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The Influence of Leadership Roles and Organizational Commitment on Increasing the Effectiveness of the Safety Management System at Ngloram Airport, Blora Regency, Central Java

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Keywords
Leadership Role, Organizational Commitment and SMS Effectiveness Improvement.

Abstract
This study aims to analyze the influence of leadership roles and organizational commitment on increasing the effectiveness of the Safety Management System at Ngloram Airport, Blora Regency, Central Java. This research uses quantitative methods with an explanatory research design and a sample of 37 respondents determined using statistical formulas. The sampling technique applied is simple random sampling, in which the selection is conducted randomly. The data analysis methods used in this study are simple linear regression analysis and multiple linear regression analysis. The results of this study demonstrate a positive and significant influence, indicating that the leadership role in increasing the effectiveness of the Safety Management System is both significant and positive, with a coefficient of determination of 82.1%. Organizational commitment also shows a significant and positive influence on the effectiveness of the Safety Management System, with a coefficient of determination of 61.4%. Collectively, the leadership role and organizational commitment have a significant and positive influence on increasing the effectiveness of the Safety Management System, with a coefficient of determination of 84.6%, where the leadership role has a more dominant effect compared to organizational commitment. Therefore, to further enhance the effectiveness of the Safety Management System at Ngloram Airport, Blora Regency, Central Java, it is essential to pay particular attention to leadership role factors and organizational commitment to ensure better performance among operators, especially in improving the effectiveness of the Safety Management System, which is still not fully optimal.

INTRODUCTION

Aviation safety is defined as a state in which all safety requirements regarding the use of airspace, aircraft, airports, air transportation, flight navigation, and other supporting as well as public facilities are fulfilled (Mwikya & Angeline, 2018). However, in practice, numerous challenges remain in ensuring safety across airspace, aircraft, airports, air transportation, flight navigation, and associated facilities (Sciences et al., 2018). This is evidenced by the persistence of accidents and incidents within the aviation sector (Insley & Turkoglu, 2020). In certain periods,

specific airspace areas experience heavy congestion, creating hazards in flight traffic services (Thipphavong et al., 2018).

For many years, aviation safety has been of paramount concern, primarily because the risk of fatalities from airplane accidents is significantly higher than from other transportation modes (Dismukes, Berman, & Loukopoulos, 2017). Aviation accidents often result in a considerable number of fatalities, reinforcing why safety is the principal priority in flight operations (Pidgeon & O'Leary, 2017). Data obtained previously demonstrates that, from 2009 to 2014, air transportation in Indonesia experienced notable growth (Spasojevic, Lohmann, & Scott, 2018). According to the Directorate General of Civil Aviation under the Ministry of Transportation, in 2009, passenger numbers—covering arrivals, departures, and transits, both domestic and international—reached 84,285,105. By 2014, this figure had climbed to 164,005,713, representing a remarkable 94.58% increase over a six-year period. Although there was a 5.99% decrease from 2012 to 2013, likely resulting from the global financial crisis, rising exchange rates, and fuel costs that forced airlines to raise ticket prices, air transportation services now cover nearly all provinces nationwide. This expansion supports regional development and the realization of a reliable national transportation system. Given such substantial growth, the prioritization and continual improvement of aviation safety are critical, aligning with the objectives of the Road Map to Zero Accident program (Khan & Das, 2024).

Aviation accidents may arise from multiple factors: technical issues with aircraft, human error, weather conditions, or airport facility malfunctions (Wiegmann & Shappell, 2017). Each party involved—airport management, air traffic services, airlines, and the Ministry of Transportation—bears responsibility for safety. Preventable weather-related factors remain among the frequent causes of accidents. Furthermore, recurring incidents involving airlines indicate gaps in government enforcement of safety standards and procedures (Price & Forrest, 2024). To address this, the Indonesian government, through the Minister of Transportation, developed the Roadmap to Zero Accident policy (Wismans et al., 2016). One essential initiative is providing guidance to Indonesia's aviation sector in implementing the Safety Management System (SMS) (Faturachman, Lestary, & Agustono, 2023).

A Safety Management System (SMS) systematically and explicitly defines the processes through which safety management is exercised in organizations to achieve acceptable or tolerable safety levels (Khalid, Sagoo, & Benachir, 2021). Implementing SMS is not solely about assembling all required elements, but also about fostering effective interaction among them within the organization (Kim, Rahim, Iranmanesh, & Foroughi, 2019). Safety management should be integrated with the broader business management system and not regarded as a separate or supplementary process (Kontogiannis, Leva, & Balfe, 2017). Present-day management standards—covering environmental, quality, and safety concerns—are designed to be integrated within a unified business management framework.

