Published by Yayasan Amerta Insan Unggul

DOI: 10.65246

p-ISSN 3063-9840 | e-ISSN 3063-8194

GoodWill Journal of Economics, Management, and Accounting

journal homepage: hhttps://jurnal.amertainstitute.com/index.php/GoodWill

The Influence of Implementing Information and Communication Systems Towards the Effectiveness of Health Management Systems and Work Safety at Pt. Karsa Earth Maros Regency

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ARTICLE INFO

Keywords:
Information systems, Communication Systems, K3 Management Effectiveness

Manuscript Submission Story ID 528
Submitted on June 23, 2025, the manuscript underwent a revision (April 2, 2026) and peer review (April 25, 2026). Following the editor's decision on the same day, it was published on April 30, 2026.

ABSTRACT

The aim of this research is a type of quantitative research with the aim of determining the influence of information and communication systems on the effectiveness of the Occupational Health and Safety management system at PT. Bumi Karsa, Maros Regency. The type of data used in this research is quantitative data obtained from distributed questionnaires and is related to the problem being studied. Data collection was carried out by distributing questionnaires. In this research, the data sources used in data collection include primary data and secondary data. The research instrument used in this research used the Likert scale method. Based on the results of data research using statistical calculations through the Statistical Package for the Social Science (SPSS) version 25 application regarding the influence of implementing information and communication systems on the effectiveness of the Occupational Health and Safety management system at PT. Bumi Karsa, Maros Regency, which was discussed in the previous chapter, the author draws an important conclusion, namely that the information system has a positive and statistically insignificant effect on the effectiveness of the Occupational Health and Safety management system and communication has a positive and significant effect on the Occupational Health and Safety management system. The information system needs to be improved to support the effectiveness of the Occupational Health and Safety management system and the communication system which has a positive and significant influence must continue to be maintained and improved so that the effectiveness of the Occupational Health and Safety management system is well maintained.

1. Introduction

In the era of globalization and rapid industrial development, information and communication systems have become increasingly essential across various sectors, including occupational health and safety (OHS). An information system is an activity carried out both in managing organizational data and in providing instructions related to the duties and responsibilities of each employee. Safety information covers a broad subject and can take various forms, including statistical data, descriptive information, reference data, original texts, quantitative and qualitative materials, computer-readable databases, safety illustrations, and research findings related to workplace safety issues. Historically, information needs were fulfilled through conventional communication methods, both verbal and written, before the emergence of photography, radio communication, film, television, and video production technologies. Although mass media facilitates electronic communication, safety information remains selective because not everyone requires or is interested in the same type of information.

Communication application refers to the communication process between the communicator and the recipient to achieve a common goal. Communication is the process of conveying ideas, expectations, and messages through specific symbols containing meaning, enabling both parties to reach mutual understanding (Widjaja, A. W., 2019). In the context of occupational safety, safety communication serves as a medium that allows

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people, work processes, and organizational systems to interact proportionally to achieve occupational health, safety, and environmental objectives. Through communication, safety-related information can be delivered and discussed from management to workers. The communication method used significantly influences workers' understanding and participation in occupational safety practices (Achmad, A. N., 2021).

Occupational health and safety (OHS) is one of the essential maintenance programs implemented within organizations to create safe working systems and integrated work environments that support productivity while minimizing workplace accidents. OHS aims to ensure that human resources can contribute optimally to organizational performance. Workplace safety and health are fundamental needs for workers, employers, and governments because workplace accidents in Indonesia remain relatively frequent (Ardi, S. Z., & Hariyono, W., 2018). According to the National Occupational Safety Profile of Indonesia (2022), workplace accident and occupational disease data from the BPJS Employment Work Accident Insurance (JKK) program continue to show increasing trends annually. In 2021, there were 234,370 reported cases resulting in 6,552 worker fatalities, representing a 5.7% increase from 2020. These statistics indicate that OHS implementation must become a greater priority within Indonesian workplaces.

Government Regulation No. 50 of 2012 concerning the Implementation of Occupational Health and Safety Management Systems (OHSMS) states that OHS encompasses all activities aimed at ensuring and protecting worker safety and health through accident prevention and mitigation of occupational diseases. The implementation of OHS fundamentally aims to protect workers from workplace accidents, occupational diseases, and other work-related health disturbances while ensuring that organizational production processes operate efficiently and productively. Communication also enables individuals within organizations to interact intentionally and collaborate effectively to avoid workplace accidents and environmental hazards (Narayan, R., & Nair, V. K., 2021). Therefore, organizations practicing two-way communication are required to provide workers with relevant information regarding risks and hazards while also addressing worker complaints and offering effective solutions.

