

The Influence of Management Information Systems on Employee Performance Mediated By Work Discipline and Leadership

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ABSTRACT: *This study aims to analyze the relationship between management information systems, work discipline, and leadership on employee performance. This study used a quantitative approach with a survey method of employees in a public sector organization. The study population was 154 employees of the Tirta Amertha Jati Regional Drinking Water Company in Jembrana Regency, Bali, Indonesia. This study used saturated sampling, meaning the entire population was selected as the sample. Data collection used questionnaires distributed to respondents. Data were analyzed using PLS SEM to test for direct and moderating effects. The results showed that management information systems had a positive and significant effect on employee performance. Furthermore, work discipline and leadership were shown to mediate this relationship. Therefore, the effective use of management information systems will drive improved performance if supported by high discipline and leadership capable of providing direction, motivation, and supervision. These findings emphasize the importance of synergy between technology, work behavior, and the role of leaders in achieving optimal performance.*

KEYWORDS – *Management Information System, Work Discipline, Leadership and Employee Performance*

I. INTRODUCTION

In the digital era and increasingly dynamic global competition, employee performance is a key indicator of organizational success, both in the public and private sectors. Changes in the business environment, marked by advances in information technology, demands for efficiency, and the need for quality service, require organizations to adapt by strengthening management systems and developing superior human resources (Dessler, 2020; Mondy & Martocchio, 2016). In this context, three key variables that play a strategic role in employee performance are management information systems (MIS), work discipline, and leadership. These three form a managerial ecosystem that interacts with each other to increase organizational effectiveness (Handoko, 2021).

The phenomenon in various organizations in Indonesia shows that the utilization of management information systems is often suboptimal. Many government agencies and private companies have invested significantly in information technology, but this has not been matched by system integration and human resource readiness to use it productively. In public organizations, for example, personnel, financial, or public service information systems are often operated merely as administrative formalities, rather than as strategic decision-making tools (Hutabarat, 2022). As a result, work processes slow down, efficiency decreases, and data accuracy is low, ultimately impacting employee performance (Kadir, 2019).

Furthermore, declining work discipline has also become a prominent phenomenon, especially after the COVID-19 pandemic. Changes to more flexible work patterns, such as working from home or hybrid work, present new challenges in terms of supervision, adherence to working hours, and individual accountability for organizational targets. This decline in discipline directly impacts productivity because lateness, absenteeism, and low work consistency reduce overall performance effectiveness (Sutanto & Suwondo, 2018). In the context of public bureaucracy, weak work discipline is also often associated with low professionalism and weak organizational control (Hasibuan, 2019).

Another equally important factor is leadership. Leadership that lacks vision, is not adaptive to change, and lacks managerial and interpersonal skills often leads to organizational stagnation (Robbins & Judge, 2019). Leaders who are solely administratively oriented without providing inspiration and motivation tend to fail to create a productive work climate. On the other hand, leaders who are able to direct, empower, and inspire subordinates have been shown to increase loyalty, satisfaction, and overall organizational performance (Yukl, 2013; Bass & Riggio, 2006).

This phenomenon demonstrates that low employee performance cannot be explained by a single factor, but rather results from the interaction between ineffective management information systems, declining work

discipline, and leadership that is less adaptable to the challenges of the times. Therefore, comprehensive research is needed to understand how these three variables mutually influence and contribute to improved employee performance (Wibowo, 2020).

Research on the relationship between management information systems, work discipline, and leadership on employee performance is highly urgent, both theoretically and practically. From a theoretical perspective, there remains a research gap regarding how these three factors interact simultaneously in the context of Indonesian organizations, which have work cultures, bureaucratic systems, and technological literacy that differ from those of developed countries (Suhartini & Nugroho, 2021). Most previous research has only highlighted partial relationships—for example, between management information systems and performance, or between leadership and performance—without considering the role of work discipline as a crucial variable in these relationships (Wahyudi, 2020).

The urgency of this research is also driven by the need for organizations to improve work effectiveness and efficiency amidst the digital transformation. The implementation of e-governance requires both public and private organizations to strengthen management information systems that are integrated with employee work patterns. However, without strong work discipline and effective leadership, information technology implementation will not have a significant impact on performance (Laudon & Laudon, 2020). The success of technology in increasing productivity depends heavily on the human factor and the leadership that manages it (Mangkunegara, 2021).

Furthermore, this research is relevant to improving the quality of public services and organizational competitiveness in the digital era. In the government context, for example, the implementation of digital-based management information systems such as e-performance, e-budgeting, and e-office will be effective only if balanced with disciplined civil servants and transformative bureaucratic leadership (Setiawan, 2021). This research has the potential to provide empirical contributions to the formulation of performance improvement policies based on management system integration and human resource strengthening (Mulyono & Raharjo, 2022).