The core rationale for SMS, whether implemented by operators or regulators overseeing safety, is to provide a systematic approach for achieving an acceptable level of safety risk (Bahr, 2018). SMS is constructed from four fundamental components, including the often-invisible aspect

of safety culture (Mols & Pridmore, 2019). Safety is an ever-present priority in aviation, as enshrined in ICAO's aims and objectives (Article 44 of the International Civil Aviation Convention, Doc 7300, or the Chicago Convention). ICAO defines "Safety" in Doc 9859 as a condition where the risk of harm to individuals or property can be suppressed and maintained at or below acceptable levels through ongoing hazard identification and risk management (Stonkus, 2024). According to ICAO, two primary programs—Safety Program and Safety Management System—are required for safety management:

1. The Safety Programme consists of regulations and guidance for safe operations by aircraft operators and providers of air traffic services (ATS), aerodromes, and maintenance operations. Activities such as incident reporting, investigations, audits, and safety promotion are consolidated within a coherent safety management system.
2. A Safety Management System (SMS) is a systematic approach, encompassing necessary organizational structures, obligations, policies, and procedures for managing aviation safety. For airport operations, this means adopting a management system with defined roles, responsibilities, procedures, and processes aligned with ICAO Annexes 6, 11, and 14, requiring certification and the implementation of SMS by operators, maintenance organizations, ATS providers, and airport operators.

Indonesian Law No. 1 of 2009 on Aviation requires every certified airport operator to establish, execute, evaluate, and continuously enhance an SMS (Koharudin, Ricardianto, Saribanon, & Rafi, 2024). Specifically, Article 217 paragraph (3) letter d outlines that airport certification requires an operational SMS (Hinsch, 2018). Realizing this system requires establishing a dedicated unit led by a safety manager and staff focused exclusively on SMS implementation.

The legal foundation for SMS encompasses Annex 14 Aerodrome, ICAO Documents 9774 and 9859, Law No. 1 of 2009, Indonesia's Minister of Transportation Regulation No. PM 62 of 2017 on Civil Aviation Safety (Part 19, SMS), and PM 93 of 2016 on the National Aviation Safety Program. These regulations collectively mandate that airport operators design, implement, evaluate, and continually improve their SMS.

SMS implementation strategies must be tailored to each airport's unique characteristics, including operational facilities and the number of aircraft movements. Thus, a universal SMS is impractical; site-specific adaptation is crucial for effective airport operations.

For instance, South Sulawesi, particularly Makassar, stands out as a hub for tourism, business, and culture, operating as the gateway to eastern Indonesia. Management of Sultan Hasanuddin Airport has been entrusted to PT. Angkasa Pura I (Persero), a state enterprise under the Ministry of State-Owned Enterprises and the Ministry of Transportation. PT. Angkasa Pura I plays a pivotal role in aviation, bridging sectoral responsibilities and supporting national development initiatives.

One core function of PT. Angkasa Pura I is managing both commercial and non-commercial airports. Effective organizational management relies on a strong commitment and unified perceptions among employees. Leadership occupies a central position in achieving

organizational objectives, including cultivating a positive work culture. Leadership rooted in dedication and loyalty inspires and coordinates staff, providing the motivation and direction necessary to achieve shared goals. As Siagian (2002:62) identifies, leadership is a person's ability to influence others so they can fulfill objectives, even if the task is personally unwelcome. Dubrin (2005) reiterates that the communication skills inherent in leadership compel team members to pursue organizational goals. The situational (contingency) leadership approach by Fiedler (1967) suggests that a leader's focus on task structure, relationships, and formal authority can affect organizational outcomes. Day & Lord (1988) confirm the significant impact leadership has on attaining organizational achievements, including the performance goals of the Safety Management System at Ngloram Airport, Blora Regency, Central Java.

Prior research examined aspects of SMS implementation. Indah D. Rahayu et al. (2017) found that leadership style and occupational safety programs notably influence motivation within aviation contexts, while Ria Mardiana & Yusuf Darman Syarif (2017) affirm that organizational commitment is critical for employee performance. However, neither study specifically assessed the combined influence of leadership roles and organizational commitment on SMS effectiveness in regional settings like Ngloram Airport. Addressing this research gap is pertinent given the unique operational challenges small regional airports in Indonesia face.

This research is particularly urgent, considering the growing needs of Indonesia's expanding air transport sector and the critical roles regional airports occupy as connectivity hubs. With the number of air passengers continually rising, efficient and effective SMS implementation is essential for preventing accidents and incidents. The distinctive value of this study lies in its focus on Ngloram Airport as a case for regional SMS practices and in scrutinizing the relationship between leadership roles and organizational commitment—two variables not thoroughly investigated together within Indonesia's airport safety context.

