

**THE INFLUENCE OF COMPETENCE, WORK CULTURE, AND WORK
INFRASTRUCTURE ON INVESTIGATION PERFORMANCE THROUGH THE
IMPROVEMENT OF HUMAN RESOURCE QUALITY AT THE BELAWAN
HARBORMASTER AND MAINPORT AUTHORITY OFFICE**

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ABSTRACT

This study aims to analyze the influence of competence, work culture, and work infrastructure on investigative performance, with improving the quality of human resources (HR) as an intervening variable at the Belawan Harbormaster and Main Port Authority Office. The study was conducted at the Belawan Harbormaster and Main Port Authority Office on Jalan Deli, Medan Belawan District, from late June 2025 to August 2025. The study population consisted of 244 employees, and the sample was obtained using the Slovin formula, resulting in 151 respondents. The research method used a quantitative approach and was analyzed using a structural equation model.

The results showed that work culture did not significantly influence investigative performance, but significantly influenced the improvement of human resource quality. Competence significantly influenced both investigative performance and human resource quality improvement. Work infrastructure significantly influenced both investigative performance and human resource quality improvement. Furthermore, improving human resource quality proved to be the variable with the most dominant influence on improving investigative performance. Indirectly, work culture, competence, and work infrastructure significantly influenced investigative performance through improving human resource quality, thus all mediation hypotheses were accepted. The research findings confirm that improving human resource quality is a key determinant in optimizing investigative performance, which can be strengthened through adequate technical competency, a conducive work culture, and adequate work infrastructure. This research provides practical implications: maritime investigation organizations need to prioritize human resource development as a primary strategy for improving investigative performance effectiveness.

Introduction

The increasingly complex development of the shipping world and port activities in Indonesia demands that port management institutions continuously improve service quality and supervision. One of the strategic agencies that plays an important role in regulating and supervising maritime activities is the Harbormaster and Port Authority Office (KSOP), specifically the Belawan Main KSOP Office. This office is tasked with overseeing shipping safety, the smooth flow of goods and passengers, and handling various violations that occur in the port environment through investigation processes. In the context of law enforcement in the shipping and port sector, investigators play a vital role in following up on findings of legal violations and ensuring that the investigation process runs according to laws and regulations. However, in practice, the performance of investigations within the KSOP environment still faces various challenges, such as slow investigation processes, suboptimal case documentation, and low stakeholder satisfaction with supervisory services. This problem is suspected to be closely related to several internal organizational factors that are not yet optimal, including HR competence, work culture, and the completeness of work infrastructure.

HR competence is a fundamental element in supporting the implementation of investigative duties. An investigator must have technical abilities, a strong understanding of the law, communication skills, and sensitivity to operational dynamics in the field. Low competence will hinder investigators in conducting accurate and objective investigations and impact the slowness of legal decision-making. Therefore, improving competence through training, certification, and career development is a necessity in building the professionalism of investigator HR within the KSOP environment.

Furthermore, work culture also becomes a factor that influences productivity and performance quality. A positive work culture is characterized by the presence of values of discipline, teamwork, commitment, and responsibility in completing tasks. In bureaucratic environments, work culture is often influenced by rigid organizational structures, weak leadership, and minimal intrinsic motivation. An unhealthy work culture can lead to internal conflicts, lack of coordination, and a decline in work ethic. Therefore, reforming work culture is an important step in creating a work environment that supports improving investigator performance.

In addition, work infrastructure contributes significantly to the smoothness of operational tasks, including investigations. Infrastructure includes office facilities, information technology, documentation equipment, operational vehicles, and communication access that supports investigator mobility. In some cases, infrastructure limitations cause obstacles in evidence collection, delays in reporting, to reduced accuracy of investigation data. The mismatch between workload and available infrastructure will cause inefficiency in task execution and directly impact investigator work results.

Through identification of the three main variables, namely HR competence, work culture, and work infrastructure, this research attempts to answer the main problem regarding how these three aspects simultaneously and partially influence investigation performance at the Belawan Harbormaster and Main Port Authority Office. Furthermore, this research is also directed at providing strategic input for improving organizational quality, which includes structural aspects, resources, and public service management processes in the maritime sector. In an era of bureaucratic reform that demands transparent,

accountable, and professional performance, institutions like KSOP are required to continuously improve and innovate. Improving service quality and effective law enforcement become the main benchmarks in building public trust and realizing competitive port governance. Therefore, this research is important to be used as a basis for strategic decision-making in order to improve investigator performance, while strengthening the role of the Belawan Main KSOP as the frontline in supervising the national port and shipping sector.

The phenomenon in this research is as follows: Despite the Belawan Main Harbormaster and Port Authority Office (KSOP) having an important role in shipping supervision and law enforcement, in reality investigation performance is still not optimal. This is reflected in the still existing delays in handling violation cases, lack of coordination between work units, and limitations of supporting investigation facilities. In addition, several investigators do not yet have adequate competence and technical skills, and a work culture that does not fully support efficiency and professionalism. This phenomenon indicates the need for an evaluation of internal factors that influence investigation performance as an effort to improve service quality within the Belawan Main KSOP environment.

The Belawan Main Harbormaster and Port Authority Office (Belawan KSOP) has strategic functions in shipping safety activities, ship supervision, enforcement of port regulations, and the investigation process of maritime violations. In carrying out investigative duties, employees are needed who have technical competence, a professional work culture, and adequate work infrastructure support so that the quality of investigation results and organizational performance can be optimal. However, field conditions show a phenomenon indicating that investigation performance is not fully optimal. This is seen from the investigation dossier preparation process that takes longer when handling certain violations, differences in output quality among investigators, and irregularities in investigation administration handling. This phenomenon raises the suspicion that the factor of investigator competence is one of the causes, especially related to technical ability in port law enforcement, rule interpretation, and ability in the evidence process.