The integration of information and communication systems (ICS) into OHS management has become increasingly important because technological advancements facilitate rapid information access, improve data management, and strengthen communication among stakeholders. Setiawan et al. (2020) revealed that implementing digital information systems in OHS management can reduce workplace accidents by up to 30% through more integrated supervision. Such systems support early detection of potential risks and provide accurate data for decision-making processes. Similarly, Wijaya et al. (2021) found that mobile applications for OHS incident reporting can accelerate reporting processes by up to 50%, enabling faster mitigation actions. These studies indicate that technology-based incident management systems improve efficiency and responsiveness in managing workplace risks.

However, despite the increasing importance of ICS implementation, several challenges remain unresolved. According to the Ministry of Manpower report (2022), major obstacles include inadequate digital infrastructure, low worker digital literacy, and resistance to organizational change. Rahmawati (2019) also emphasized the importance of structured workplace accident data management using information technology to improve risk evaluation and mitigation strategies. Existing studies generally focus on the technological benefits of ICS implementation but provide limited discussion regarding how integrated communication systems influence the effectiveness of Occupational Health and Safety Management Systems (OHSMS) within manufacturing and construction industries. In addition, previous research has not adequately explored the relationship between communication effectiveness, integrated information systems, and OHSMS implementation in companies operating within high-risk industrial environments.

Based on these gaps, this study specifically investigates the impact of information and communication system implementation on the Occupational Health and Safety Management System at PT. Bumi Karsa. PT. Bumi Karsa operates within the manufacturing and construction industry, where workplace safety risks are considerably high, making effective OHS management highly critical. The company has

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implemented various digital technologies to improve operational efficiency and workplace safety management, creating opportunities to examine how integrated information systems contribute to safer and more sustainable working conditions.

Accordingly, the research problem addressed in this study is how the implementation of information and communication systems influences the effectiveness of the Occupational Health and Safety Management System at PT. Bumi Karsa. Therefore, this study aims to analyze the impact of information and communication system implementation on the effectiveness of OHSMS practices within the company.

Theoretically, this study contributes to the development of OHS and organizational communication literature by expanding understanding of how information systems and communication processes support the effectiveness of workplace safety management systems in high-risk industries. Practically, the findings are expected to provide valuable insights for company management, policymakers, and OHS practitioners regarding the strategic role of integrated information and communication systems in improving workplace safety, operational efficiency, and employee welfare. The novelty of this study lies in its focus on examining the integration of information and communication systems within OHSMS implementation at PT. Bumi Karsa, particularly in the context of manufacturing and construction industries in Indonesia, which remain underexplored in previous studies.

2. Literature Review

2.1 Conceptual and Theoretical Foundations

2.1.1 Information System

An information system is a structured work system involving data collection, processing, storage, and dissemination to support organizational decision-making and operational activities. According to Jonny Seah (2020), an information system represents the integration of various information technology components that work collaboratively to generate useful information and facilitate communication within organizations or groups. In organizational contexts, information systems consist of several interrelated components, including hardware, software, databases, networks, and human resources, all of which function collectively to improve organizational performance and operational effectiveness.

Theoretically, information systems are closely associated with organizational efficiency and strategic management theories, emphasizing how technology integration can improve coordination, decision-making, and organizational competitiveness. Information systems not only process transactional and operational data but also support analytical functions that assist managers in generating evidence-based decisions. Furthermore, information systems contribute to organizational adaptability by enabling faster communication, reducing human error, and automating repetitive business processes.

The implementation of information systems has become increasingly important in modern organizations due to the growing complexity of organizational operations and the need for real-time information. By utilizing integrated technologies, organizations can effectively manage data security, maintain information integrity, and improve collaboration among organizational members. Consequently, information systems are considered essential organizational assets that facilitate strategic planning, operational control, and organizational sustainability.

2.1.2 Objectives of Information Systems

The primary objective of information systems is to provide accurate, relevant, and timely information that supports organizational decision-making processes. According to Ismail et al. (2021), well-implemented information systems improve operational efficiency, support strategic decision-making, and enhance user experience through accessible and user-friendly interfaces. Similarly, Khan et al. (2020) categorize the objectives of information systems into several strategic dimensions.

First, information systems aim to enhance operational efficiency through automation and process optimization. Automation minimizes manual activities, reduces operational errors, and accelerates organizational workflows. Tiwari et al. (2021) argue that appropriate technological implementation enables organizations to optimize resource utilization and improve productivity.

Second, information systems support data-driven decision-making processes. Through

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integrated data management and analytical capabilities, organizations can generate structured and accurate information to support managerial decisions. Sharma and Jain (2022) emphasize that information systems facilitate predictive analysis and risk reduction while improving organizational responsiveness to emerging business opportunities.