Based on the above context, this study emphasizes the importance of organizational commitment. Its objectives are to analyze how leadership roles influence SMS effectiveness at Ngloram Airport, to examine the impact of organizational commitment on SMS, and to determine the combined effect of both factors on improving SMS effectiveness. This research aims to offer practical insights for airport management in developing robust safety strategies, academic contributions to aviation safety literature, and policy recommendations for SMS enhancement at similar regional airports in Indonesia. Ultimately, the findings are expected to optimize safety performance and support the sustainable development of the nation's aviation infrastructure.

RESEARCH METHOD

The quantitative approach was applied in this study, consistent with Creswell's view that quantitative research involves explaining how variables affect one another. The research drew upon relevant theory, formulated hypotheses for each variable relationship, and employed operational measurements. Data processing was conducted using statistical analysis, allowing for clear conclusions and findings.

This study was categorized as explanatory research, as it aimed to clarify the

influence between variables by hypothesis testing. Mardalis (2007) noted that explanatory research seeks to examine outcomes based on manipulation or control of certain variables. The methodology relied on a deductive approach, beginning from theoretical frameworks, expert opinions, and the researcher's experience, and progressing to the formulation and justification of research problems based on empirical data.

Data collection methods in this study included questionnaires, interviews, and observations. Questionnaires were used to collect responses from predetermined participants. Items were carefully designed in accordance with questionnaire-writing principles, focusing on relevant content and clarity. Interviews provided additional insights and clarification on problems identified from questionnaire responses. Unstructured interviews were chosen to obtain supplementary information from participants. Observations of leadership roles and organizational commitment at Ngloram Airport were conducted prior to formal data collection. These observations informed the development of research instruments related to SMS effectiveness.

Sugiyono (2012) asserted that quantitative data analysis relies on statistical calculations, such as the Likert scale. In this study, descriptive statistical methods were used to analyze the impact of leadership roles and organizational commitment on SMS effectiveness.

a. Validity and Reliability Tests

- Validity tests assessed whether the research instruments accurately represented the constructs being measured, using bivariate correlations between indicators and overall construct scores.
- Reliability tests, assisted by SPSS and the Cronbach Alpha statistic, determined whether the instruments consistently measured variables.

b. Classical Assumption Testing: Model estimations were evaluated for basic assumptions to ensure analytical accuracy. This included tests for multicollinearity, heteroscedasticity, and serial correlation.

1. Normality
   The Kolmogorov-Smirnov test was used to determine whether sample data originated from a normally distributed population.
2. Heteroscedasticity
   The Glejser test checked if model variance remained homogeneous.

- If the probability was under 0.05, heteroscedasticity was detected.
- If above 0.05, the variance was considered homogeneous.

3. Autocorrelation
   The Durbin Watson statistic identified whether residuals were correlated—a concern mainly for time series data.
4. Multicollinearity: Multicollinearity among independent variables was evaluated using the Variance Inflation Factor (VIF); values above 10 indicated collinearity.

c. Determination Analysis: The coefficient of determination (R^2) measured

how well the regression model explained variability in the dependent variable, specifically regarding leadership roles and organizational commitment.

d. Regression Analysis: Regression equations were used to predict the dependent variable (SMS effectiveness) based on independent variables (leadership roles and organizational commitment):

$$\hat{Y} = a + b_1X_1 + b_2X_2$$

Where:

- a= constant
- b_1= coefficient for leadership role
- b_2= coefficient for organizational commitment
- Y= effectiveness of SMS
- X_1= leadership role
- X_2= organizational commitment

Statistical hypothesis tests determined whether findings could be generalized.

1. T Test: T-tests assessed the significance of regression coefficients. If the computed value exceeded the table value, the null hypothesis was rejected, indicating a significant effect.
2. F Test: F-tests evaluated the collective impact of variables on SMS effectiveness. If the computed F-value was higher than the table value, at least one independent variable had a significant effect.

RESULTS AND DISCUSSION

The Relationship of the Role of Leadership to Increase the Effectiveness of Safety Management Systems

Robbins and Judge (2015) stated that leadership is the ability to influence a group towards achieving a vision or set of goals of the organization of which they are members. Meanwhile, according to **John Adair (2008)** that: "A leader is a person who has certain personality qualities and disposition, who corresponds to the general situation supported by technical knowledge and relevant experience, who is able to provide the necessary functions to guide the group to achieve goals and at the same time maintain and build team unity, which is done in appropriate proportions with the help of other team members". Effectiveness is defined by many experts, according to **(Harbani Pasolong (2007:4),** Effectiveness means that a previously planned goal can be achieved or with the word goal achieved due to the activity process. The word effectiveness cannot be equated with efficiency, because the two have different meanings even though in various uses the word efficiency is closely related to the word effectiveness. Efficiency contains the notion of comparison between costs and results, while effectiveness is directly linked to the achievement of goals.