Besides competence, there is a phenomenon related to internal work culture. The ideal work culture in the investigation process should emphasize discipline, procedural compliance, professionalism, and integrity. But in reality, employee perceptions of work culture are not homogeneous. There are employees who have high work ethic, but others still show fluctuating discipline, including in terms of punctuality and compliance with investigation SOPs. This condition has the potential to affect the consistency of investigation quality. Another emerging factor is work infrastructure, both physical facilities, digital support systems, and technical work equipment. Some investigation workspaces and documentation facilities are still not optimally organized, the investigation document archiving system is not fully digital, and case evidence support equipment is not adequate to support certain examinations. This lack of infrastructure has the potential to hinder work effectiveness and slow down the investigation process completion. These phenomena as a whole impact the quality of human resources (HR) which becomes a key factor in improving investigation performance at Belawan KSOP. Good HR quality includes technical ability, soft skills, and professionalism. However, the disparity in HR quality drives the need for improvement mechanisms through training, coaching, or work system adjustments. This HR quality then becomes the variable suspected to mediate

(intervene) the influence of competence, work culture, and work infrastructure on investigation performance. With the increasing demands for public service, transparency of maritime law enforcement, and digitalization of the port system, the need to improve competence, work culture, and work infrastructure becomes increasingly important to produce investigation quality that is faster, more precise, and accountable.

Problem Identification

1. **Competence** There are differences in technical abilities among investigators in understanding port regulations, conducting case analysis, and compiling investigation dossiers, thus impacting the length of the investigation completion process.
2. **Work Culture** The discipline, compliance with SOPs, professionalism, and integrity of investigators are not yet consistent, thus causing variation in the quality of investigation results.
3. **Work Infrastructure** Investigation facilities, documentation systems, and examination support equipment are not yet adequate, thus hindering the smoothness of administration and case evidence process.
4. **HR Quality** HR quality is not yet uniform, both in terms of technical ability and soft skills, while capacity improvement programs are not yet optimal to meet service demands and digitalization.
5. **Investigation Performance** Case completion still requires more time, investigation results among investigators are not yet uniform, and document administration is not yet optimally organized, so investigation performance is not yet maximal.

Problem Formulation

After the background has been described, the researcher will formulate the problem. The problem formulation in this research is as follows:

1. Does Competence have a positive and significant influence on Investigation Performance at the Belawan Harbormaster and Main Port Authority Office?
2. Does Work Culture have a positive and significant influence on Investigation Performance at the Belawan Harbormaster and Main Port Authority Office?
3. Does Work Infrastructure have a positive and significant influence on Investigation Performance at the Belawan Harbormaster and Main Port Authority Office?
4. Does Competence have a positive and significant influence on the Improvement of HR Quality at the Belawan Harbormaster and Main Port Authority Office?
5. Does Work Culture have a positive and significant influence on the Improvement of HR Quality at the Belawan Harbormaster and Main Port Authority Office?
6. Does Work Infrastructure have a positive and significant influence on the Improvement of HR Quality at the Belawan Harbormaster and Main Port Authority Office?
7. Does Improvement of HR Quality have a positive and significant influence on Investigation Performance at the Belawan Harbormaster and Main Port Authority Office?
8. Does Competence have a positive and significant influence on Investigation Performance through the Improvement of HR Quality at the Belawan Harbormaster and Main Port Authority Office?

9. Does Work Culture have a positive and significant influence on Investigation Performance through the Improvement of HR Quality at the Belawan Harbormaster and Main Port Authority Office?
10. Does Work Infrastructure have a positive and significant influence on Investigation Performance through the Improvement of HR Quality at the Belawan Harbormaster and Main Port Authority Office?

Research Objectives

After obtaining the problem formulation, the researcher forms the research objectives. The objectives of this research are as follows:

1. To test and analyze the influence of Competence on Investigation Performance at the Belawan Harbormaster and Main Port Authority Office.
2. To test and analyze the influence of Work Culture on Investigation Performance at the Belawan Harbormaster and Main Port Authority Office.
3. To test and analyze the influence of Work Infrastructure on Investigation Performance at the Belawan Harbormaster and Main Port Authority Office.
4. To test and analyze the influence of Competence on the Improvement of HR Quality at the Belawan Harbormaster and Main Port Authority Office.
5. To test and analyze the influence of Work Culture on the Improvement of HR Quality at the Belawan Harbormaster and Main Port Authority Office.
6. To test and analyze the influence of Work Infrastructure on the Improvement of HR Quality at the Belawan Harbormaster and Main Port Authority Office.
7. To test and analyze the influence of Improvement of HR Quality on Investigation Performance at the Belawan Harbormaster and Main Port Authority Office.
8. To test and analyze the influence of Competence on Investigation Performance through the Improvement of HR Quality at the Belawan Harbormaster and Main Port Authority Office.
9. To test and analyze the influence of Work Culture on Investigation Performance through the Improvement of HR Quality at the Belawan Harbormaster and Main Port Authority Office.
10. To test and analyze the influence of Work Infrastructure on Investigation Performance through the Improvement of HR Quality at the Belawan Harbormaster and Main Port Authority Office.

Research Benefits

Based on the problem formulation and research objectives, the benefits of this research are as follows:

1. Theoretical Benefits

- a. Provides a contribution to the development of science, specifically in the fields of human resource management, organizational behavior, and performance management in the government and public service sector.
- b. Becomes an academic reference for future researchers who want to study the relationship between HR competence, work culture, work infrastructure, organizational quality, and investigation performance.