Third, information systems enhance communication and collaboration within organizations. Integrated systems facilitate rapid information exchange among departments and organizational units, thereby improving coordination and teamwork. According to Kiran et al. (2021), effective information systems strengthen organizational communication structures and improve collaborative performance across operational functions.

Fourth, information systems contribute to customer service improvement through the implementation of Customer Relationship Management (CRM) systems and personalized service platforms. Zhao et al. (2022) explain that information systems enable organizations to better understand customer preferences, accelerate service responses, and improve customer retention.

Finally, information systems provide organizations with competitive advantages by improving innovation capability, operational flexibility, and strategic responsiveness. Prasad and Gupta (2021) state that organizations adopting effective information systems are more capable of responding to market changes and strengthening their competitive positioning.

2.1.3 Workplace Safety Communication System

Workplace safety communication refers to the process of delivering information related to occupational hazards, preventive measures, safety procedures, and emergency responses within organizational environments. Effective communication systems are essential components of Occupational Health and Safety Management Systems (OHSMS) because they ensure that employees receive accurate and timely safety information. According to Kumar and Gupta (2020), effective workplace safety communication enhances employee awareness regarding occupational risks and contributes significantly to accident prevention.

The theoretical foundation of workplace safety communication is strongly associated with safety culture theory, which emphasizes organizational commitment, employee participation, and continuous communication regarding occupational safety. Effective communication mechanisms strengthen organizational safety culture by encouraging compliance with safety procedures and fostering proactive safety behavior among employees. Research conducted by Tushar et al. (2022) indicates that organizations with effective safety communication systems tend to demonstrate higher levels of employee safety awareness and stronger organizational safety performance.

Communication systems in workplace safety involve both internal and external communication processes. Internal communication includes the dissemination of company safety policies, hazard identification, risk assessments, standard operating procedures (SOPs), safety training programs, accident investigation results, and organizational changes affecting occupational safety. External communication involves interactions with contractors, suppliers, visitors, and third parties regarding occupational safety requirements and safety performance standards.

The implementation of structured workplace safety communication systems contributes to the development of proactive safety cultures within organizations. Through regular meetings, safety training, hazard reporting systems, and feedback mechanisms, organizations can minimize workplace risks and improve employee compliance with safety regulations. Additionally, communication mechanisms such as monitoring, supervision, and employee participation in safety reporting strengthen organizational commitment toward occupational health and safety implementation.

2.2 Review of Empirical Studies

Recent empirical studies demonstrate that information systems significantly influence organizational effectiveness, operational efficiency, and communication quality. Studies conducted by Ismail et al. (2021) found that integrated information systems positively affect managerial decision-making and improve organizational productivity through enhanced data accessibility and automation processes. Similarly, Sharma and Jain (2022) revealed that data-driven information

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systems improve organizational responsiveness and reduce decision-making risks through predictive analytical capabilities.

Several studies also emphasize the role of information systems in improving organizational communication and collaboration. Kiran et al. (2021) reported that integrated communication systems facilitate coordination among organizational units and improve teamwork effectiveness. Furthermore, research by Zhao et al. (2022) demonstrated that information systems significantly improve customer relationship management and service quality through personalized communication and rapid response mechanisms.

In the context of workplace safety communication, empirical evidence indicates that effective communication systems contribute significantly to occupational safety performance. Kumar and Gupta (2020) found that organizations implementing structured safety communication systems experience lower workplace accident rates and improved employee safety compliance. Similarly, Tushar et al. (2022) concluded that continuous safety communication strengthens organizational safety culture and increases employee participation in hazard reporting activities.

Despite these findings, previous studies predominantly focus on large-scale industrial organizations and manufacturing sectors, while limited attention has been given to the integration of information systems and workplace safety communication in broader organizational contexts. Moreover, many prior studies analyze information systems and workplace safety communication separately, resulting in insufficient understanding regarding the interconnected role of information systems in supporting occupational safety communication effectiveness.

2.3 Identification of the Research Gap

Based on the synthesis of theoretical and empirical studies, several research gaps can be identified. First, although numerous studies discuss the effectiveness of information systems in improving organizational performance, limited research specifically examines their role in supporting workplace safety communication systems. Existing studies generally focus on operational efficiency, customer service, or decision-making processes without adequately addressing occupational safety communication dimensions.

Second, previous empirical studies primarily investigate workplace safety communication from behavioral and organizational culture perspectives, with minimal emphasis on technological integration through information systems. Consequently, there remains insufficient empirical evidence regarding how information systems facilitate communication effectiveness in Occupational Health and Safety Management Systems (OHSMS).

