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OPTIMISATION OF AVIATION HUMAN RESOURCES: THE ROLE OF TRAINING, DISCIPLINE AND JOB SATISFACTION IN ENSURING FLIGHT SAFETY

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ABSTRACT
Commercial aviation has experienced significant growth in recent years; in 2024, passenger growth reached 54.76 million. This is inseparable from supporting factors such as aviation security, where Aviation Security personnel serve as a strategic element responsible for flight safety. However, the performance of Aviation Security personnel at Terminal 3 still faces obstacles. Field phenomena indicate low work discipline with an average lateness rate of 35.83% and a competency urgency where 96% of personnel require additional training. Additionally, a pre- research survey revealed a job satisfaction level of 76% and performance realization of 68%, both still below the management standard of 90%. The objective of this study is to analyze the factors influencing the performance of these Avsec personnel, specifically at Terminal 3 of Soekarno-Hatta Airport. The sample consists of 200 respondents determined using a saturated sampling technique, focusing on Aviation Security personnel assigned to Security Check Point 2. Data collection utilized an online questionnaire instrument. Data analysis was undertaken employing SEM-PLS 4. On the basis of the analytical outcomes, it may be adduced that, with respect to direct effects, training exerts a positive and statistically significant influence on performance, whereas work discipline does not manifest a positive effect on performance. Nonetheless, in regard to indirect effects, both training and work discipline evince a positive and significant influence on the performance of Aviation Security personnel when their effects are channelled through the mediating construct of job satisfaction. The research implications suggest that increased training activities, work discipline behavior, and job satisfaction impact performance, thereby enhancing the performance of Aviation Security personnel as the front line of aviation security operations.

INTRODUCTIONS

The aviation industry in Indonesia, particularly commercial aviation, has experienced significant growth in recent years. One example is Soekarno-Hatta Airport. Based on data from the Central Statistics Agency (BPS),

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Soekarno-Hatta Airport had a total of 54.76 million passengers in 2024, including domestic and international departures, arrivals and transit passengers. This figure represents a 7% increase from 2023, which was 51.07 million passengers.

This growth in passenger numbers is inseparable from supporting factors such as airport facilities and infrastructure, airport service levels and guaranteed flight safety at airports (Misbah & Pamuraharjo, 2024). In addition to the factors mentioned above, competition between airlines is also one of the factors driving service improvements and operational efficiency, which ultimately attracts more passengers to use air transportation.

PT Angkasa Pura Indonesia, as the airport operator in Indonesia, manages several airports that are among the busiest in the Asia-Pacific region. as evidenced by the awarding of one of PT Angkasa Pura Indonesia's airports, Soekarno-Hatta Airport, as the 'Best Airport over 40 million Passengers in Asia-Pacific 2024' at the 2024 ASQ Awards organised by the Airport Council International (ACI).

In terms of passenger services, Soekarno-Hatta Airport has three terminals, namely Terminal 1, Terminal 2 and Terminal 3, each of which has its own functions and services. Terminal 1 only serves domestic flights in the Low Cost Carrier (LCC) category, Terminal 2 handles domestic and international flights in a mixed category between full service and low-cost carriers, and Terminal 3 handles domestic and international flights in the full service and premium business class categories.

Terminal 3 of Soekarno-Hatta International Airport has the highest passenger volume compared to Terminal 1 and Terminal 2. This is in line with its role as the main hub for international and domestic flights for major airlines such as Garuda Indonesia and a number of foreign airlines. Modern facilities and greater capacity make Terminal 3 the main hub for passenger activity at this airport. Research by Intan et al. (2022) shows that the facilities and service quality at Terminal 3 have a positive and significant influence on passenger satisfaction, reflecting the high volume of passenger activity at this terminal. In addition, a study by Yuliyanto et al. (2023) emphasises the importance of the performance of customer service officers, check-in counters, boarding gates, and flight security in improving passenger satisfaction, which also indicates the high level of passenger activity at Terminal 3.

The high number of passengers at Terminal 3 of Soekarno-Hatta Airport requires more efficient operational management and excellent service to airport users to ensure the smooth running of flight activities. One factor supporting operational activities at Terminal 3 of the airport that should not be underestimated is flight safety (Yuliyanto et al., 2023), where Aviation Security (Avsec) personnel are a strategic element because they are responsible for conducting security checks on passengers and their luggage before they enter the departure area. This is congruent with Minister of Transportation Regulation No. PM 80 of 2017, which delineates the National Aviation Security Programme. In addition, the treatise by Dwi (2023) intimates that the successful operationalisation of the security architecture is, to a considerable extent, predicated upon the adeptness of Avsec personnel in discharging their mandates in scrupulous adherence to the extant security canons and procedural stipulations. This is consistent with the findings of Sinaga and Sembiring (2025), which reveal that competence and health have a positive and significant effect on flight safety.