2. Practical Benefits

- a. For the Belawan Harbormaster and Main Port Authority Office: As evaluation material and a basis for policy making in improving HR quality, creating a productive work culture, and repairing and completing work infrastructure to support investigation performance.
- b. For Leaders and Management: Provides an overview of the importance of the role of office quality as a link between internal factors and investigation performance, so it can be used as a basis in formulating sustainable performance improvement strategies.
- c. For Employees or Investigators: Provides an understanding of the importance of improving competence, the role of a positive work culture, and the utilization of work infrastructure to support the achievement of optimal work results.
- d. For the Ministry of Transportation or Related Agencies: As input in formulating national policies related to HR development and institutional strengthening in the port and harbormaster environment as a whole.

LITERATURE REVIEW

Investigation Performance

Definition of Investigation Performance

According to Mathis & Jackson (2020), employee performance is the level of contribution given by employees to the achievement of organizational goals. According to Robbins and Judge (2019), performance is "the record of outcomes produced on a specific job function during a specific time period."

Indicators of Investigation Performance

Performance according to Mathis & Jackson (2020) is:

1. Number of cases completed Depicts the quantity of cases successfully completed by investigators in a certain period.
2. Level of investigation success Measured from the percentage of cases successfully transferred to the prosecution stage or declared complete (P21).
3. Average investigation completion time Measures time efficiency in completing a case from the initial stage to completion.
4. Level of compliance with procedures and regulations Shows the extent to which the investigation process is carried out in accordance with standard operating procedures (SOPs), criminal procedure law, and applicable laws and regulations.
5. Number of case files returned by the public prosecutor (P19) Shows the quality of initial investigation results, including formal and material completeness of files.
6. Level of investigator discipline and attendance Measures the personal commitment of investigators to their duties through attendance data and punctuality.
7. Number of public complaints against investigators Reflects aspects of accountability and public satisfaction with the investigation process.
8. Investigator productivity Measured from the number of cases that can be handled by each investigator in a specific unit of time.
9. Efficiency of investigation budget use Assesses the extent to which budget resources are used effectively and efficiently in the investigation process.
10. Frequency of investigator training and competency development Shows efforts to improve the quality of human resources in carrying out investigative duties.

HR Competence

Definition of HR Competence

According to Gibson in Kusuma (2020), competence is a combination of skills, knowledge, and attitudes possessed by a person so that they are able to complete tasks or work effectively in various situations. According to Sedarmayanti (2019), HR competence is a blend of intellectual, technical, and emotional abilities used optimally in work completion to achieve superior work results.

Indicators of HR Competence

Indicators of HR Competence according to Sedarmayanti (2019):

1. Knowledge
The individual's ability to understand and master technical or conceptual information relevant to their work.
2. Skill
The technical and operational ability possessed to complete work tasks efficiently and effectively.
3. Work Attitude
Positive behavioral tendencies towards work, responsibility, and the work environment.
4. Motivation
Internal drive within the individual to achieve work goals and complete tasks as well as possible.
5. Personality
Unique characteristics or traits possessed by individuals in behavior, such as discipline, honesty, and initiative.
6. Work Ethic
Moral values and principles that underlie the way individuals work, including integrity, dedication, and professionalism.

Work Culture

Definition of Work Culture

According to Wibowo (2018), work culture is the values that become habits and driving forces in the work life of an organization that are reflected in attitudes, work habits, and interactions between individuals in the workplace. According to Mangkunegara (2018), work culture is a value system believed in and used as a guide in attitude and behavior by members of the organization in facing organizational problems.

Indicators of Work Culture

According to Wibowo (2018), work culture can be measured through the following indicators:

1. Work Discipline The ability and willingness of employees to comply with rules, schedules, and organizational regulations.
2. Responsibility Employee awareness in completing assigned tasks with full commitment and integrity.
3. Teamwork Ability to collaborate harmoniously and productively with co-workers in achieving common goals.

4. Performance Orientation Work attitude focused on achieving results and continuous productivity improvement.
5. Integrity Honesty and consistency in acting according to moral values and work ethics applicable in the organization.
6. Creativity and Innovation Ability to generate new ideas and effective solutions in facing work challenges.

Work Infrastructure

Definition of Work Infrastructure

According to Moekijat (2018), work infrastructure is everything that is physical and non-physical used as a tool in carrying out tasks and work in the work environment. According to Hasibuan (2020), work infrastructure is physical facilities used by employees in carrying out their daily duties aimed at supporting smoothness, comfort, and work safety.

Indicators of Work Infrastructure

According to Hasibuan (2020), indicators of work infrastructure are as follows:

1. Ability: The individual's ability to do work well and effectively.
2. Self-Development: Individual effort to improve competence and knowledge related to work.
3. Work Spirit: Desire and spirit to work well and productively.
4. Results Achieved: Level of success and achievement reached in work.
5. Quality: Quality of work produced.
6. Efficiency: Ability to do work with minimal time and resources.

Improvement of Human Resource Quality

Definition of HR Quality Improvement

According to Wirawan (2015), HR quality as an integration of physical ability (physical health), and non-physical ability (work professionalism, thinking ability, mental balance, and other skills), with the possessed physical and non-physical abilities, then as individuals will be able to unleash potential, innovate, and work professionally.

Indicators of HR Quality Improvement

According to Wirawan (2015) are as follows:

1. Health
Good HR quality includes good physical health, because good health will support optimal performance at work.
2. Thinking Ability
Critical, analytical, and creative thinking skills are important indicators in improving HR quality.
3. Skills
Adequate technical, interpersonal, and management skills are very important to support HR in carrying out their duties.
4. Knowledge

Broad and relevant knowledge with the field of work will improve HR ability in solving problems and making appropriate decisions.