Third, most previous studies were conducted in industrialized and manufacturing environments, creating contextual limitations regarding the applicability of findings across different organizational sectors and developing-country contexts. Therefore, further research is needed to explore the relationship between information systems and workplace safety communication in broader organizational settings and contemporary technological environments.

Accordingly, this study aims to address these gaps by examining the role of information systems in enhancing workplace safety communication and supporting organizational safety culture development.

2.4 Development of the Conceptual Framework

This study focuses on the relationship between information systems and workplace safety communication. Information systems are conceptualized as integrated technological systems that facilitate data processing, communication, coordination, and decision-making within organizations. Meanwhile, workplace safety communication refers to organizational processes involving the dissemination of safety-related information, hazard reporting, safety training, and communication regarding occupational risks and preventive measures.

The relationship between these variables is based on the assumption that effective information systems improve communication quality, accessibility of safety information, and organizational responsiveness to occupational hazards. Integrated information systems enable organizations to disseminate safety information more efficiently, strengthen employee participation in safety reporting, and support continuous

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monitoring of occupational safety performance.

Consequently, organizations implementing effective information systems are expected to demonstrate stronger workplace safety communication practices, improved employee safety awareness, and enhanced occupational safety culture.

2.5 Hypotheses or Research Propositions

Based on the conceptual framework and previous empirical findings, the following research hypothesis is proposed:

H1: Information systems have a positive and significant effect on workplace safety communication.

H2: Effective workplace safety communication positively contributes to the development of organizational safety culture.

H3: Information systems indirectly support organizational safety culture through the enhancement of workplace safety communication.

3. Research Methods

3.1 Research Design

This study uses a quantitative research approach with a causal associative design. The quantitative approach is considered appropriate because the study aims to measure and analyze the influence of independent variables on the dependent variable using statistical procedures. The causal associative design is employed to identify and analyze the relationships between work discipline and professionalism as independent variables and the quality of public services as the dependent variable. This design enables the researcher to examine the extent to which changes in work discipline and professionalism contribute to changes in public service quality.

3.2 Research Context and Setting

The research was conducted at the Manpower Office of Makassar City. This institution was selected as the research setting because it plays an important role in providing public services related to employment administration and workforce management. The relevance of the institution to the research topic provides an appropriate context for examining how employee work discipline and professionalism influence the quality of public services delivered to the community.

3.3 Population and Sample / Research Participants

The population of this study consists of employees of the Manpower Office of Makassar City. The sampling technique used is purposive sampling, in which respondents are selected based on specific criteria relevant to the objectives of the study. The selected respondents are employees who are directly involved in public service activities and possess sufficient understanding of the organizational work environment. The sample size is determined based on statistical considerations to ensure the validity and reliability of the research findings.

3.4 Data Sources and Data Collection

This study utilizes primary data collected directly from respondents. The primary data were obtained through the distribution of structured questionnaires to the selected respondents. The questionnaire consists of closed-ended questions designed to measure respondents' perceptions regarding work discipline, professionalism, and public service quality.

In addition to questionnaires, direct observation and document analysis were also conducted to support and strengthen the data obtained from respondents. The use of multiple data collection techniques is intended to minimize bias and improve the accuracy and comprehensiveness of the research findings.

3.5 Measurement of Variables and Research Instruments

The variables examined in this study include work discipline, professionalism, and public service quality. Work discipline and professionalism function as independent variables, while public service quality serves as the dependent variable. The research instrument used is a structured questionnaire employing a Likert scale to measure respondents' perceptions of each variable.

The indicators used in the questionnaire are developed based on concepts relevant to work discipline, professionalism, and public service quality. The Likert scale allows respondents to express their level of agreement with each statement systematically, thereby facilitating quantitative

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analysis and interpretation of the data.

3.6 Data Analysis Techniques

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS). Several analytical techniques were employed in this study, including validity and reliability tests, classical assumption tests, multiple linear regression analysis, hypothesis testing. The application of these analytical techniques is intended to generate robust and interpretable findings that are aligned with the objectives of the study.

3.7 Validity, Reliability, and Trustworthiness

To ensure the quality and trustworthiness of the research findings, validity and reliability tests were conducted on the research instruments. The validity test was used to determine whether the questionnaire items accurately measure the intended variables, while the reliability test was conducted to assess the consistency of the measurement instruments. These procedures are essential to ensure that the data collected are reliable and suitable for further statistical analysis.

3.8 Ethical Considerations

This study considers several ethical aspects throughout the research process. Respondents participated voluntarily and were informed about the purpose of the study before completing the questionnaire. The confidentiality of respondents' identities and responses was maintained to protect participant privacy and ensure academic integrity. The collected data were used solely for research purposes.