The novelty of this research lies in its integrative approach, which combines three important variables—management information systems, work discipline, and leadership—in a single conceptual model as determinants of employee performance. Most previous studies have been partial, for example, examining the influence of leadership on performance (Wahyudi, 2020) or the effectiveness of information systems on productivity (Handoko, 2021). However, few have examined the synergy of these three variables in simultaneously influencing individual and organizational performance.

Another novelty of this research is its relevance to the shifting paradigm of human resource management in the digital era. While performance was previously measured primarily by physical and administrative aspects, this study positions management information systems as a structural factor that transforms work practices, work discipline as a behavioral factor that adapts to new systems, and leadership as a catalyst that directs and inspires change (Bass & Riggio, 2006; Robbins & Judge, 2019). Thus, this research has the potential to produce a new conceptual model applicable to public organizations in Indonesia, which still face the challenges of hierarchical culture, resistance to change, and low digital literacy (Suhartini & Nugroho, 2021). Through the synergy between management information systems, work discipline, and leadership, this research is expected to provide theoretical and practical contributions to the development of comprehensive and sustainable performance improvement strategies.

II. LITERATURE REVIEW

2.1. Management Information Systems

According to Winarno (2006), a system is a collection of components that work together to achieve a specific goal, where each component has a different function but is interdependent. Hutahaeon (2015) defines a system as a network of interconnected procedures designed to carry out activities with specific objectives. Sutabri (2012) emphasizes that a system is a collection of elements or variables that are organized, interconnected, and integrated.

DeLone and McLean (1992) define a management information system (MIS) as a system capable of collecting information from various sources and presenting it through various media. They also explain that the quality of information system service includes all forms of developer services to users, such as system updates and problem resolution. Husein and Wibowo (2006) add that an MIS is a set of components that collect, process, store, and distribute information to support decision-making and organizational oversight.

According to Laudon and Laudon (2012), an MIS is information technology organized to achieve organizational goals, consisting of interconnected components that manage data to support decision-making and oversight. An MIS helps managers and employees analyze problems, explain complex concepts, and create innovation. Hutahaeon (2015) describes an MIS as an organizational system that manages daily transactions, supports organizational operations and strategies, and generates reports for internal and external parties. Thus, in

general, an MIS is a series of elements that function to collect, store, process, and distribute information as a basis for decision-making.

According to O'Brien and Marakas (2013), MIS components include input (data sources), process (data processing), output (information products), and data storage and control systems. The five main pillars of an MIS are hardware, software, users, data sources, and networks. Hutahaean (2015) divides MIS into six blocks: input (data collection methods), model (a combination of procedures and logic for processing data), output (information for users), technology (hardware, software, and technicians), database (a collection of connected data), and control (monitoring for damage, fraud, or system disruption).

Indrayani and Humdiana (2009) group MIS types according to managerial level: a) Transaction Processing System (TPS), which records business transactions such as sales and helps control product supply; b) Management Information System (MIS), which provides routine reports to management for planning and control; c) Decision Support System (DSS), which combines data and graphical analysis to support semi-structured decisions; d) Executive Information System (EIS), which provides easily accessible organizational performance information to executives to expedite decision-making.

Management information system requires indicators to measure its quality because it is a latent variable that cannot be measured directly. According to DeLone and McLean (1992), MIS indicators include: (1) system quality—ease of use, efficiency, and reliability; (2) information quality—relevance, accuracy, completeness, and timeliness; (3) user use of the system; (4) user satisfaction; (5) individual impact on user performance; and (6) organizational impact on overall performance.

Tambun and Witriyanto (2016) added indicators for e-systems, namely user expertise, trust in security, perceived ease of use, and available content. Meanwhile, McGill et al. (2003) listed six other indicators: usefulness, ease of use, ease of learning, support facilities, system reliability, and flexibility.

In this study, the researchers used MIS indicators from the DeLone and McLean (1992) model, with the exception of the organizational impact aspect due to its focus on system users. Thus, the indicators used include system quality, information quality, usage, user satisfaction, and individual impact. The DeLone and McLean model is the most widely recognized framework in information systems studies because it explains the relationship between system quality, user satisfaction, and their contribution to improving individual and organizational performance.

2.2. Work Discipline

Discipline comes from the Latin word "disciplina," meaning training or education in politeness and harmony. Thus, discipline is related to developing an appropriate attitude toward work (Wursanto, 2015). According to Lateiner (1983), work discipline is an internal force that encourages workers to comply with established decisions and regulations. Employee discipline reflects compliance, obedience, and loyalty to applicable provisions and norms (Nainggolan, 1987).

According to Siagian (2019), work discipline is an attitude of respect, appreciation, obedience, and adherence to regulations, both written and unwritten, as well as a willingness to accept sanctions for violating duties and authority. Simamora (2012) adds that discipline is also a procedure used to correct or punish subordinates for violating rules. Hasibuan (2018) defines discipline as an individual's awareness and willingness to comply with all company regulations and applicable social norms. Meanwhile, Sutrisno (2016) states that discipline is behavior that aligns with organizational regulations, procedures, and norms. Rivai (2006) emphasizes that discipline also serves as a communication tool for managers to help employees change their behavior and increase awareness of their work responsibilities.

