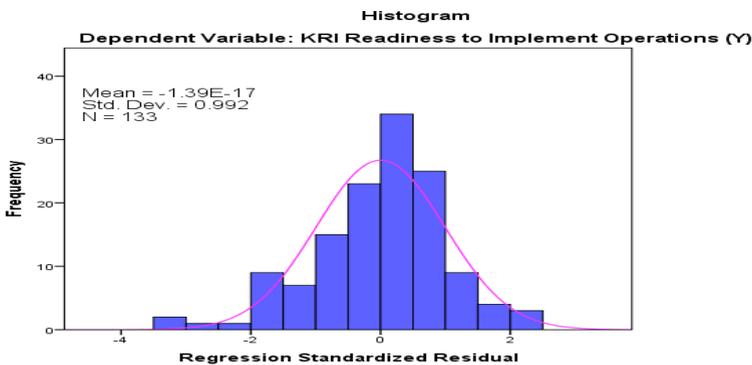
4.3   Normality Test Results

The test aims to ensure that the data meet the important assumptions in linear regression analysis [12]. Some of the classic assumptions tested include:

Table 8. Results of the Normality Test.

One-Sample Kolmogorov-Smirnov Test		Unstandardized Residual
N		133
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	5.09936676
Most Extreme Differences	Absolute	.090
	Positive	.040
	Negative	-.090
Test Statistic		.090
Exact Sig. (2-tailed)		.215
a. Test distribution is Normal.		
b. Calculated from data.		

Source: Data processed with SPSS 27.

A normal curve is necessary for Kolmogorov-Smirnov based normality analysis when the Asymp. Sig. value is more than 0.05. If the Asymp.Sig value is greater than 0.05, then the data follows a normal distribution. The Normal P-Plot and Histogram of the Regression The study's standardized residual graph displays are:

Fig. 1. Histogram Normality Test.
Source: Data processed with SPSS 27.

In normality testing using histograms, a graph is categorized as normal if the data distribution resembles a bell-shaped pattern without a tendency to the left or right. In this study, the histogram graph displayed shows a bell pattern and does not display a slope to one side, so it can be concluded that the data is normally distributed.

Fig. 2. P-Plot Normality Test.
Source: Data processed with SPSS 27

Additionally, as can be seen from the display above, the data points are distributed around the diagonal line and their distribution follows the diagonal line's direction in the P-Plot test. Therefore, we say that the aforementioned variables all follow a normal distribution.

4.4   Heteroscedasticity Test Results

The heteroscedasticity test, which seeks to determine whether the residual variance in the used regression model differs across data, is the next step in evaluating the classical assumptions. As per Wibisono, the Glejser test method is used to conduct the heteroscedasticity test; specifically, the independent variable is regressed against the absolute value of the residual.

Table 9. Heteroscedasticity test results.

Correlations			
			Unstandardized Residual
Spearman's rho	OBS Availability (X1)	Correlation Coefficient	.069
		Sig. (2-tailed)	.430
		N	133
	Soldier abilities (x2)	Correlation Coefficient	.066
		Sig. (2-tailed)	.452
		N	133

Source : Data processed with SPSS 27

A statistically insignificant association is seen from the results shown above. Because Sig. (2-tailed) is larger than 0.05, this is evident. Thus, the absence of heteroscedasticity in the regression model may be inferred.

Fig. 3. Scatterplot Heteroskedastisitas Test.
Source : Data processed with SPSS 27.

4.5   Multicollinearity Test Results

Multicollinearity occurs when some or all of the independent variables have a high degree of correlation. To detect the presence of multicollinearity, one of the commonly used methods is Variance Inflation Factors (VIF).

Table 10. Multicollinearity Test Results

Coefficients[a]			
		Collinearity Statistics	
Type		Tolerance	VIF
1	OBS Availability (X1)	.885	1.130
	Soldier abilities (x2)	.885	1.130
a. Dependent Variable: Readiness of KRI to carry out operations (Y)			

Source : Data processed with SPSS 27.

According to the results, the data does not show any signs of multicollinearity as the VIF is less than 10 and the tolerance is more than 0.1.

4.6   Hypothesis Test Results

Statistical procedures and techniques are used in hypothesis testing to ascertain the ac-ceptability or rejection of the study's suggested hypothesis using sample data [8].

Partial Test. A partial test, often known as a t test, is a statistical tool that may be used to examine the impact of a single independent variable on the dependent variable inside a regression model [13].

Table 11. Test results.

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Type		B	Std. Error	Beta	t	Sig.
1	(Constant)	-2.931	2.259		-1.297	.197
	OBS Availability (X1)	.790	.062	.695	12.700	.000
	Soldier abilities (x2)	.241	.055	.242	4.427	.000
a. Dependent Variable: Readiness of KRI to carry out operations (Y)						

Source : Data processed with SPSS 27.

Based on the table above, it can be concluded that:
1.   The Influence of OBS Availability (X1) on KRI Readiness to Carry Out Operations (Y)
The Variable X1 has a computed t-value that is greater than the t-table value in the analysis. The null hypothesis is rejected since the estimated t value of 12.700 is larger than the t table value of 1.978. This indicates that the Readiness of KRI to carry out activities is somewhat impacted by the Availability of OBS (X1).
2.   The Influence of Soldier Capabilities (X2) on the Readiness of KRI to Carry Out Operations (Y)

Additionally, the study showed that X2's t-value is greater than the t-table value. The null hypothesis is rejected since the t-value (4.427) is greater than the t-table value (1.984). It follows that Soldier Ability (X2) significantly impacts KRI's Readiness to Conduct Operations, at least to a certain extent. How Operational Readiness of KRI Is Influenced by OBS Availability (X1) (Y).