The effectiveness of Avsec personnel greatly affects the overall smooth operation of the airport. Avsec personnel must work professionally and in accordance with procedures to ensure passenger safety and comfort. Another study by Ali and Sari (2024). confirms that Avsec performance has a significant influence on aviation security and safety at airports. while research by Herlinawati and Puspitasari (2024) highlights the importance of optimising Avsec personnel performance through senior supervision, individual competence, skills development, and routine evaluations of work discipline to improve the quality of security services and ensure flight safety.

Most follow-up actions on important incidents at Soekarno-Hatta Airport involve internal aviation security investigations, which are submitted to management and forwarded to the police and airport authorities for resolution. The occurrence of important incidents such as the escape of Prohibited Items and Dangerous Goods as listed in the

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table is an indication of errors made by Aviation Security personnel while performing inspections. The author believes that this can be minimised and even avoided if personnel have individual competencies that meet the standards.

The singular prowess of personnel may be cultivated through training, which constitutes a pivotal determinant shaping the performance of Aviation Security officers at airports. By means of substantive and well-orchestrated training, Aviation Security personnel are able to augment their technical acumen, interpersonal adeptness, and preparedness to contend with a spectrum of prospective security contingencies in operational environments. Research conducted by Erchan et al. (2024) and Sidarta and Kusuma (2023) in the airport environment shows that continuous training can improve the accuracy and precision of personnel in making decisions in critical situations. In addition, structured and routine training also plays a role in strengthening personnel's understanding of standard operating procedures, the use of the latest security technology, and the development of a professional attitude in carrying out their duties. Thus, investment in comprehensive training programmes not only improves the performance of individual Aviation Security personnel, but also contributes significantly to improving overall aviation safety and security. This perspective is in line with the findings of Sembiring & Sembiring (2024), which indicate that human resource development involves continuous efforts to improve knowledge, skills, and capacity, while also providing personnel with opportunities to continuously learn and adapt to developments in their respective fields of duty.

Moreover, Aviation Security personnel who exhibit stringent discipline and are capable of discharging their functions in unwavering conformity with standard operating procedures (SOPs) can effectively safeguard passenger security and comfort. The inquiry conducted by Eka et al. (2023) scrutinised the repercussions of occupational discipline and the corporeal work milieu on work ethic and its ramifications for employee performance. The findings indicated that work discipline exerts a positive and statistically significant influence on work ethic, which, in turn, culminates in enhanced employee performance (Rahmadani & Alam, 2024).

This confirms that good work discipline can increase the effectiveness of task implementation in the public service sector, including in the field of airport security. Thus, high work discipline among Aviation Security personnel not only ensures that tasks are carried out according to procedure, but also increases public confidence in airport security standards. The consistent application of work discipline and effective supervision by Aviation Security coordinators will help maintain and improve the quality of personnel performance, which ultimately contributes to the smooth operation of the airport as a whole.

Aviation Security personnel still have a level of discipline that does not comply with the rules applicable in the Terminal 3 Screening Protection unit. From the author's interviews with the management of the Terminal 3 Screening Protection unit, it was stated that the tolerance limit for tardiness is set at below 5% and no-shows or absences without explanation are 0%. This tolerance limit is very strict considering that airport security personnel require a high level of discipline, so the level of discipline of Aviation Security personnel is still above the applicable tolerance limit.

Then, job satisfaction likewise constitutes an essential component that operates as a mediating linkage in the association between training and work discipline and employee performance. Personnel who experience satisfaction with their work tend to be more impelled, deeply committed, and exhibit pronounced fidelity to the organization. Drawing on the findings of Sumardianti (2021), there exists a significant association between self-efficacy and job satisfaction and employees' occupational loyalty. This corroborates that the higher the degree of employees' job satisfaction, the greater their work loyalty, which consequently influences their performance.

Research conducted by Wicaksono et al. (2023) examined the effects of training, the work milieu, and discipline on member performance, with job satisfaction positioned as an intervening variable. The results demonstrated that training exerts a positive influence on job satisfaction, which subsequently elevates employee performance. Work discipline was likewise found to have a favourable effect on both job satisfaction and employee performance. This illustrates that the combination of effective training and strong work discipline elevates job satisfaction, which then positively affects employee performance. These findings are similar with the results reported

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by Sembiring and Sembiring (2024), which reveal that competence and human resource development have a positive and simultaneous effect on employee performance.