5. Mental

Good mental health, including emotional balance, motivation, and adaptability to change, is an important indicator in improving HR quality.

6. Performance

HR quality can be measured through individual performance, including work quality, quantity of work results, efficiency, and effectiveness in achieving organizational targets.

7. Motivation

A high level of work motivation will encourage HR to continuously improve performance and achieve optimal results.

8. Involvement

HR involvement in organizational activities, including participation in decision-making processes and organizational development, is an important indicator in improving HR quality.

9. Work Ethics

Good work ethics, such as discipline, responsibility, honesty, and cooperation, will create a positive and productive work environment.

Conceptual Framework

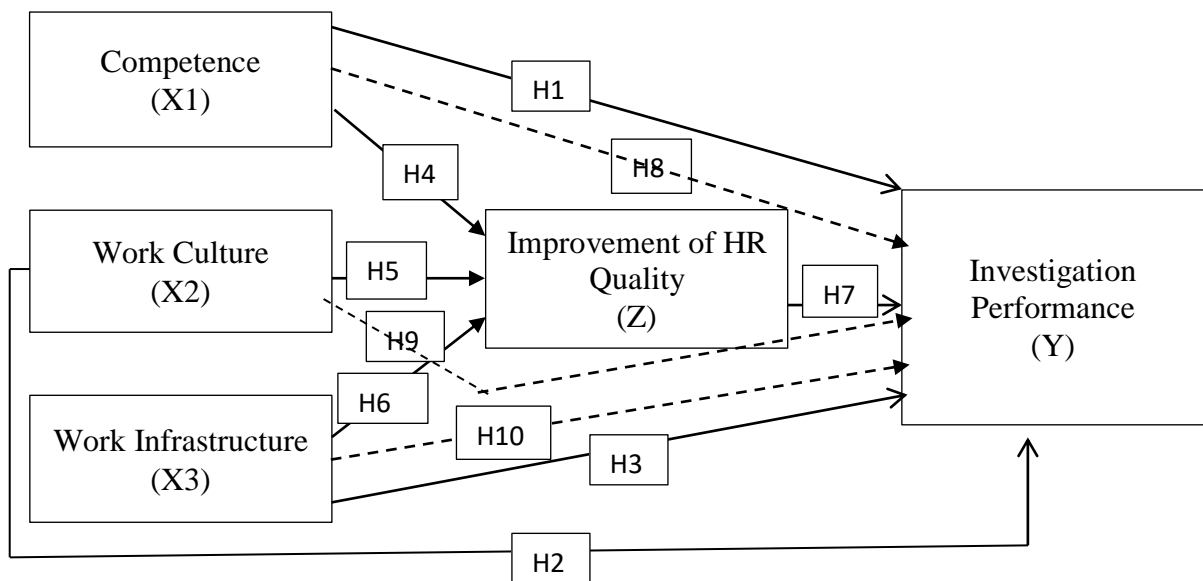


Figure 1. Conceptual Framework

Research Hypotheses

After forming the conceptual framework, the research hypotheses are as follows:

1. Competence has a positive and significant influence on Investigation Performance at the Belawan Harbormaster and Main Port Authority Office.
2. Work Culture has a positive and significant influence on Investigation Performance at the Belawan Harbormaster and Main Port Authority Office.

3. Work Infrastructure has a positive and significant influence on Investigation Performance at the Belawan Harbormaster and Main Port Authority Office.
4. Competence has a positive and significant influence on the Improvement of HR Quality at the Belawan Harbormaster and Main Port Authority Office.
5. Work Culture has a positive and significant influence on the Improvement of HR Quality at the Belawan Harbormaster and Main Port Authority Office.
6. Work Infrastructure has a positive and significant influence on the Improvement of HR Quality at the Belawan Harbormaster and Main Port Authority Office.
7. Improvement of HR Quality has a positive and significant influence on Investigation Performance at the Belawan Harbormaster and Main Port Authority Office.
8. Competence has a positive and significant influence on Investigation Performance through the Improvement of HR Quality at the Belawan Harbormaster and Main Port Authority Office.
9. Work Culture has a positive and significant influence on Investigation Performance through the Improvement of HR Quality at the Belawan Harbormaster and Main Port Authority Office.
10. Work Infrastructure has a positive and significant influence on Investigation Performance through the Improvement of HR Quality at the Belawan Harbormaster and Main Port Authority Office.

Research Methodology

Research Type

The type of research to be used is associative quantitative, which is research aimed at finding out the relationship between two or more variables (Sugiyono, 2018). In this research, the exogenous variables are Competence (X1), Work Culture (X2), and Work Infrastructure (X3). Meanwhile, the endogenous variable is Investigation Performance (Y), and the Intervening Variable is Improvement of HR Quality (Z).

Research Location and Time

Research Location

Belawan Harbormaster and Main Port Authority Office, Jalan Deli, Medan Belawan District, Postal Code 20411

Research Time

This research is conducted from the end of November 2025 to December 2025.

Population and Sample

Population

According to the opinion of several experts, one of them Sugiyono (2018), a population is a generalization area consisting of objects/subjects that have certain qualities and characteristics determined by the researcher to be studied and then conclusions are drawn. The population used is 244 employees.