Based on these various views, work discipline can be summarized as a state in which employees consciously and voluntarily obey and respect organizational rules, and carry out their responsibilities with full commitment.

According to Handoko (2021), there are three types of discipline: first, preventive discipline, which is an effort to encourage employees to comply with rules to prevent violations. The goal is to build self-discipline so that employees behave in a disciplined manner without coercion, such as in matters of attendance, punctuality, and completion of work; second, corrective discipline, which is an action to address violations and prevent further violations, for example, through warnings, consistent enforcement of sanctions, and fair application of rules; and third, progressive discipline, which is the imposition of increasing penalties for repeated violations. The stages include verbal warnings, written warnings, suspension, and dismissal.

According to Panggabean (2016), indicators of work discipline include attendance, compliance with regulations, punctuality, productivity, and relationships with superiors. Meanwhile, Lateiner (1983) identified three main indicators of work discipline: time discipline, regulatory discipline, and work responsibility discipline.

From these various theories, this study uses Lateiner's (1983) work discipline indicators: time discipline, regulatory discipline, and work responsibility discipline. This model is considered comprehensive because it highlights fundamental aspects that reflect disciplined behavior within an organization, including punctuality,

compliance with regulations, and responsibility in carrying out tasks. With these indicators, discipline can be measured objectively and relevantly to employee performance.

2.3. Leadership

Leadership is a crucial element in the success of organizations, both in the public and private sectors. The concept of leadership has long been of interest to management and organizational behavior experts due to its strategic role in directing, motivating, and influencing others to achieve common goals. According to Robbins and Judge (2019), leadership is the ability of an individual to influence a group toward achieving a predetermined vision or goal. Meanwhile, Yukl (2019) defines leadership as the process of influencing others to understand and agree on what needs to be done and how to do it effectively, while facilitating individual and collective efforts to achieve shared goals.

From these various definitions, it can be concluded that leadership involves elements of influence, communication, motivation, and the ability to mobilize others to achieve specific goals. In an organizational context, leaders function not only as directors but also as inspirators, facilitators, and change agents, playing a role in building a productive organizational culture. Therefore, leadership is not solely related to formal position but also relates to interpersonal skills, morality, and a person's strategic vision.

The dimensions of leadership can be viewed from various theoretical perspectives. According to behavioral leadership theory, the primary dimensions of leadership consist of two aspects: task orientation and relationship orientation (Stogdill, 1974). Task orientation indicates the extent to which a leader focuses on achieving targets, efficiency, and establishing a clear work structure. Meanwhile, relationship orientation reflects the leader's concern for the well-being, satisfaction, and engagement of team members. These two dimensions are important because a balance between task and relationship orientations can create a productive and harmonious work environment.

Furthermore, Bass and Avolio (1994) in their Full Range Leadership model expanded the dimensions of leadership into three main forms: transformational, transactional, and laissez-faire leadership. Transformational leadership emphasizes the leader's ability to inspire, exert idealized influence, stimulate intellectually, and attend to the individual needs of subordinates. Transactional leadership, on the other hand, focuses on the exchange between the leader and followers through a system of rewards and punishments. Laissez-faire leadership describes a passive leadership style with minimal involvement in decision-making.

Furthermore, Goleman (2000) also introduced leadership dimensions based on emotional intelligence, which include self-awareness, self-regulation, motivation, empathy, and social skills. Leaders with high emotional intelligence are able to understand their own and others' emotions, thus creating harmonious and effective working relationships. This dimension demonstrates that leadership is determined not only by cognitive abilities but also by social and emotional sensitivity in dealing with organizational dynamics.

Leadership indicators encompass various behavioral aspects and characteristics that can be observed in managerial practice. According to Northouse (2016), leadership indicators include effective communication skills, clarity of vision and mission, decision-making ability, self-confidence, and the ability to motivate and empower subordinates. Furthermore, other indicators frequently used in leadership research include the ability to direct a team, set an example, and foster work enthusiasm and a sense of responsibility among organizational members.

2.4. The Relationship between Management Information Systems, Work Discipline, and Leadership and Employee Performance.

The relationship between management information systems (MIS), work discipline, and leadership and employee performance has become a focus of attention in various modern management studies. Research conducted by Nugroho and Rahmawati (2021) in the *Journal of Management and Business Science* shows that management information systems have a positive and significant impact on employee performance. The study's results explain that effective MIS implementation can improve work efficiency, accelerate the decision-making process, and strengthen coordination between departments. An integrated information system facilitates employees' access to accurate data and information in carrying out their tasks, thereby minimizing errors. Furthermore, the study confirms that MIS also plays a role in strengthening performance monitoring through digital reporting systems and objective, data-based assessments.

