

## Patrol Ship Management Efficiency Through Integrated Information System At The Class Ii Bitung Sea and Coast Guard Base

Joanda Arya Kusuma<sup>1</sup>; Evi E. Masengi<sup>2</sup>; Fitri H. Mamonto<sup>3</sup>

<sup>1,2,3</sup>Universitas Negeri Manado, Indonesia

Email: [joandaaryakusuma@gmail.com](mailto:joandaaryakusuma@gmail.com)

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#### Corresponding Email:

[joandaaryakusuma@gmail.com](mailto:joandaaryakusuma@gmail.com)

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### ABSTRACT

To find out, identify and analyze the efficiency of operational data management of patrol vessels through an integrated information system at the Bitung Class II Coast Guard Base. In accordance with the problems that the researcher explains, the type of research used by the researcher is descriptive with a qualitative approach. The purpose of this research is to observe and find out what is to be researched. Based on the discussion above, it can be concluded that the efficiency of operational data management of patrol boats at PPLP Class II Bitung is not optimal, this is greatly influenced by the harmonious integration between procedures, resources, and information systems, namely: Procedures, although there are standard operational guidelines as reflected in the implementation of SIM KPLP, these procedures do not fully support real-time reporting and data processing. The technical reporting process of the ship is only carried out once a month, while other workflows such as logistics and administration still use a manual approach. This causes delays in decision making and lack of integration between units which has the potential to hinder the effectiveness and efficiency of patrol boat operations.

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### INTRODUCTION

Given the various problems that exist, a solution is needed that can increase efficiency in patrol boat management, one of which is by implementing an integrated information system. This system allows for more accurate operational data management, increased effectiveness of coordination between units, and reduced risk of human error in ship management. Implementation of an integrated information system can also provide long-term benefits, such as increased accuracy in fleet monitoring, optimization of resource use, and improvements in ship maintenance and repair systems. Thus, the development of this system is not only a demand for modernization, but also a strategic step in improving national maritime security.

Therefore, it is interesting for researchers to be able to conduct more in-depth research with the title "Efficiency of Patrol Boat Management through an Integrated Information System at the Class II Bitung Sea and Coast Guard Base".

To find out, identify and analyze the efficiency of operational data management of patrol boats through an integrated information system at the Bitung Class II Sea and Coast Guard Base. Add scientific references in the field of public administration, especially related to management efficiency and integrated information systems. As well as contributing to the development of management theory, management and digital management. Provide input for the Bitung Class II Sea and Coast Guard Base to overcome the challenges of patrol boat management. As well as providing strategic recommendations for optimizing the efficiency of operational data management of ships. Etymologically, the word management comes from Old French *ménagement*, which means the art of implementing and managing. While in terms of terminology, experts define management in various ways, including: Arifudin et al. (2023) state that management is a unique process consisting of planning, organizing, mobilizing and controlling actions carried out to determine and achieve goals through the utilization of human resources and other resources. Bedjo Siswanto (2021) states that management is the process of planning, organizing, directing and controlling resources to achieve organizational goals effectively and efficiently.

Terry (2020) states that Management is the achievement of predetermined goals through or together with the efforts of others. Management is also a process or framework, which involves guiding or directing a group of people towards organizational goals or real intentions. This includes knowing what to do, determining how to do it, understanding how they should do it and measuring the effectiveness of the efforts that have been made.

From the several definitions mentioned above, it can be concluded that management is an effort carried out together to determine and achieve organizational goals by implementing the functions of planning, organizing, implementing (actuating), and supervising (controlling). Management is an activity; its implementation is called managing and the person who does it is called a manager. Management is needed at least to achieve goals, maintain balance between conflicting goals, and to achieve efficiency and effectiveness. Management consists of various elements, namely man, money, method, machine, market, material and information. 1) Man: Human resources; 2) Money: Money needed to achieve goals; 3) Method: Way or system to achieve goals; 4) Machine: Machine or tool for production; 5) Material: Materials needed in activities; 6) Market: Market or place to throw production results; 7) Information

## METHOD

In accordance with the problems explained by the researcher, the type of research used by the researcher is descriptive with a qualitative approach. The purpose of this study is to observe and find out what is to be studied. Kirk and Miller in Moleong (2018) define that qualitative research is a particular tradition in social science that fundamentally depends on observations of humans both in their area and in their terminology.

Meanwhile, according to Bogdan and Taylor in Moleong (2018) defines qualitative methodology as a research procedure that produces descriptive data in the form of written or spoken words from people and observable behavior. In other words,

a qualitative approach is an instrument used by relying on observations of the subjects and objects being studied which produces descriptive data in the form of written or spoken words from people and observed behavior.

The purpose of descriptive research is to describe or create a systematic, factual, and accurate picture of the facts and relationships between the phenomena studied and observed. The researcher will analyze, describe how the real conditions in the field are regarding the efficiency of patrol boat management at the Bitung Class II Coast Guard Base and relate it to the theories underlying this research so that answers to the problems discussed can be obtained.