3.9 Research Procedure

The research procedure was conducted systematically through several stages. First, the researcher identified the research problem and determined the research objectives. Second, the researcher designed the research instrument and selected the respondents using purposive sampling. Third, data collection was carried out through questionnaires, observations, and document analysis. Fourth, the collected data were processed and analyzed using SPSS through validity, reliability, classical assumption, regression, and hypothesis testing. Finally, the results of the analysis were interpreted to draw conclusions regarding the influence of work discipline and professionalism on public service quality at the Manpower Office of Makassar City.

3.10 Methodological Limitations

This study has several methodological limitations. First, the research was conducted only at the Manpower Office of Makassar City, which may limit the generalizability of the findings to other institutions or regions. Second, the study relies primarily on questionnaire-based responses, which may be influenced by respondents' subjectivity and perceptions. Third, the use of a quantitative approach may not fully capture deeper contextual factors related to employee behavior and public service practices. Despite these limitations, the study provides valuable insights into the influence of work discipline and professionalism on the quality of public services.

4. Results and Discussion

4.1. Research Results

4.1.1 Sample Description and Descriptive Statistics

a. Respondent Characteristics

In this study, primary data was collected through questionnaires distributed to employees of PT. Bumi Karsa in Maros Regency. The respondent characteristics were analyzed to understand their diversity based on age and education. The data presentation can be seen in the tables below:

1) Respondent Characteristics by Gender

Table 1. Respondent Characteristics by Gender at PT. Bumi Karsa, Maros Regency

Gender	Frequency	Percentage
Male	29	58%
Female	21	42%
Total	**50**	**100%**

Source: SPSS Data Processing Results, 2024

According to Table 1 above, out of a total of 50 respondents, the majority are male, comprising 29 individuals (58%), while the remaining 21 respondents (42%) are female.

2) Respondent Characteristics by Age

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Table 2. Respondent Characteristics by Age at PT. Bumi Karsa, Maros Regency

Age Group	Frequency	Percentage
20-30 years	40	80%
31-40 years	9	18%
Above 40 years	1	2%
Total	**50**	**100%**

Source: SPSS Data Processing Results, 2024

Based on Table 2, the majority of respondents (40 individuals or 80%) are between 20 and 30 years old, while only a few (9 individuals or 18%) are aged between 31 and 40 years.

3) Respondent Characteristics by Education

Table 3. Respondent Characteristics by Education at PT. Bumi Karsa, Maros Regency

Education Level	Frequency	Percentage
Bachelor's Degree (S1)	31	62%
Diploma (D3)	6	12%
High School	13	26%
Total	**50**	**100%**

Source: SPSS Data Processing Results, 2024

According to Table 3, the majority of respondents hold a Bachelor's degree (S1) (31 individuals or 62%), while a smaller portion have a Diploma (D3), with 6 individuals (12%).

b. Variable Description

1) Information System

Table 4. Respondent Description Based on Information System Variable

Statement	SS	S	N	TS	STS	Total
X1.1: "The existing information system in this company makes it easier for me to obtain information related to K3."	0%	66%	26%	4%	4%	100%
X1.2: "I find the information system in the company easy to access whenever needed."	0%	52%	36%	8%	4%	100%
X1.3: "The information provided by the company's information system is always accurate and up to date."	0%	52%	42%	4%	2%	100%
X1.4: "The company's information system provides information relevant to my job."	0%	60%	38%	0%	2%	100%
X1.5: "The information system facilitates reporting or recording of K3 incidents."	0%	56%	34%	8%	2%	100%

Source: SPSS Data Processing Results, 2024

2) Communication System

Table 5. Respondent Description Based on Communication System Variable

Statement	SS	S	N	TS	STS	Total
X2.1: "The communication system in the company allows me to provide feedback related to K3."	54%	36%	8%	2%	0%	100%
X2.2: "I feel that communication between employees and management regarding K3 runs smoothly."	0%	62%	34%	2%	2%	100%
X2.3: "The company effectively socializes K3 procedures through its communication system."	0%	54%	38%	6%	2%	100%
X2.4: "The communication system in the company allows K3 information to be delivered quickly."	0%	62%	30%	6%	2%	100%
X2.5: "I feel comfortable reporting or filing complaints related to K3 through the existing communication system."	0%	64%	28%	4%	4%	100%

Source: SPSS Data Processing Results, 2024

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3) Effectiveness of K3 Management System

Table 6. Respondent Description Based on the Effectiveness of the K3 Management System Variable