In linear regression analysis, the f test is a statistical tool for examining the combined effect of the independent and dependent variables [12]. Overall, the dependent variable may be explained by the regression model if the F value is significant.

Table 12. Test results f.

ANOVA[a]

Type	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	6538.781	2	3269.390	123.824	.000b
Residual	3432.467	130	26.404		
Total	9971.248	132			

a. Dependent Variable: Readiness of KRI to carry out operations (Y)

b. Predictors: (Constant), Soldier Ability (X2), OBS Availability (X1)

Source : Data processed with SPSS 27.

The computed F-value of 123.824, as shown in the table above, is higher than the F-table value of 3.07, as shown in the table. This means that both the availability of OBS (X1) and the capability of the soldiers (X2) significantly impact the readiness of KRI to carry out operations (Y), thereby rejecting the null hypothesis.

Correlation Coefficient (R) and Determination Coefficient (R2)

One way to see out how linearly related two variables are to look at their correlation coefficient [14]. A linear connection between variables is all that is shown by correlation; it does not imply a cause-and-effect relationship.

Table 13. Correlation coefficients X1 and X2 relative to Y.

Model Summary[b]

Type	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.810a	.656	.650	5.13844

a. Predictors: (Constant), Soldier Ability (X2), OBS Availability (X1)

b. Dependent Variable: Readiness of KRI to carry out operations (Y)

Source : Data processed with SPSS 27

The SPSS 27 results show a correlation coefficient (R) of 0.810, which is equal to 81%. According to this chart, the readiness of KRI to carry out operations (Y) is strongly correlated with the availability of OBS (X1) and soldier capability (X2). To

find out how much of an effect the independent variable has on the dependent variable, statisticians utilize the coefficient of determination (R^2). The data processing findings reveal a R^2 value of 0.656, or 65.6%, suggesting that additional factors beyond the scope of this research impact the remaining 34.4%.

5   Conclusion and Recommendations

The conclusion from the analysis results is that there is an influence of the availability of On Board Spare (OBS) on the readiness of KRI in carrying out Pushidrosal survey operations, tThere is an influence of the soldier's ability on the readiness of the KRI in carrying out the Pushidrosal survey operation, and the influence of the availability of OBS and the capabilities of the soldiers on KRI in carrying out Pushidrosal survey operations.

The results of this study are used as input for the Indonesian Navy in increasing the availability of OBS to maintain the smooth running of the Pushidrosal survey operation and trying to improve the capabilities of personnel, one of which is by increasing training in units, honing the skills of personnel to reduce difficulties in carrying out tasks and work ability in conditions where a personnel feels capable when completing the assigned task, and trying to improve the readiness of KRI in carrying out Pushidrosal survey operations by optimizing the availability of OBS and soldier capabilities.

References

1. Prayitno, M.E.: Peningkatan kesiapan kapal perang Republik Indonesia (KRI) Satuan Lintas Laut Militer Jakarta untuk mendukung angkutan laut militer. Jurnal Pertahanan & Bela Negara. **12**(1), 1-15 (2022).
2. Subrojo, B.: Pengaruh Dukungan Logistik Cair Dan Maintenance Management Terhadap Kesiapan Operasi KRI Di Wilayah Koarmada. Journal of Industrial Engineering & Management Research, **4**(4), 69-76, (2023).
3. Hermawan, S., Khabibi, N.: Pengaruh Kemampuan Personil dan Sarana Prasarana Faslabuh Dermaga Mentigi terhadap Kesiapan Operasi KRI di Wilayah Lantamal IV. Jurnal Perikanan Dan Kelautan, **27**(1), 88-93, (2022).
4. Nisa, N.R.F, https://media.neliti.com/media/publications/103378-ID-ketersediaan-koleksi-buku-ilmu-perpustak.pdf, last accessed 2022/04/21.
5. Gordon, R.L.: The measurement of human performance. Wadsworth Publishing, California, (1982).

6. Sedarmayanti.: Good Governance (Kepemerintahan Yang Baik) Dalam Rangka Otonomi Daearh Upaya Membangun Organisasi Efektif Dan Efisien Mellui Restrukturisasi Dan Pemberdayaan. Mandar Maju, Bandung (2003).

7. Maulana, M.I.: E-Thesis UIN Malang, http://etheses.uin-malang.ac.id, last accessed 2025/03/01.

8. Sugiyono.: Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif Dan R&D. Alfabeta. Bandung (2016).

9. Arikunto, S.: Prosedur Penelitian Suatu Pendekatan Praktik. Rineka Cipta, Jakarta (2020).

10. Creswell, J. W., Lazuardi, A. L., Qudsy, S. Z.: *Penelitian kualitatif & desain riset: memilih diantara lima pendekatan*. Pustaka Pelajar, Yogyakarta (2015).

11. Sujarweni, W.: Metodologi penelitian: Lengkap, praktis, dan mudah dipahami. Pustaka Baru Press, Yogyakarta (2014).

12. Ghozali, I.: Aplikasi analisis multivariete dengan program IBM SPSS 23. Universitas Diponegoro Press, Semarang, (2018).

13. Ghozali, I.: Aplikasi analisis multivariete dengan program IBM SPSS 26 Edisi 10. Universitas Diponegoro Press, Semarang, (2021).

14. Gujarati, D. N.: Basic Econometrics (4th ed.). McGraw-Hill, New York (2004).