Sample

According to several experts, one of them Sugiyono (2018), a sample is a part of the number and characteristics possessed by that population. If the population is large, and it is not possible for the researcher to study everything in the population, for example due to limitations of funds, manpower, and time, the researcher can use a sample taken from that population. The sample used is through the Slovin formula. The Slovin formula is as follows:

$$n = 244 / (1 + 244 \times 0,05^2)$$

$$n = 244 / (1 + 244 \times 0,0025)$$

$$n = 244 / (1 + 0,61)$$

$$n = 244 / 1,61$$

$$n = 151,552$$

This means the sample to be used is 152 employees.

Table 1. Number of Samples

Section	Number of Employees	Number of Respondents
1.Tata Usaha	53	$53/244 \times 151 = 33$
2.Pengawasan dan Penindakan	92	$92/244 \times 151 = 57$
3.Lalu Lintas Angkutan Laut	65	$65/244 \times 151 = 40$
4.Perkapalan dan Kepelautan	34	$34/244 \times 151 = 21$
Total	244	151

Source : Data diolah (2025)

Operational Variable Definition

The Operational Variable Definition in this research is as follows:

Table 2. Operational Variable Definition

Variable Type	Definition	Indicators
Investigation Performance (Y)	Performance is the level of contribution given by employees to the achievement of organizational goals. (Mathis & Jackson, 2020)	1. Number of cases completed 2. Level of investigation success 3. Average completion time 4. Compliance with procedures 5. Number of files returned 6. Discipline & attendance of investigators (Mathis & Jackson, 2020)
Competence (X1)	Competence is a blend of intellectual, technical, and emotional abilities used optimally in work completion to achieve superior work results. (Sedarmayanti, 2019)	1. Knowledge 2. Skill 3. Work Attitude 4. Motivation 5. Personality 6. Work Ethic (Sedarmayanti, 2019)
Work Culture (X2)	Work culture is the values that become habits and driving	1. Work Discipline 2. Responsibility

	forces in the work life of an organization reflected in attitudes, work habits, and interactions between individuals. (Wibowo, 2018)	3. Teamwork 4. Performance Orientation 5. Integrity 6. Creativity and Innovation (Wibowo, 2018)
Work Infrastructure (X3)	Work infrastructure is everything that is physical and non-physical used as a tool in carrying out tasks and work in the work environment. (Moekijat, 2018)	1. Completeness of facilities 2. Availability of work tools 3. Physical comfort of work environment 4. Suitability of work facilities with tasks 5. Safety of work environment (Moekijat, 2018)
Improvement of HR Quality (Z)	According to Wirawan (2015), HR quality as an integration of physical ability (physical health), and non-physical ability (work professionalism, thinking ability, mental balance, and other skills), with the possessed physical and non-physical abilities, then as individuals will be able to unleash potential, innovate, and work professionally.	1. Health 2. Thinking Ability 3. Skills 4. Knowledge 5. Mental 6. Performance (Wirawan, 2015)

Data Analysis Technique

The data analysis technique used in this research is quantitative data analysis method. Data analysis in this research uses Structural Equation Modeling (SEM) based on Partial Least Square (PLS) using SmartPLS 3.3.3 software run on a computer.

Measurement Model (Outer Model)

The procedure in testing the measurement model consists of validity test and reliability test.

1. Validity Test

The validity test is used to assess whether a questionnaire is valid or not. A questionnaire is said to be valid if the questionnaire questions are able to reveal something measured by the questionnaire. Validity testing is applied to all question items in each variable.

2. Reliability Test

Generally, reliability is defined as a series of tests to assess the reliability of statement items. The reliability test is used to measure the consistency of a measurement tool in measuring a concept or the consistency of respondents in answering statement items in the questionnaire or research instrument. To measure the reliability level of research variables in PLS, the coefficient alpha or cronbach's alpha value and composite reliability can be used. The cronbach's alpha value is recommended to be greater than 0.7 and composite reliability is also recommended to be greater than 0.7. (Sekaran, 2015)

Structural Model (Inner Model)

This test is conducted to determine the relationship between exogenous and endogenous constructs that have become hypotheses in this research (Hair et al., 2017). To produce inner model test values, the step in SmartPLS is done using the bootstrapping method. The structural model is evaluated using R-square for the dependent variable, Stone-Geisser Q-square test for predictive relevance, and t-test and significance of the structural path coefficient parameters with explanations as follows:

1. Coefficient of Determination / R Square (R²)

In assessing the model with PLS, it starts by looking at R-square for each latent dependent variable. The interpretation is the same as the interpretation in regression. Changes in R-square values can be used to assess the influence of certain independent latent variables on the dependent latent variable whether they have a substantive influence (Ghozali, 2012). R² values generally range from 0 to 1.

2. Predictive Relevance (Q²)

This test is used to measure how well the observed values are generated by the model and also its parameter estimates. If the Q² value is greater than 0, it indicates the model has predictive relevance, meaning it has good observed values, while if the value is less than 0, it indicates the model does not have predictive relevance (Ghozali, 2015).

3. t-Statistic

At this stage, it is used for hypothesis testing, namely to determine the significance of the relationship between variables in the research using the bootstrapping method. In full model Structural Equation Modeling besides confirming theory, it also explains the presence or absence of relationships between latent variables (Ghozali, 2015). A hypothesis is said to be accepted if the t statistic value is greater than the t table. According to (Latan and Ghozali, 2015), the t table value criteria are as follows:

- Value of 1.96 with a significance level of 5%.

4. Path Coefficient

This test is used to determine the direction of the relationship between variables (positive/negative). If the value is from 0 to 1, then the direction of the relationship between variables is stated as positive. Whereas if the value is from 0 to -1, then the direction of the relationship between variables is stated as negative.

5. Model Fit

This test is used to determine the level of fit of the research model with the ideal model for this research, by looking at the NFI value in the program. If the value is closer to 1, the better (good fit).