Statement	SS	S	N	TS	STS	Total
Y1: "The K3 management system in the company helps prevent workplace accidents."	0%	68%	28%	0%	4%	100%
Y2: "I feel that the K3 management system in this company is effective in protecting employee health."	0%	62%	30%	6%	2%	100%
Y3: "I have a good understanding of the K3 procedures implemented in the company."	0%	64%	30%	4%	2%	100%
Y4: "The K3 management system in this company increases my sense of security at work."	0%	64%	28%	6%	2%	100%
Y5: "The company always evaluates and improves the implementation of the K3 management system."	0%	62%	30%	6%	2%	100%

Source: SPSS Data Processing Results, 2024

4.1.2 Data Quality and Preliminary Analysis

The data used in this study were obtained through questionnaires distributed directly to employees of PT. Bumi Karsa, Maros Regency. All questionnaires were returned and considered valid for analysis, resulting in a total sample of 50 respondents. The descriptive analysis indicates that respondents generally provided positive responses toward the information system, communication system, and effectiveness of the K3 management system variables.

4.1.3 Main Analytical Results

The descriptive findings reveal that the majority of respondents perceived the information system and communication system implemented by the company positively. Respondents agreed that both systems facilitate access to K3-related information, improve communication effectiveness, and support the reporting process related to occupational health and safety issues.

Furthermore, respondents also demonstrated positive perceptions regarding the effectiveness of the K3 management system. Most respondents agreed that the K3 management system contributes to accident prevention, employee health protection, increased understanding of K3 procedures, and improved workplace safety.

Overall, the findings indicate that the implementation of information systems and communication systems at PT. Bumi Karsa, Maros Regency supports the effectiveness of the Occupational Health and Safety (K3) management system.

4.1.4 Hypothesis Testing Results / Key Findings

The hypothesis testing results in this study were conducted to examine the influence of the information system and communication system on the effectiveness of the Occupational Health and Safety (K3) management system at PT. Bumi Karsa, Maros Regency.

The findings indicate that the information system variable shows a positive contribution to the effectiveness of the K3 management system. Respondents generally agreed that the company's information system facilitates access to K3 information, provides relevant and up-to-date information, and supports the reporting and recording of K3 incidents.

In addition, the communication system variable also demonstrates positive results regarding the effectiveness of the K3 management system. Most respondents agreed that the communication system facilitates smooth communication between employees and management, enables rapid delivery of K3 information, and supports employee feedback and complaint mechanisms related to K3 implementation.

Furthermore, the effectiveness of the K3 management system variable received predominantly positive responses from respondents. Employees perceived that the K3 management system implemented by the company contributes to workplace accident prevention, employee health protection, increased understanding of K3 procedures, and improved workplace safety.

Overall, the results indicate that the

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information system and communication system are associated with the effectiveness of the K3 management system at PT. Bumi Karsa, Maros Regency.

4.1.5 Visual Presentation of Results

Tables 1 to 6 present the demographic characteristics of respondents and the descriptive analysis results for each research variable. The tables were used to improve clarity and readability of the findings by summarizing frequencies and response percentages systematically. Each table is explicitly referenced within the discussion to provide a structured presentation of the empirical results.

4.2 Research Discussion

4.2.1 Interpretation of Key Findings

a. The Influence of Information Systems on the Effectiveness of the OHS Management System at PT. Bumi Karsa, Maros Regency

Based on the regression analysis conducted, interesting insights were found regarding the impact of independent variables on the effectiveness of the Occupational Health and Safety (OHS) management system. One surprising finding is that variable X1 (Information System) does not have a significant effect on variable Y. This indicates that changes in the quality of the information system within the organization are not directly related to improvements in the effectiveness of the OHS management system.

These results suggest that other factors beyond the information system play a more crucial role in determining the effectiveness of the OHS management system. Although information systems are essential elements in modern organizations, their mere presence does not guarantee the successful implementation of an OHS management system. Other factors such as the quality of communication among employees, strong leadership, management commitment to OHS, and an integrated safety culture within the organization may have a more significant influence.

One possible reason why the information system does not show a significant effect is the presence of multicollinearity issues. Multicollinearity occurs when independent variables are highly correlated with each other. In this situation, the high VIF values of both independent variables indicate the possibility of multicollinearity. When multicollinearity occurs, it becomes difficult to determine the individual influence of each independent variable on the dependent variable.

In conclusion, the results of this regression analysis emphasize the importance of not solely focusing on technical aspects such as information systems when attempting to improve the effectiveness of the OHS management system. Although information systems play a significant role, the success of OHS management system implementation heavily depends on various organizational and managerial factors. To enhance the effectiveness of the OHS management system, a comprehensive approach involving all organizational aspects is required, rather than relying solely on technology.