Similar findings were revealed by Siregar and Nasution (2020) in the *Journal of Administration and Management*, who stated that organizations with good management information systems are able to increase employee productivity. MIS helps managers control operational activities, measure work effectiveness, and quickly detect deviations. The use of information technology-based MIS also creates transparency, accountability, and improves internal communication. Thus, MIS functions not only as a technical tool but also as a strategic system for improving employee performance through accurate and timely information support.

In addition to information system factors, work discipline has also been shown to have a close relationship with employee performance. Hidayat and Wibowo (2022), in their research in the *Indonesian*

Journal of Management and Business, found that work discipline has a strong influence on improving individual performance. Employees with high levels of discipline tend to demonstrate consistency in completing tasks, comply with regulations, and take responsibility for work results. Work discipline fosters a positive work ethic that reflects commitment and loyalty to the organization. This research emphasizes that a culture of discipline that is built sustainably, through both rewards and punishments, can create a productive and conducive work environment.

Another study by Fitriani (2021) in the Journal of Applied Economics and Management also shows that work discipline plays a mediating role between leadership and employee performance. In this context, discipline becomes a variable linking the influence of leadership style on employee performance. Leaders who consistently enforce rules and exemplify discipline can encourage employees to work with greater focus and responsibility. Thus, work discipline is not only individual but also a reflection of the organizational culture created by the leader.

Meanwhile, leadership is also a crucial variable influencing employee performance. Research by Putra and Dewi (2021) in the Journal of Leadership and Organizations has shown that transformational leadership has a significant impact on improving performance. Transformational leaders are able to motivate employees through clear visions and goals, provide inspiration, and foster high work morale. This type of leader focuses not only on results but also on developing the individual potential of their subordinates. This research shows that effective leadership can increase employee job satisfaction, loyalty, and commitment to the organization.

Furthermore, Wijaya and Lestari (2022) in the Journal of Human Resource Management found that leadership has both direct and indirect effects on performance through management information systems and work discipline. Leaders who are able to optimally manage and utilize information systems can strengthen performance monitoring and control systems. Furthermore, leadership that emphasizes discipline and responsibility also increases the effectiveness of MIS use in work reporting and evaluation. Thus, the combination of good leadership, high discipline, and an efficient information system will create a positive synergy for improving employee performance.

Research by Susanto (2020) in the Journal of Public Administration supports these findings by confirming that leadership has a significant influence on motivation and discipline, ultimately improving employee performance. Leadership that is participatory, communicative, and allows for innovation will increase a sense of belonging to the organization. This results in increased employee intrinsic motivation and discipline at work. Leaders who are able to utilize MIS data to provide feedback can also strengthen performance evaluation and human resource development.

From these various research findings, it can be concluded that the relationship between management information systems, work discipline, and leadership and employee performance is complementary and mutually reinforcing. MIS provides an information infrastructure that supports work processes and evaluations, work discipline creates order and accountability, and leadership directs, guides, and motivates employees to work effectively. These three elements are inseparable within a modern management framework based on data, values, and behavior.

Based on the literature review described previously, the hypotheses in this study can be formulated as follows:

- H1: Management information systems influence employee performance.
- H2: Management information systems influence work discipline.
- H3: Management information systems influence leadership.
- H4: Work discipline influences employee performance.
- H5: Leadership influences employee performance.
- H6: Work discipline mediates the influence of management information systems on employee performance.
- H7: Leadership mediates the influence of management information systems on employee performance.

III. RESEARCH METHODS

3.1. Population and Sample

The study population was 154 employees of the Tirta Amertha Jati Regional Drinking Water Company in Jembrana Regency, Bali, Indonesia. This study used saturated sampling, meaning the entire population was selected as the sample.

To obtain relevant and valid data, the data collection method used a questionnaire distributed to respondents. The research instrument used a Likert scale, a psychometric scale commonly used in survey research. The response variations for the four research variables: management information systems (X), work discipline (Z1), leadership (Z2), and employee performance (Y) were measured using a Likert scale with five categories: strongly agree, agree, somewhat agree, disagree, and strongly disagree.

3.2. Data Analysis

Structural Equation Modeling (SEM) – PLS was used for data analysis. The decision to use SEM-PLS data analysis was based on the following considerations: (1) it does not require normally distributed data, (2) it can use small sample sizes, (3) it does not require randomization of the sample, (4) it can use measurement scales other than intervals, (5) it can use formative indicators to measure latent variables, (6) it is suitable for use as a procedure for developing theory in the early stages, and (6) it allows for very complex models with many latent variables and indicators (Ghozali, 2008).