Results and Discussion

Outer Model Analysis

The purpose of evaluating the outer model is to determine the validity and dependency of the model. This test study will investigate the impact of loading variables, average variance extracted (AVE), discriminant validity, and composite reliability.

Convergent Validity

This test is seen from the loading factor; the boundary value is 0.7, and the boundary value for Average Variance Extracted (AVE) is 0.5; if above these values, it is said to be valid. This means that the value for an indicator is said to be valid if the indicator explains

its variable construct with a value > 0.7. The structural model used in this research is shown in the figure below:

Table 3. Outer Loadings/Cross Loading Stage 1

	Work Culture_(X2)	Investigation Performance_(Y)	Competence_(X1)	Improvement of HR Quality_(Z)	Work Infrastructure_(X3)
X1.1			0,832		
X1.2			0,847		
X1.3			0,745		
X1.4			0,785		
X1.5			0,849		
X1.6			0,845		
X2.1	0,856				
X2.2	0,844				
X2.3	0,820				
X2.4	0,817				
X2.5	0,893				
X2.6	0,827				
X3.1					0,868
X3.2					0,867
X3.3					0,895
X3.4					0,824
X3.5					0,837
Y.1		0,869			
Y.2		0,898			
Y.3		0,818			
Y.4		0,370			
Y.5		-0,143			
Y.6		-0,099			
Z.1				0,788	
Z.2				0,847	
Z.3				0,844	
Z.4				0,872	
Z.5				0,877	
Z.6				0,856	

Source : Smart PLS 3.3.3

The Outer Loadings measurement results show that each indicator dominantly loads on its respective variable construct. For the Competence variable (X1), loading values range from 0.745 to 0.849, which shows consistency of indicators in explaining the competence construct. The Work Culture variable (X2) also has high loading values, between 0.817 and 0.893, thus reflecting a strong contribution of indicators to the work

culture construct. For the Work Infrastructure variable (X3), loading values are in the range of 0.824 to 0.895, indicating that all indicators can represent the variable well. The Improvement of HR Quality variable (Z) shows loading values between 0.788 and 0.877, so it can be said to be reliable in explaining the intended variable. Meanwhile, for the Investigation Performance variable (Y), there are three indicators that show strong loading, namely Y1 to Y3 with values of 0.818 to 0.898. However, indicators Y4, Y5, and Y6 have much lower or even negative loading values, so at this stage these indicators are not yet able to explain the construct optimally and have the potential to be eliminated in the next stage. Overall, the first-stage results show that most indicators have met the initial convergent validity criteria.

Table 4. Outer Loadings/Cross Loading Stage 2

	Work Culture_(X2)	Investigation Performance_(Y)	Competence_(X1)	Improvement of HR Quality_(Z)	Work Infrastructure_(X3)
X1.1			0,832		
X1.2			0,848		
X1.3			0,745		
X1.4			0,786		
X1.5			0,849		
X1.6			0,845		
X2.1	0,855				
X2.2	0,845				
X2.3	0,820				
X2.4	0,818				
X2.5	0,893				
X2.6	0,827				
X3.1					0,868
X3.2					0,867
X3.3					0,895
X3.4					0,824
X3.5					0,836
Y.1		0,888			
Y.2		0,902			
Y.3		0,814			
Z.1				0,788	
Z.2				0,847	
Z.3				0,844	

Z.4				0,872	
Z.5				0,877	
Z.6				0,856	

Source : Smart PLS 3.3.3

In the second stage, the Outer Loadings results show an improvement in the quality of the measurement model after the removal of indicators that did not meet the requirements in the previous stage. All indicators in the Competence variable (X1) are consistently in the range of 0.745 to 0.849, showing stable contributions in explaining the competence construct. The Work Culture variable (X2) also continues to show high loading values in the range of 0.818 to 0.893, so it can be stated as strong and valid in measuring that construct. The Work Infrastructure variable (X3) again shows strong loading values, namely between 0.824 and 0.895, so the work infrastructure indicators are considered reliable in explaining the variable. For the Improvement of HR Quality variable (Z), loading values range from 0.788 to 0.877, and all indicators have met the convergent validity criteria. The most significant change is seen in the Investigation Performance variable (Y), where the remaining indicators (Y1, Y2, and Y3) show high loading values, namely 0.814 to 0.902. The elimination of previously invalid indicators has made the construct better and meets reliability requirements. Overall, in the second stage, all indicators have shown strong convergent validity and are able to optimally represent their respective constructs.

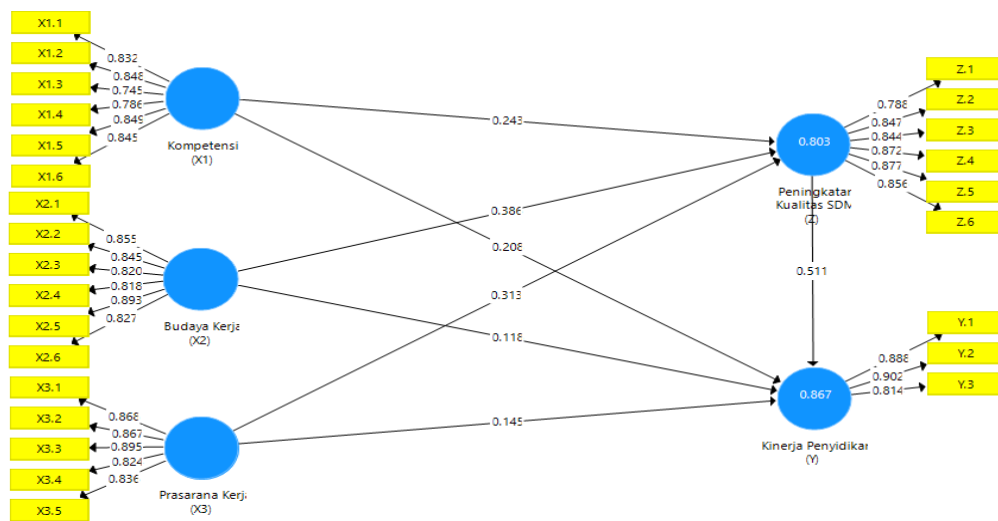


Figure 2. Outer Model

Source : Smart PLS 3.3.3

Smart PLS output for loading factor provides results in the following table: Outer Loadings. In this research, there are equations and those equations consist of two substructures. For substructure 1:

$$Z = b_1X_1 + b_2X_2 + b_3X_3 + e_1$$

$$Z = 0,243 + 0,386 + 0,313 e_1$$

For substructure 2

$$Y = b_2X_1 + b_3X_2 + b_4X_3 + b_5Z + e_2$$

$$Y = 0,208 + 0,118 + 0,145 + 0,511 e_2$$

Discriminat Validity

The next step is to understand data that is valid in terms of its discriminant validity, with the aim of finding out whether the amount of cross loading is greater compared to other variables, to determine which indicator has a higher correlation with the variable construction. The cross loading results of the validity test are as follows:

Table 5. Discriminant Validity

	Work Culture_(X2)	Investigation Performance_(Y)	Competence_(X1)	Improvement of HR Quality_(Z)	Work Infrastructure_(X3)
X1.1	0,652	0,688	0,832	0,649	0,658
X1.2	0,664	0,735	0,848	0,703	0,719
X1.3	0,620	0,657	0,745	0,627	0,607
X1.4	0,734	0,706	0,786	0,683	0,688
X1.5	0,772	0,687	0,849	0,676	0,677
X1.6	0,720	0,694	0,845	0,720	0,681
X2.1	0,855	0,785	0,759	0,790	0,818
X2.2	0,845	0,714	0,685	0,724	0,709
X2.3	0,820	0,657	0,669	0,643	0,653
X2.4	0,818	0,720	0,722	0,756	0,673
X2.5	0,893	0,806	0,768	0,782	0,818
X2.6	0,827	0,680	0,678	0,679	0,776
X3.1	0,764	0,784	0,726	0,744	0,868
X3.2	0,762	0,792	0,735	0,753	0,867
X3.3	0,881	0,794	0,792	0,785	0,895
X3.4	0,667	0,640	0,605	0,684	0,824
X3.5	0,692	0,640	0,655	0,685	0,836
Y.1	0,805	0,888	0,729	0,852	0,784
Y.2	0,799	0,902	0,743	0,831	0,801
Y.3	0,640	0,814	0,750	0,674	0,634
Z.1	0,686	0,702	0,706	0,788	0,698
Z.2	0,710	0,769	0,731	0,847	0,740
Z.3	0,710	0,697	0,659	0,844	0,693
Z.4	0,816	0,871	0,748	0,872	0,794
Z.5	0,738	0,816	0,721	0,877	0,727
Z.6	0,745	0,751	0,638	0,856	0,677

Source : Smart PLS 3.3.3

The discriminant validity table shows that each indicator has a higher loading value on its own variable construct compared to other variables. This is seen from the dominance of loading values of the Competence (X1), Work Culture (X2), Work Infrastructure (X3), Investigation Performance (Y), and Improvement of HR Quality (Z) indicators that are consistently larger in their respective construct columns. These results indicate that the indicators are able to differentiate well between constructs, so there is no overlapping measurement. Thus, the model has met the discriminant validity criteria, and the research variables are considered to have the ability to clearly distinguish concepts from one another.

Composite reliability

In composite reliability research, each variable is compared for its reliability level, and if the reliability level is greater than 0.60, the research is considered reliable; if the reliability level is between 0.60 and 0.7, the research is considered unreliable. There are several blocks to determine whether the research is reliable or not, valid or not.

Table 6. Construct Reliability and Validity

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Work Culture_(X2)	0,919	0,937	0,711
Investigation Performance_(Y)	0,838	0,902	0,755
Competence_(X1)	0,901	0,924	0,670
Improvement of HR Quality_(Z)	0,922	0,939	0,719
Work Infrastructure_(X3)	0,911	0,933	0,737

Source : Smart PLS 3.3.3

The results of construct reliability and validity testing show that all variables have Cronbach's Alpha and Composite Reliability values above the minimum limit of 0.70, so it can be concluded that the instrument used is reliable and consistent in measuring the construct. In addition, the Average Variance Extracted (AVE) value for each variable is above 0.50, which means the variable has good convergent validity and is able to adequately explain the variance of its indicators. Thus, all variables in the research model are declared to meet the construct reliability and validity criteria.

Inner Model Analysis

Evaluation of the structural model (inner model) is carried out to ensure that the basic model created is robust and appropriate. The inspection stages carried out in the assessment of the primary model are seen from several markers, namely:

Coefficient of Determination (R2)

Based on data analysis conducted using the SmartPLS 3.0 program, the following R Square values were obtained:

Table.7. R Square Results

	R Square	Adjusted R Square
Investigation Performance (Y)	0,867	0,863
Improvement of HR Quality (Z)	0,803	0,798

Source : Smart PLS 3.3.3

The R Square value shows that the independent variables have a strong contribution in explaining the dependent variable. The Investigation Performance (Y) variable has an R Square value of 0.867, which means 86.7% of the variation in investigation performance can be explained by the variables influencing it in the model, while the rest is explained by other factors outside the model. Meanwhile, the Improvement of HR Quality (Z) variable has an R Square value of 0.803, showing that 80.3% of its variation can be explained by the constructs influencing it. The Adjusted R Square value, which is not much different from R Square, indicates a good and stable model. Overall, these results indicate the very strong predictive ability of the model.