To ascertain that there are several factors affecting the performance of Aviation Security personnel, the author conducted a preliminary survey of 25 respondents, namely Aviation Security personnel, regarding training, work discipline, performance and job satisfaction, with the hope of obtaining an overview of the situation of Aviation Security personnel on duty at Security Check Point 2 Terminal 3.

Several issues concerning Aviation Security personnel working at Security Checkpoint 2 in Terminal 3 that the author believes are relevant to this study are as follows:

First, 96% of personnel stated that they needed training to improve their competencies, which indicates that most personnel still need training activities to improve their individual competencies in order to meet the competencies that are not yet satisfactory for them.

Second, 40% of personnel stated that they did not complete their work on time, which is related to personnel discipline. Of course, attendance data is also an indicator of personnel discipline levels, which are still below the stipulated level of 5%.

Third, 76% of personnel expressed satisfaction with their work results, whereas the standard considered satisfactory by management is above 90%.

Fourth, 68% of personnel stated that they successfully achieved the work results expected by their superiors, which is still below the standard considered satisfactory by management, which is above 90%.

Based on the above phenomena and descriptions, the author is interested in conducting research entitled 'The Effect of Training and Work Discipline on Performance Mediated by Job Satisfaction among Aviation Security Personnel at PT IAS Support Indonesia in Terminal 3 of Soekarno-Hatta Airport'. This research is expected to contribute to the development of human resources in the aviation security sector and serve as evaluation material for improving service quality in the airport environment.

LITERATURE REVIEW

Organisational Behaviour

Robbins and Judge (2009) describe organisational behaviour as a branch of science that examines how individuals, groups, and organisational structures influence each other to form patterns of behaviour within an organisation. The main objective is to use this understanding to improve the overall performance and effectiveness of the organisation.

Kalwani and Mahesh (2020) contend that organisational behaviour constitutes the systematic examination of human conduct within organisational settings. It represents a multidisciplinary field that seeks to comprehend individual and group behaviour, interpersonal interactions, and organisational dynamics. This area of study synthesises insights from psychology, sociology, political science, and economics. As an academic discipline, organisational behaviour may be delineated into three succinct tiers: micro (individual), meso (group), and macro (organisational).

Human Resources Management

Human resource management is the process through which an organisation stimulates and mobilises all its employees to attain organisational objectives effectively and efficiently (Atikbay & Öner, 2020). Furthermore, human resource management encompasses the processes of recruiting, training, appraising, and remunerating employees, as well as handling matters related to labour relations, occupational health and safety, and equity (Dessler, 2015). Hence, the primary aim of HRM is to realise maximum efficiency by positioning the appropriate individuals in the appropriate roles at the appropriate time and achieving organisational objectives within the desired timeframe time (Atikbay & Öner, 2020).

Training

In his book, Ajabar (2020) states that training is a process designed to improve technical knowledge and skills or enhance an employee's performance. Training is a systematic process of changing employee behaviour in a certain

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direction to improve the knowledge and expertise of an employee or workforce in performing certain tasks or jobs. Furthermore, according to Dessler (2013), 'Training is a process of pursuing the skills needed by employees to carry out their work, whereby employee training provides practical knowledge and its application in the corporate world to increase work productivity in achieving the desired goals of the company organisation.'

Work Discipline

Work discipline is part of human resource management in terms of obedience, order, regularity, and compliance with the rules of an organisation related to the tasks or work of that organisation. Various activities within an organisation are carried out by members or personnel who have a certain portion of work that has been arranged with their respective workloads and responsibilities. Each job or field of work has specific targets, both in terms of quantity, such as production volume, working hours, and optimal manpower, as well as quality, such as work quality or compliance with the work methods established by the organisation (Ajabar, 2020).

Job Satisfaction

An important suggestion in measuring the success of human resource management in an organisation is to look at the job satisfaction of its members. In some research cases, job satisfaction is closely related to organisational performance, as increased performance is often indicated by high job satisfaction. Conversely, poor performance will be reflected in the dissatisfaction of workers in carrying out their work activities (Ajabar, 2020). On a personal level, workers who are satisfied with their jobs will perform their duties at a higher level than those who are less satisfied. This can be seen from the level of work productivity, absenteeism and employee turnover rates.

Performance

Performance appraisal entails observing and assessing employee performance, documenting the evaluations, and delivering feedback to employees. Throughout the appraisal process, competent managers offer feedback and commendation on satisfactory aspects of employee performance while also clarifying performance areas requiring improvement (Nankervis et al., 2019). Employee performance is an essential determinant of organisational success due to its strong linkage with employee productivity, both in role execution and overall organisational outcomes. Consequently, this factor receives considerable attention from both scholars and organisations To explore the factors that influence employee performance, many studies have been conducted using various variables that are considered to be drivers of employee performance (Al-kharabsheh et al., 2022).