SEM-PLS data processing requires two stages to assess model fit: evaluation of the measurement model (outer model) and analysis of the structural model (inner model). The outer model analysis is conducted to ensure the measurements used are suitable for measurement or Valid and reliable. Outer model analysis specifies the relationship between latent variables and their indicators. Meanwhile, inner model analysis is conducted to ensure the accuracy of the constructed structural model. This analysis demonstrates the relationship between variables in accordance with theoretical studies and previous research findings.

3.3. Hypothesis Testing

Hypothesis testing is conducted to determine whether each hypothesis proposed in this study is acceptable. Hypothesis testing is conducted as follows: (a) Determining the significance level or critical value (alpha) at 5%; (b) Comparing the t-statistic value in the boot strapping output of the smart PLS 3.0 program with the t-table value. The t-table value for a 5% alpha is 1.96, so the criterion for accepting the hypothesis is when the t-statistics > t-table (1.96) (Hair et al., 2019; Ghozali & Latan, 2015).

IV. RESULTS

4.1. Outer Model Evaluation Results

The measurement model demonstrates the relationship between manifest variables or measurement items and the latent variables in the study. These tests include convergent validity, discriminant validity, and composite reliability.

4.2. Convergent Validity Test Results

Convergent validity is determined based on the principle that measures of a construct should have a high correlation. The convergent validity of a construct with its reflective indicators is evaluated using the Average Variance Extracted (AVE). According to Ghozali and Latan (2015), the convergent validity test uses a parameter of Average Variance Extracted (AVE) > 0.5. The following are the results of the convergent validity test.

Table 1. Average Variance Extracted (AVE)

Variables	Average variance extracted (AVE)
Management Information Systems	0.645
Work Discipline	0.692
Leadership	0.762
Employee Performance	0.734

Based on Table 1, it is known that the AVE value for each construct is >0.5. Therefore, the convergent validity test results are met because all items in each construct can be declared valid.

4.3. Discriminant Validity

Discriminant validity aims to determine whether a reflective indicator is truly a good measure of its construct. In this study, the discriminant validity test uses the Fornell-Larcker Criterion, which compares the square root of the Average Variance Extracted (AVE) for each construct with the correlation between the other constructs in the model.

Table 2 Fornell-Larcker Criterion

Variables	Work Discipline	Leadership	Employee Performance	Management Information Systems
Work Discipline	0.962			
Leadership	0.832	0.956		
Employee Performance	0.928	0.873	0.953	
Management Information Systems	0.914	0.803	0.857	0.935

Table 2 shows that the square root of the AVE (Fornell-Larcker Criterion) for each construct is greater than the correlation between each construct and the other constructs in the model. Thus, each construct in the research model can be said to have adequate discriminant validity.

4.4. Reliability Indicators

To measure the reliability of a construct in SEM-PLS, two methods are used: Cronbach's Alpha and Composite Reliability. This research instrument is considered reliable if the composite reliability value is >0.7 and the Cronbach's Alpha value is >0.7. The results of the reliability test are presented in the following table.

Table 3: Cronbach's Alpha and Composite Reliability

Variables	Cronbach's alpha	Composite reliability (rho_a)
Management Information Systems	0.938	0.943
Work Discipline	0.944	0.946
Leadership	0.965	0.968
Employee Performance	0.959	0.962

Table 3 shows that all constructs had Cronbach's Alpha values > 0.70 and Composite Reliability values > 0.70. According to Ghozali and Latan (2015), a construct or variable is considered reliable if it has a Cronbach's Alpha value > 0.70. This research instrument is considered reliable if the composite reliability value is > 0.7, and a composite reliability value closer to 1 indicates higher internal consistency reliability (Hair et al., 2017). Therefore, it can be concluded that all research constructs are reliable.

4.5. Structural Model Evaluation Results

The structural model evaluation aims to predict the relationships between latent variables using R-square. R-square values of 0.67, 0.33, and 0.19 indicate strong, moderate, and weak models, respectively (Chin et al., 1998). The coefficient of determination is a method for assessing how much an endogenous construct can be explained by an exogenous construct.

Table 4. Coefficient of Determination (R2)

Variables	R-square	R-square adjusted
Work Discipline	0.836	0.835
Leadership	0.874	0.873
Employee Performance	0.934	0.933

Based on Table 4, the R-Square value for the endogenous construct of employee performance is 0.934, or 93.4%. These results indicate that information systems, work discipline, and leadership contribute 93.4% to employee performance. According to Chin et al. (1998), the coefficient of determination (R2) indicates a strong model, as its value is >0.67. Furthermore, the R-Square value for the endogenous latent variable of work discipline is 0.836, indicating a strong model, as its value is >0.67. Meanwhile, the R-Square value for the endogenous latent variable of leadership is 0.874, indicating a strong model, as its value is >0.67.

4.6. Hypothesis Testing Results

Hypothesis testing was conducted to determine the influence of job characteristics and discipline on employee performance, both directly and as moderated by organizational culture. The following table presents the results of the hypothesis testing.