The focus of the research arises as a problem obtained in the research. Moleong (2019) stated that qualitative research requires that there be limitations in the research based on the focus that arises as a problem in the research. Due to the breadth of the existing problems, researchers try to limit the study so that they can focus the research.

This research will focus on the efficiency of operational management of patrol boats through an integrated information system at the Class II Bitung Sea and Coast Guard Base.

Focus on the Problem	Sub Focus	Description
Efficiency of Patrol Boat Operational Data Management through an Integrated Information System at the Bitung Class II Coast Guard Base	Procedure	Operational procedures refer to the work procedures carried out by officers in recording, monitoring, and reporting patrol boat activities. This sub-focus will examine the speed and accuracy of the process implementation, as well as the consistency of the implementation of SOPs (Standard Operating Procedures) in the field.
	Resource	The resources in question include both human resources (personnel) and supporting technological infrastructure.
	Information Systems	refers to a series of hardware, software, procedures, and people designed to collect, process, store, and distribute information to support decision making, coordination, control, and analysis in an organization.

This research was conducted at the Class II Bitung Coast and Sea Guard Base. This location was chosen based on considerations to obtain accurate data and agreement to find out how data management on the patrol ship is related to public management.

According to Moleong (2018) research instruments are as data collection tools such as tests in quantitative research. The position of the researcher is also as a planner, implementer of data collection, analysis, data interpreter, and ultimately he becomes the reporter of the results of his research. The definition of an instrument or research tool here is right because it is everything from the entire research process. Therefore, the research instrument is the researcher himself where in the data collection process it is supported by other instruments such as interview guidelines, stationery and

notebooks as a means of summarizing each data obtained and the use of a camera as a documentation tool and a cellphone record to record the interview results.

This research was conducted at the Class II Bitung Coast and Sea Guard Base. This location was chosen based on considerations to obtain accurate data and agreement to find out how data management on the patrol ship is related to public management. According to Moleong (2018), research instruments are data collection tools such as tests in quantitative research.

## RESULT AND DISCUSSION

### **Efficiency of operational data management of patrol vessels through an integrated information system at the Bitung Class II Coast Guard Base**

Efficiency in management is a fundamental principle that aims to optimize resources in order to produce maximum performance with minimal cost and time. Efficiency is defined as the ability to optimize resources to produce the best results in minimum time and cost (Wijaya et al: 2024). In the context of patrol boat management, efficiency plays an important role in ensuring that every operational aspect, from mission planning, fuel management, maintenance, to reporting, can run optimally.

Efficiency is often associated with the principles of Taylorism or "Scientific Management" which emphasizes the importance of systematization and the use of technology to improve productivity: "Taylorism, or scientific management, emphasizes systematization and the use of science and measurement to improve work efficiency and productivity—principles still relevant in digital and automated work environments today (World of Work Project: 2024). Thus, the implementation of an integrated information system on a patrol boat is in line with this principle, as it allows for better resource management and reduced waste.

Regulations related to the efficiency of patrol boat fleet management have been regulated in various national and international regulations. The International Maritime Organization (IMO) in its regulations, such as SOLAS (Safety of Life at Sea) and MARPOL (Marine Pollution), emphasizes the importance of technology-based ship management to improve safety and operational efficiency. In addition, in the Regulation of the Minister of Transportation of the Republic of Indonesia Number 34 of 2012 concerning the Ship Safety and Security Management System, it is stated that the use of information technology in ship operations is a strategic step in increasing shipping efficiency and security.

Finally, effective resource management focuses not only on physical availability, but also on empowerment and development of human resource capacity. Only with a synergistic combination of humans, technology, and a supportive work culture, will the integrated information system be able to run optimally to improve the efficiency of patrol boat operational data management.

#### **1. Information Systems**

Information systems are one of the fundamental concepts in supporting decision-making and data management in various organizations, both public and private sectors. According to Laudon and Laudon (2020), an information system is a series consisting of hardware, software, procedures, and humans designed to collect, process, store, and distribute information to support decision-making, coordination, control, and analysis in an organization. In other words, an information system is not just

technology, but also a management process integrated with human resources to achieve organizational goals.

The system is a component that is collected and has a relationship with each other, either physical or non-physical, which together work towards a predetermined goal harmoniously (Prehanto: 2020). Meanwhile, Ridho (2018) states that the system is seen as a collection of limiting rules, both from the capacity of the system itself and the environment in which the system is located to provide a guarantee of justice and harmony.

Meanwhile, Elisabet and Rita (2017) stated that information systems in organizations are tasked with meeting daily transaction processing needs, supporting operational management, and providing strategic information for decision making.

This view is reinforced by Pratama in Risdiansyah (2017) who explained that an information system is a combination of four main elements: hardware, software, network infrastructure, and trained human resources. These four elements must function synergistically so that the system can work optimally. Nataniel and Heliza (2019) added that an information system is a series of processes consisting of data collection, processing, and presentation of information that aims to support effective and efficient decision making.

By summarizing the views of these experts, it can be concluded that information systems are not just about advanced technology, but rather a comprehensive framework that combines humans, technology, and procedures to support effective data management and decision making. Information systems are an important pillar in the digital era that demands speed, accuracy, and integration of information in every line of the organization.