Hypothesis Testing

After determining the inner model, the next step is to determine the relationship between variables and hypotheses in this case. Speculation in this review is done by looking at T-Statistics and P-Values. This testing determines whether T-Insights > 1.96 and P-Values < 0.05. The following are the results of the Direct Impact Path Coefficients.

Table 8. Path Coefficients (Direct Effects)

	Original Sample (O)	T Statistics (O/STDEV I)	P Values	Results
Work Culture (X2) -> Investigation Performance (Y)	0,118	1,388	0,083	Rejected
Work Culture (X2) -> Improvement of HR Quality (Z)	0,386	4,065	0,000	Accepted
Competence (X1) -> Investigation Performance (Y)	0,208	3,242	0,001	Accepted
Competence (X1) -> Improvement of HR Quality (Z)	0,243	3,591	0,000	Accepted
Improvement of HR Quality (Z) -> Investigation Performance (Y)	0,511	6,463	0,000	Accepted
Work Infrastructure (X3) -> Investigation Performance (Y)	0,145	2,157	0,016	Accepted
Work Infrastructure (X3) -> Improvement of HR Quality (Z)	0,313	3,699	0,000	Accepted

Source : Smart PLS 3.3.3

1. Hypothesis of Work Culture on Investigation Performance Work culture has a positive but not significant influence on investigation performance with a coefficient value of 0.118, T-statistic 1.388 and p-value 0.083 so the hypothesis is stated as rejected.
2. Hypothesis of Work Culture on Improvement of HR Quality Work culture has a positive and significant influence on the improvement of HR quality with a coefficient of 0.386, T-statistic 4.065 and p-value 0.000 so the hypothesis is accepted.

3. Hypothesis of Competence on Investigation Performance Competence is proven to have a positive and significant influence on investigation performance with a coefficient of 0.208, T-statistic 3.242 and p-value 0.001 so the hypothesis is accepted.
4. Hypothesis of Competence on Improvement of HR Quality Competence has a positive and significant influence on the improvement of HR quality with a coefficient of 0.243, T-statistic 3.591 and p-value 0.000 so the hypothesis is accepted.
5. Hypothesis of Improvement of HR Quality on Investigation Performance Improvement of HR quality provides the most dominant positive influence on investigation performance with a coefficient of 0.511, T-statistic 6.463 and p-value 0.000 so the hypothesis is accepted.
6. Hypothesis of Work Infrastructure on Investigation Performance Work infrastructure has a positive and significant influence on investigation performance with a coefficient of 0.145, T-statistic 2.157 and p-value 0.016 so the hypothesis is accepted.
7. Hypothesis of Work Infrastructure on Improvement of HR Quality Work infrastructure has a positive and significant influence on the improvement of HR quality with a coefficient of 0.313, T-statistic 3.699 and p-value 0.000 so the hypothesis is accepted.

Table 9. Path Coefficients (Indirect Effects)

	Original Sample (O)	T Statistics (O/STDEV)	P Values	Results
Work Culture_(X2) -> Improvement of HR Quality_(Z) -> Investigation Performance_(Y)	0,197	3,304	0,001	Accepted
Competence_(X1) -> Improvement of HR Quality_(Z) -> Investigation Performance_(Y)	0,124	3,293	0,001	Accepted
Work Infrastructure_(X3) -> Improvement of HR Quality_(Z) -> Investigation Performance_(Y)	0,160	3,068	0,001	Accepted

Source : Smart PLS 3.3.3

8. Hypothesis of Work Culture through Improvement of HR Quality on Investigation Performance: Work culture is proven to have a positive and significant influence on investigation performance through improvement of HR quality as an intervening variable, with a coefficient of 0.197, T-statistic 3.304 and p-value 0.001, so the hypothesis is accepted.
9. Hypothesis of Competence through Improvement of HR Quality on Investigation Performance: Competence also has a positive and significant influence on investigation performance through improvement of HR quality, indicated by a coefficient of 0.124, T-statistic 3.293 and p-value 0.001, so the hypothesis is accepted.
10. Hypothesis of Work Infrastructure through Improvement of HR Quality on Investigation Performance: Work infrastructure has a positive and significant influence on investigation performance through improvement of HR quality, with a coefficient of 0.160, T-statistic 3.068 and p-value 0.001, so the hypothesis is accepted.

Conclusion

After obtaining the hypothesis results, the conclusions of this research are as follows:

1. Work culture does not have a significant direct influence on improving investigation performance, so the hypothesis is rejected.
2. Work culture has a significant influence on improving HR quality, so the hypothesis is accepted.
3. Competence has a significant influence on improving investigation performance, so the hypothesis is accepted.
4. Competence is proven to be able to significantly improve HR quality, so the hypothesis is accepted.
5. Improvement of HR quality has the strongest and most significant influence on investigation performance, so the hypothesis is accepted.
6. Work infrastructure has a positive and significant influence on investigation performance, so the hypothesis is accepted.
7. Work infrastructure has a significant contribution in improving HR quality, so the hypothesis is accepted.
8. Work culture is proven to be able to improve investigation performance if mediated by improvement of HR quality, so the hypothesis is accepted.
9. Competence has a significant influence on investigation performance through improvement of HR quality, so the hypothesis is accepted.
10. Work infrastructure is also proven to be able to improve investigation performance through improvement of HR quality, so the hypothesis is accepted.

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