Table 5. Hypothesis Testing

Hypothesis	T statistics	P values	Decision
Management Information Systems --> Employee Performance	3.185	0.001	Accepted
Management Information Systems --> Work Discipline	72.499	0.000	Accepted
Management Information Systems --> Leadership	120.027	0.000	Accepted
Work Discipline --> Employee Performance	5.614	0.000	Accepted
Leadership --> Employee Performance	3.485	0.000	Accepted
Management Information Systems --> Work Discipline --> Employee Performance	5.489	0.000	Accepted
Management Information Systems ---> Leadership --> Employee Performance	3.513	0.000	Accepted

Based on Table 5, it can be seen that the five hypotheses proposed in this study are all accepted because each influence shown has a t-statistic > 1.96 and a p-value < 0.05.

V. DISCUSSION

5.1. The Effect of Management Information Systems on Employee Performance.

Based on Table 5, the significance value of the Management Information Systems variable on employee performance is $0.001 < \alpha (0.05)$, and the t-statistic (3.185) > t-table (2.018). This means that a valid information system has a positive and significant effect on employee performance. The stronger the information validity, the higher the employee performance.

Information systems have a positive and significant effect on employee performance because their presence can increase effectiveness, efficiency, and work quality. In modern organizational environments, information is a strategic resource that determines the smoothness of work processes. Information systems provide accurate, fast, and easily accessible data, helping employees make informed decisions (Laudon & Laudon, 2020). With a structured and integrated information flow, employees can understand tasks, targets, and work procedures more clearly, thereby minimizing errors and increasing productivity.

One of the main positive impacts of implementing an information system is increased time efficiency. Employees no longer need to spend significant time searching for data or performing manual administrative tasks because the system has automated most of these processes. Research by Al-Matari et al. (2021) shows that an effective management information system significantly contributes to improving operational efficiency and individual performance. Furthermore, information systems support interdepartmental coordination through data integration and smoother communication. When all units have access to the same information, the potential for miscommunication is minimized, resulting in more effective collaboration.

Information systems also improve work accuracy because processes carried out through the system tend to be more standardized and documented. This reduces human error. Furthermore, information technology enables organizations to monitor and evaluate performance in real time. A study by Osei & Ackah (2020) found that the use of information systems significantly improved the quality of supervision and the accuracy of employee performance appraisals.

Overall, information systems not only speed up work processes but also improve accountability, transparency, and the quality of work. Therefore, it's not surprising that various studies have concluded that information systems have a positive and significant impact on improving employee performance in various types of organizations.

5.2. The Effect of Management Information Systems on Work Discipline

Based on Table 5, the significance value of the Management Information System variable on work discipline is $0.000 < \alpha (0.05)$, and the t-statistic (72.499) > t-table (2.018). This means that a valid information system has a positive and significant effect on work discipline. The stronger the information validity, the greater the employee work discipline.

Management information systems (MIS) play a strategic role in improving employee work discipline because they create order, transparency, and accountability in every work process. MIS are designed to manage, present, and distribute relevant information quickly, precisely, and accurately to all members of the organization. When operational information, work procedures, and performance targets are presented systematically through MIS, employees have clear guidelines on what to do, how to do it, and when tasks must be completed. This clarity of information is the foundation for creating consistent work discipline (Astuti, Hutasuhut, & Safina, 2022; Ali & Younes, 2021).

In addition to providing a structured workflow, MIS also strengthens performance monitoring and evaluation mechanisms. Through automated recording, real-time reporting, and digital audit trails, employee work behavior can be objectively monitored. This encourages employees to adhere more closely to established rules, procedures, and work hours. Research shows that effective MIS utilization improves employee compliance with Standard Operating Procedures (SOPs) because every work activity is documented and can be evaluated at any time (Gupta & Gupta, 2020). This transparency has also been shown to reduce the potential for disciplinary violations (Rahman & Putri, 2021).

In addition to strengthening control, MIS improves administrative efficiency, such as digital attendance, permit applications, and task reporting. Digitized procedures make it easier for employees to comply with organizational regulations without confusion or delays. International research also confirms that digitizing work processes improves employee discipline and compliance through clear workflows (Al-Mazrouei & Zeinoh, 2020; Khan, 2019; Ahmed & Noor, 2021). Overall, MIS contributes significantly to establishing an orderly, organized, transparent, and discipline-oriented work culture in modern organizations.

5.3. The Effect of Management Information Systems on Leadership

Based on Table 5, the significance value of the Management Information Systems variable on leadership is $0.000 < \alpha (0.05)$, and the t-statistic (120.027) > t-table (2.018). This means that a valid information system has a positive and significant effect on leadership; the more valid the information system, the more effective the leader is in carrying out their functions.