Integrated information systems play an important role in supporting the efficiency of operational data management at the Bitung Class II Coast Guard Base (PPLP). This concept refers to the use of technology that connects all work units such as operations, logistics, administration, and finance in one integrated platform. However, findings in the field show that the information system at PPLP Bitung is still far from expectations. The KPLP SIM system that is relied on only receives monthly reports, so it does not support real-time data access. Spreadsheets and Google Drive used as a complement also experience limited access because they depend on the quality of the internet network which is often unstable, especially on patrol ships that only rely on the crew's personal connections. These limitations cause delays in decision-making and supervision, especially in urgent situations that require up-to-date and valid data.

This condition is exacerbated by the integration of systems between units that have not been fully effective. Data from operational, logistics, and administrative units are still processed in silos and manually, although some of the ship's technical information has been entered into the KPLP SIM. As a result, reporting that requires consolidation from various units takes longer and is prone to errors. Ship damage reports, logistics requests, and other operational data are often still compiled manually before being inputted into the digital system, which not only slows down the process but also opens up opportunities for data duplication and inconsistency.

Security and data accuracy are also major concerns. Systems that rely on Google Drive and spreadsheets rely solely on limited user access settings, so the potential for data manipulation remains. Although the KPLP SIM is managed centrally and has a better level of security, this system is still limited to ship technical data and does not yet cover comprehensive and real-time overall reporting. This late and unintegrated

information can have a direct impact on the quality of strategic decision-making in the field.

Looking at the description above, it can be seen that the root of the problem lies in inadequate technological infrastructure, limited human resource training, and weak digital-based work culture. Unstable internet connections on ships, the lack of supporting devices such as starlink, and servers that often experience downtime during simultaneous reporting make it difficult for the system to function optimally. In addition, digital literacy is not evenly distributed among HR, although most have received basic training, resulting in system implementation still being mixed between manual and digital.

In comparison with previous theories and research, Widodo, S. & Suryadi, A. (2020) the application of digital systems in the maritime sector has indeed been proven to be able to increase the efficiency and speed of operational processes. However, they also emphasized that the effectiveness of the system depends on the readiness of infrastructure and HR competence. This is in line with the findings at PPLP Bitung, where limited hardware, servers, and internet networks are the main obstacles that hinder the creation of a reliable integrated information system.

This condition is reinforced by the Resource-Based View theory (Barney, 2017), which emphasizes that an organization's competitive advantage depends on its ability to manage valuable, rare, and difficult-to-imitate resources. In the context of PPLP Bitung, unequal digital literacy and minimal supervision of system implementation are significant obstacles. As a result, even though the information system is available, the management of patrol boat operational data is not yet efficient, fast, and accurate as expected.

To overcome this problem, strategic steps are needed such as improving technological infrastructure, ongoing digital literacy training, and implementing stricter data security. The installation of a satellite-based internet network, such as Starlink, will be a solution for stable connections on patrol ships, while the provision of automatic input devices and backup systems will minimize the risk of data loss. Placing competent human resources in strategic units and strengthening a digital work culture also need to be a priority so that the system runs optimally.

These steps must be accompanied by a commitment to the principles of transparency, accountability, and responsiveness that are the basis of modern public services. When the integrated information system in PPLP Bitung can be realized properly, then the reliability, accessibility, integration, security, and accuracy of the data will increase. The impact is not only to accelerate decision-making, but also to improve the quality of maritime security services that are adaptive to future challenges.

If PPLP Class II Bitung can overcome these challenges, a reliable information system will strengthen the operational management of patrol vessels, minimize the risk of disruption, and ensure a faster response to critical situations. An integrated information system will be an important foundation for facing the digital era and increasing Indonesia's competitiveness in global maritime security.

## CONCLUSION

Procedures, although there are standard operational guidelines as reflected in the implementation of SIM KPLP, these procedures do not fully support real-time reporting and data processing. The technical reporting process for ships is only carried

out once a month, while other workflows such as logistics and administration still use a manual approach. This causes delays in decision-making and lack of integration between units which has the potential to hinder the effectiveness and efficiency of patrol ship operations.

In terms of resources, both technological and human, PPLP Bitung faces a number of significant challenges. Limited internet network infrastructure, especially on patrol ships that only rely on personal crew connections, causes the information system to be inaccessible stably. In addition, HR competencies in digital literacy still vary, even though basic training has been provided. The lack of supporting technological resources, such as automatic data input devices and reliable servers, also weakens operational data management that should be able to be done quickly and accurately.

Information systems: although there are digital systems such as SIM KPLP, their implementation is still limited to ship technical reporting. Data from logistics, administration, and operational units are still managed separately without comprehensive integration. The systems used, such as Google Drive and spreadsheets, have limitations in terms of security, accuracy, and access speed. In addition, the system is not equipped with automatic backup or strong authentication, making it prone to input errors and data manipulation. This results in the existing information system not being able to support data-based strategic decision-making effectively.

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