According to **(Siagian 2003:27),** Effectiveness is the completion of work not only

in terms of achieving goals but also in terms of timeliness in achieving these goals. Safety Management can be described as the systematic application of specific technical and managerial skills to identify and control hazards and associated risks. **(Mihailovici, 2013). Ludwig *et al.* (2007)** defines SMS as a proactive approach to managing safety that is concentrated in process control rather than relying only on inspections and corrective actions on the final product. From the wetting and theory, it is true that there are indicators that have a great influence on the influence of the leadership role on the Increase in the Effectiveness of the Safety Management System which are contained in the following indicators: Ability indicator of (0.875), Praise indicator of (0.855) and Responsibility indicator of (0.848), which can also be seen in the perception of respondents in the leadership role in the dimension of cooperation (4.35) with The dominant indicator is the ability indicator (4.27) and the praise indicator (4.31) while in the leadership dimension (4.39) the dominant indicator is responsibility (4.45).

The Relationship of Organizational Commitment to Improving the Effectiveness of Safety Management Systems

According to **David** in **Sopiah (2008:163)** said that there are factors that affect employee commitment to the organization, namely:

1. Personal factors: age, gender, education level, work experience, personality.
2. Characteristics of the job: scope of position, challenges in the job, role conflicts in the job, level of difficulty in the job.
3. Characteristics of the structure: the size or size of the organization, the form of the organization, the presence of trade unions, the degree of control exercised by the organization.
4. Work experience: employees who have longer work experience than those who have recently had different levels of commitment.

Many studies have been conducted to find out the factors that support and strengthen the work commitment of employees in achieving organizational goals, including research conducted by **Streers and Porter, Mowday and Fukami and Larson**. They classify the factors that affect organizational commitment into 4 (four) categories, namely:

1. Personal characteristics, such as age, working period, motivation for achievement that have a positive relationship with work commitment. It was also found that there was an influence on race, gender, and job satisfaction. Meanwhile, education level has a negative relationship with work commitment.
2. Characteristics of work. Such as stress has a negative relationship with work commitments and job enrichment, clarity of tasks, role suitability, job challenges, opportunities to interact with others and feedback related to work commitments.
3. Structural characteristics. Work commitment is positively correlated with the level of formalization, professional dependency, decentralization and participation rate in

decision-making, the amount of contribution that employees cultivate and the control function of the company.

Effectiveness is defined by many experts, according to (Harbani Pasolong 2007:4), Effectiveness means that a pre-planned goal can be achieved or with the word goal achieved due to the process of activity. The word effectiveness cannot be equated with efficiency, because the two have different meanings even though in various uses the word efficiency is closely related to the word effectiveness. Efficiency contains the notion of comparison between costs and results, while effectiveness is directly linked to the achievement of goals. According to (Siagian 2003:27), Effectiveness is the completion of work not only in terms of achieving goals but also in terms of timeliness in achieving these goals.

Safety Management can be described as the systematic application of specific technical and managerial skills to identify and control hazards and associated risks. (Mihailovici, 2013:86). Ludwig et al. (2007) defines SMS as a proactive approach to managing safety that is concentrated in process control rather than relying only on inspections and corrective actions on the final product.

From the wetting and theory, it is true that there are indicators that have a great influence on the influence of organizational commitment to Increasing the Effectiveness of the Safety Management System which are contained in the following indicators: the giving indicator is (0.915), the action indicator is (0.892) and the fulfillment indicator is (0.862), where in the respondents' perception of the organizational commitment variable can be seen:

- In the motif dimension (4.31) with the dominant indicators of giving (4.32) and acting indicators (4.41).
- In the factor dimension (4.24) with the dominant indicator is the fulfillment indicator (4.46).

CONCLUSION

The findings indicate that leadership roles significantly and positively impacted the effectiveness of the Safety Management System (SMS), supported by a determination coefficient of 82.1%, while organizational commitment also had a notable positive effect with a coefficient of 61.4%; combined, these factors achieved a coefficient of 84.6%, with leadership exerting a stronger influence than organizational commitment, highlighting the critical role of both elements in optimizing airport safety management. For future research, it is recommended to examine how specific leadership styles and different forms of organizational commitment contribute to SMS effectiveness across various types and sizes of airports, ensuring best practices can be tailored to diverse operational environments.

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