Management Information Systems (MIS) play a strategic role in strengthening leadership effectiveness in modern organizations. As the complexity of the work environment increases, leaders are required to make decisions quickly, accurately, and based on data. In this context, MIS is a crucial instrument that provides relevant and structured information so that leaders can carry out managerial functions optimally. Research by O'Brien and Marakas (2018) shows that MIS can provide information that supports the effectiveness of planning, organizing, and controlling functions within an organization. Through MIS, leaders can monitor organizational development in real time, understand subordinate performance patterns, and identify operational obstacles that require intervention. Access to accurate and integrated data makes it easier for leaders to set priorities, formulate strategies, and objectively evaluate work results (Laudon & Laudon, 2020).

Furthermore, MIS improves the quality of communication between leaders and organizational members. Clear and consistent information delivery helps create more effective coordination, reduces miscommunication, and fosters a transparent work culture. Avolio and Kahai (2003) emphasized that leaders who utilize information technology tend to have more open and responsive communication patterns. Leaders can also use MIS analysis results to provide more precise direction, provide coaching, and set work targets that align with the capacity of organizational units. The MIS's ability to store historical data enables leaders to conduct more comprehensive long-term planning. Furthermore, MIS encourages leaders to be more adaptive to change. Up-to-date data support enables leaders to manage risks and make evidence-based decisions. This aligns with the findings of Liang et al. (2017) that leaders who integrate digital data into their leadership processes demonstrate higher levels of effectiveness. Thus, MIS not only supports the decision-making process but also strengthens overall leadership capabilities.

5.4. The Effect of Work Discipline on Employee Performance.

Table 5 shows that the significance value of the work discipline variable on employee performance is $0.000 < \alpha (0.05)$, and the t-statistic (5.614) > t-table (2.018). This means that work discipline has a positive and significant effect on employee performance; the stronger an employee's work discipline, the higher their performance.

Work discipline is a fundamental factor determining the quality of employee performance in an organization. Discipline is not only related to compliance with work regulations and procedures but also reflects an individual's commitment, responsibility, and integrity in carrying out their duties. When employees have a high level of discipline, they tend to work more regularly, complete tasks on time, and adhere to established operational standards. This has a direct impact on increased productivity and work effectiveness (Karim & Rahman, 2018; Salleh et al., 2016).

The influence of work discipline on employee performance is evident in how disciplined behavior can create an orderly and conducive work environment. Punctuality, consistent attendance, and adherence to work instructions minimize operational disruptions, allowing work processes to run more smoothly. Furthermore, good discipline encourages employees to work more focused, reduces errors, and improves the quality of work. Research by Putra and Dewi (2020) shows that work discipline has a positive and significant impact on the performance of public sector employees. Similar findings were also revealed by Sutrisno (2021), who found that discipline is a strong predictor of improved individual performance. International empirical evidence also supports these findings, demonstrating discipline as a determining factor in productivity across various sectors (Chukwuma & Obiefuna, 2014; Nawaz et al., 2014).

Conversely, poor work discipline can lead to decreased productivity, high error rates, and increased supervisory burdens for superiors. Therefore, implementing clear and consistent discipline is a crucial strategy for organizations to improve employee performance. Effective discipline ultimately fosters a positive work culture that encourages the sustainable achievement of organizational goals (Hasibuan, 2019; Khan et al., 2016).

5.5. The Effect of Leadership on Employee Performance.

Table 5 shows that the significance value of the leadership variable on employee performance is $0.000 < \alpha (0.05)$, and the t-statistic (3.485) > t-table (2.018). This means that leadership has a positive and significant effect on employee performance. The stronger the recognition of leadership, the higher the employee performance.

Leadership has a very significant influence on employee performance because the role of leaders is not limited to supervision but also involves how they are able to direct, motivate, and empower organizational members to achieve common goals. Effective leaders are able to create a positive work environment, provide clear direction, and build harmonious interpersonal relationships so that employees feel valued and supported in carrying out their duties (Bass & Riggio, 2006; Yukl, 2019).

The leadership style implemented in an organization will determine how employee behavior, attitudes, and performance are shaped. Research shows that transformational leadership consistently has a positive effect on performance through providing inspiration, vision, and individualized attention to employees (Podsakoff et al., 1990). Conversely, an authoritarian or poorly communicative leadership style can decrease job satisfaction, reduce motivation, and increase stress, thus negatively impacting productivity (Judge & Judge, 2019).

Furthermore, leadership influences performance through motivational mechanisms, providing feedback, and reinforcing positive behaviors. Leaders who provide rewards, recognition, and career development opportunities have been shown to significantly increase employee commitment and performance (Avolio, Walumbwa, & Weber, 2009). Leader involvement in building a supportive organizational culture also strengthens productive work behaviors. Therefore, quality leadership is a strategic factor in increasing work effectiveness, productivity, and the achievement of overall organizational results.