This study aligns with Nguyen, T., & Lee, C. (2018), which found that despite the use of information and communication systems in high-risk sectors such as the oil and gas industry, the outcomes were not always positive. One of the main factors identified was the lack of employee trust in the existing information system for reporting incidents or risks. If employees feel that the information system is unreliable or does not provide clear feedback, they may hesitate to report safety issues, ultimately reducing the overall effectiveness of the OHS management system.

b. The Influence of Communication Systems on the Effectiveness of the OHS Management System at PT. Bumi Karsa, Maros Regency

The results of the regression analysis indicate that variable X2, the Communication System, has a significant impact on variable Y, the Effectiveness of the OHS Management System. This finding suggests that the quality of the communication system within an organization plays a crucial role in enhancing the effectiveness of OHS management system implementation.

The positive impact of the communication system on the effectiveness of the OHS management system can be explained in several ways. First, effective communication allows every employee to understand their roles and responsibilities in maintaining occupational health and safety. Second, efficient communication supports the swift identification and reporting of risks, enabling prompt preventive actions. Third,

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transparent and honest communication fosters a strong safety culture within the organization.

However, it is important to note that the influence of the communication system on the effectiveness of the OHS management system cannot be considered in isolation. Other factors such as leadership, management commitment, and employee participation also play a critical role. A well-functioning communication system will be more effective when supported by strong leadership and a commitment from all levels of the organization to create a safe and healthy workplace.

This study is consistent with previous research by Smith, G., & Lee, J. (2018), which found that effective communication between management and workers significantly influences the implementation of the OHS management system. Their study concluded that good communication, whether direct or through information technology (such as incident reporting platforms and early warning systems), has a positive impact on the enforcement of OHS policies, reduces workplace accidents, and increases worker compliance with safety procedures.

In conclusion, this study underscores the critical contribution of communication systems in improving the effectiveness of the OHS management system. Organizations need to allocate time and resources to develop efficient communication systems, including creating clear communication plans, selecting appropriate communication channels, and training employees to enhance their communication skills. By taking these steps, organizations can establish a safer and healthier work environment for all employees.

4.2.2 Comparison with Previous Studies

The findings of this study are consistent with previous research conducted by Nguyen, T., & Lee, C. (2018), which found that the implementation of information and communication systems in high-risk industries did not always produce positive outcomes. Their study explained that employee distrust toward information systems reduced the effectiveness of incident and risk reporting mechanisms. Employees tended to hesitate in reporting safety-related issues when the system failed to provide reliable feedback or operational transparency. This condition may explain why information systems in the present study did not significantly influence the effectiveness of the OHS management system.

Furthermore, the findings regarding communication systems are in line with Smith, G., & Lee, J. (2018), who concluded that effective communication between management and employees significantly improves OHS management implementation. Their study emphasized that communication channels, including digital reporting systems and early warning mechanisms, contribute positively to policy enforcement, accident reduction, and employee compliance with safety procedures.

However, this study also highlights a distinctive contribution compared to prior studies. While previous studies mainly emphasized the technological dimension of safety systems, this study demonstrates that organizational communication remains a more dominant determinant of OHS management effectiveness than the mere availability of information systems. This finding suggests that technology alone is insufficient without effective interpersonal and organizational communication practices.

4.2.3 Theoretical Contributions

This study contributes theoretically to the development of organizational communication and management system theories within the context of occupational health and safety. The findings confirm that communication systems are essential elements in strengthening organizational coordination, employee awareness, and safety culture, which are central components of effective OHS management systems.

In addition, the insignificant influence of information systems challenges the assumption that technological systems automatically improve organizational effectiveness. The study extends existing theoretical perspectives by emphasizing that the effectiveness of information systems depends on supporting organizational conditions, such as employee trust, leadership quality, communication openness, and managerial commitment.

The findings also reinforce socio-technical system theory, which explains that organizational effectiveness cannot rely solely on technical systems but must be balanced with social and behavioral dimensions. Thus, this study provides empirical evidence that successful OHS management implementation requires integration between

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technological infrastructure and human-centered organizational practices.

4.2.4 Practical and Policy Implications

The findings of this study provide important implications for organizational managers, practitioners, and policymakers, particularly in construction and high-risk industries. First, organizations should not rely exclusively on information systems as a strategy for improving OHS management effectiveness. Instead, companies need to strengthen employee trust in the system by ensuring transparency, responsiveness, and ease of use within safety reporting mechanisms.

Second, management should prioritize the development of effective communication systems. This can be achieved through clear communication procedures, regular safety briefings, open reporting channels, and continuous employee training regarding workplace safety communication. Effective communication will improve coordination, minimize misunderstandings, and encourage employee participation in maintaining occupational safety and health standards.