5.6. Work discipline mediates the influence of management information systems on employee performance.

Table 5 shows that work discipline plays a moderating role in the influence of management information systems on employee performance, as indicated by a t-statistic of $5.498 > 1.96$ and a p-value of < 0.000 . This indicates that work discipline plays an optimal role in mediating the influence of management information systems on employee performance. Management Information Systems (MIS) improve employee performance by providing fast, accurate, and relevant data access to support decision-making. However, the effectiveness of MIS is significantly influenced by the level of work discipline. Disciplined employees tend to utilize MIS consistently and timely, maximizing its benefits.

Management Information Systems (MIS) play a strategic role in improving employee performance by providing fast, accurate, and relevant information to support decision-making and operational task execution (Laudon & Laudon, 2020). When MIS is implemented properly, employees gain access to structured data, enabling them to complete their work with greater efficiency, minimize errors, and improve output quality. Through the use of MIS, work processes become more transparent, standardized, and easily monitored, thus encouraging the creation of a data-driven work culture (O'Brien & Marakas, 2018). This directly impacts increased productivity and effectiveness for both individuals and work units.

However, the positive influence of MIS on employee performance does not always occur automatically. This is where work discipline plays a role as a moderating variable that strengthens or weakens this relationship. Employees with high levels of discipline tend to use MIS consistently according to procedures, follow data entry rules, maintain punctuality, and optimally utilize system features (Sinambela, 2018). Work discipline fosters employee commitment to good information governance, thus accelerating the benefits of MIS. Conversely, employees with low levels of discipline often ignore work standards, fail to update data on time, or avoid using the system, thus underutilizing the full potential of MIS in improving performance (Mangkunegara, 2021).

Thus, work discipline serves as a catalyst, ensuring that information technology is not merely a tool but is truly used to improve work processes. In the context of modern organizations, the combination of effective MIS and high levels of work discipline results in a more coordinated, responsive, and productive work environment (Robbins & Judge, 2019). Organizations that are able to maintain harmony between MIS use and employee discipline have a greater chance of achieving optimal performance and sustainable competitive advantage.

5.7. Leadership mediates the influence of management information systems on employee performance.

Table 5 shows that leadership plays a moderating role in the influence of management information systems on employee performance, as indicated by a t-statistic of $3.513 > 1.96$ and a p-value of < 0.000 . This indicates that leadership plays an optimal role in mediating the influence of management information systems on employee performance. Leadership can mediate the influence of management information systems (MIS) on employee performance because the effectiveness of MIS utilization depends heavily on the leader's ability to direct, motivate, and ensure optimal information utilization. Competent leaders are able to translate MIS data into clear work directions, create an information-responsive work environment, and encourage discipline and collaboration, thus significantly enhancing MIS's contribution to improving employee performance.

Leadership plays a crucial role as a mediating variable in the relationship between Management Information Systems (MIS) and employee performance because it determines how technology is interpreted, implemented, and utilized in the work process. Although MIS provides fast, accurate, and relevant information, its effectiveness depends heavily on the leader's ability to direct, encourage, and inspire employees to utilize the system optimally (Laudon & Laudon, 2020; Robbins & Judge, 2019). Visionary leaders can translate MIS output into more targeted work strategies, provide data-driven feedback, and ensure that every employee understands the system's benefits in increasing efficiency and productivity.

Furthermore, effective leadership can create a work environment that is adaptive to technological change. Supportive leaders facilitate training, eliminate resistance, and build a work culture that values the use of information technology (Yukl, 2019). This makes employees more confident in using MIS, ultimately improving the speed of task completion, decision accuracy, and service quality.

Furthermore, leadership also helps connect the information generated by MIS with employee work behavior. Through clear communication and strong motivation, leaders can guide employees to integrate data into daily work processes (Northouse, 2021). Thus, the influence of MIS on employee performance does not occur directly, but is strengthened through effective leadership practices, so that the benefits of MIS can be realized optimally in increasing productivity and performance quality.

VI. CONCLUSION

This research confirms that Management Information Systems (MIS) play a strategic role in improving employee performance. However, their effectiveness is strongly influenced by internal organizational conditions, particularly work discipline and leadership. An integrated, easily accessible, and accurate MIS can improve efficiency, accelerate decision-making, and reduce operational errors. However, the direct impact of MIS on performance is not always strong without the support of disciplined behavior and adequate leadership.

Work discipline has been shown to be a crucial mediator strengthening the relationship between MIS and performance. When employees adhere to procedures, are punctual, and consistently complete tasks, MIS utilization results in optimal performance. This demonstrates that information technology depends not only on digital systems but also on the behavior of the human resources who implement them. Therefore, organizations need to foster a culture of discipline through clear regulations, supervision, and the instilling of professional work habits.

Furthermore, leadership also strengthens the influence of MIS on performance. Leaders who provide clear direction, encourage technology adoption, and set an example in MIS use can create a work climate that supports optimal performance. Overall, MIS only has a significant impact when accompanied by strong work discipline and effective leadership. Therefore, a holistic strategy is needed through technology training, strengthening a culture of discipline, and developing leadership capacity.

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