Third, organizational leaders must actively demonstrate commitment toward workplace safety by creating a supportive safety culture. Policies related to OHS should involve all organizational levels to ensure that safety communication becomes part of daily operational practices. These efforts are expected to reduce workplace accidents and improve overall organizational performance.

4.2.5 Integration with the Research Gap

This study successfully addresses the research gap identified in previous literature concerning the inconsistent findings regarding the role of information systems and communication systems in OHS management effectiveness. Previous studies generally focused more on technological adoption and digital systems as primary determinants of OHS success, while limited studies examined the comparative influence between information systems and communication systems within organizational settings.

The present findings reveal that communication systems have a more significant contribution than information systems in improving OHS management effectiveness. This demonstrates that organizational communication processes remain a critical factor that cannot be replaced solely by technological implementation. Therefore, this study contributes originality by highlighting the importance of balancing technical systems with human interaction and organizational communication in achieving effective OHS management.

4.2.6 Acknowledgement of Study Limitations

Despite providing valuable findings, this study has several limitations that should be considered when interpreting the results. First, the study was conducted only within PT. Bumi Karsa, Maros Regency, which may limit the generalizability of the findings to other industries or organizational contexts with different operational characteristics.

Second, the study focused only on two independent variables, namely information systems and communication systems, while other potentially influential factors such as leadership style, organizational culture, employee competence, and management commitment were not examined comprehensively. These factors may also significantly influence the effectiveness of OHS management systems.

Third, the possibility of multicollinearity among independent variables may have influenced the statistical results, particularly regarding the insignificant effect of information systems. Therefore, future research is encouraged to include broader variables, larger samples, and different organizational contexts to obtain more comprehensive insights regarding factors influencing OHS management system effectiveness.

5. Conclusion

5.1 Summary of Key Findings

The results of this study indicate that information systems have a positive but insignificant effect on the effectiveness of the OHS management system at PT. Bumi Karsa, Maros Regency. This finding suggests that the implementation of information systems alone is insufficient to significantly improve the effectiveness of OHS management without support from other organizational and managerial factors.

In contrast, communication systems were found to have a positive and significant effect on the effectiveness of the OHS management system. Effective communication enables employees to

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better understand safety procedures, work instructions, and potential workplace hazards, thereby supporting the creation of a safer and healthier work environment.

5.2 Theoretical Contributions

This study contributes to the development of knowledge related to occupational health and safety management by emphasizing the importance of communication systems in supporting OHS effectiveness. The findings enrich existing literature by demonstrating that communication plays a more significant role than information systems in influencing the effectiveness of OHS management implementation.

In addition, this study provides empirical evidence that technological systems such as information systems require organizational support, employee involvement, and effective managerial practices to produce meaningful impacts on OHS performance. Therefore, the study extends previous research by highlighting the interaction between technological and organizational dimensions in OHS management systems.

5.3 Practical and Policy Implications

The findings of this study provide several practical implications for PT. Bumi Karsa and other organizations implementing OHS management systems. First, organizations should strengthen communication systems by ensuring that safety-related information is delivered clearly, consistently, and effectively to all employees. Second, it is recommended to conduct daily safety discussions before work activities begin. These discussions can improve employees' understanding of workplace hazards, safe work practices, and other important safety procedures. Third, organizations should provide specialized communication training for supervisors and foremen, particularly regarding effective methods for delivering safety instructions to field workers. Improving communication competence among supervisors can help minimize misunderstandings and increase employee compliance with safety regulations. From a policy perspective, organizations should integrate communication improvement strategies into their OHS management policies to support sustainable workplace safety performance.

5.4 Limitations of the Study

This study has several limitations that should be considered when interpreting the findings. First, the research was conducted only at PT. Bumi Karsa, Maros Regency, which may limit the generalizability of the findings to other organizations or industries with different operational characteristics. Second, the study focused only on information systems and communication systems as determinants of OHS management effectiveness. Other factors such as organizational culture, leadership, employee competence, and safety awareness were not included in the analysis and may also influence OHS effectiveness. Third, the study relied on questionnaire-based responses, which may be subject to respondent bias and differences in individual perceptions regarding the implementation of OHS management systems.

5.5 Directions for Future Research

Future research is recommended to expand the scope of analysis by involving organizations from different sectors and regions to improve the generalizability of the findings. Comparative studies across industries may provide broader insights into factors influencing OHS management effectiveness. Further studies are also encouraged to incorporate additional variables such as leadership style, organizational culture, employee safety behavior, technological readiness, and management commitment to obtain a more comprehensive understanding of OHS management systems.

In addition, future researchers may apply mixed-method or qualitative approaches to explore employee experiences, communication challenges, and organizational dynamics in greater depth. Such approaches could provide richer insights into how organizations can optimize both information systems and communication systems to improve workplace safety performance.

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