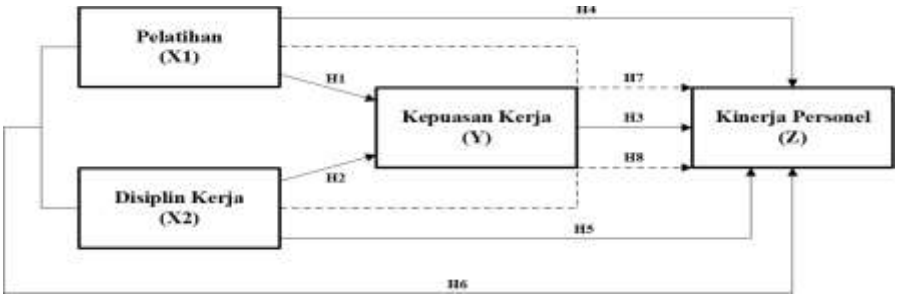

Figure 1. Research Paradigm

Based on the above research paradigm, the author formulates the following hypotheses for this study:

H1: Training has a positive effect on the job satisfaction of Aviation Security personnel.

H2: Work discipline has a positive effect on the job satisfaction of Aviation Security personnel.

H3: Job satisfaction has a positive effect on the performance of Aviation Security personnel.

H4: Training has a positive effect on the performance of Aviation Security personnel.

H5: Work discipline has a positive effect on the performance of Aviation Security personnel.

Ha6: Training and work discipline simultaneously affect the performance of Aviation Security personnel

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Ha7: Job satisfaction mediates the positive effect of training on the performance of Aviation Security personnel
Ha8: Job satisfaction mediates the positive effect of work discipline on the performance of Aviation Security personnel

RESEARCH METHODOLOGY

In this study, the method used is descriptive verification with a quantitative approach. Wakarmamu and Si (2021) state that the descriptive method aims to describe and explain the phenomenon or object of research by collecting relevant data so that it can provide an accurate picture of the characteristics, functions, or relationships between the variables observed.

Variable Operationalisation

In this research, several categories of variables were employed. The definitions and types of variables used were cited from Bougie and Sekaran (2016), who state that research variables are anything that differentiates or alters values, where these values may vary at different times for the same object or at the same time for different objects. Variables are anything capable of assuming different or fluctuating values. These values may change at different times for the same object or individual, or at the same time for different objects or individuals (Bougie & Sekaran, 2019).

Accordingly, the variables employed in this research comprise independent variables, namely variables that exert influence within a causal relationship involving two or more variables (Sekaran & Bougie, 2016). In this study, the independent variables are designated as X (training/X1, work discipline/X2). The dependent variable is the principal outcome variable that constitutes the main focus of the researcher's attention. In this study, the dependent variable is denoted by Y (aviation security personnel performance), while the intervening variable is indicated by Z (job satisfaction).

Data Collection Techniques and Data Sources

This study uses primary data. Bougie and Sekaran (2019) define primary data as a method of collecting data from original sources for specific research purposes. Primary data are gathered directly by researchers to address the research questions. In this study, primary data were obtained through observation and the administration of questionnaires.

The subsequent key stage in the data collection procedure is testing the research instruments, which encompasses two components: validity and reliability testing using a one-tailed approach. The following section outlines the validity and reliability testing procedures to be employed in this study through the use of Partial Least Squares Structural Equation Modelling software, commonly referred to as SmartPLS version 4.

Population

The population in this study is the Aviation Security Personnel of PT IAS Support at Terminal 3 of Soekarno Hatta Airport at Security Check Point 2, which is the border between the public area and the restricted area, numbering 200 people.

Sampling Technique and Sample Determination

The sampling technique used in this study is saturated sampling. The population in this study consists of all Aviation Security personnel working at Terminal 3 of Soekarno-Hatta Airport, which is divided into two work areas, namely the domestic and international areas. Each area consists of four groups, with each group consisting of one squad commander and 24 Aviation Security members. The following is a list of Aviation Security personnel from PT IAS Support Indonesia who are assigned to Terminal 3 of Soekarno-Hatta Airport at Security Check Point 2, who were the respondents in this study.

Data Processing Techniques

In line with the verificative approach employed to address the stated research questions, the analysis was carried out using the SEM-PLS technique to ascertain the magnitude of the effect of training and work discipline on the performance of Aviation Security personnel, with job satisfaction acting as a mediating variable, which is expressed in the following equation:

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$$Y = a + b1X1 + b2X2 + e$$

Explanation:
$X1$ = Training
$X2$ = Work Discipline
Z = Personnel Performance
a = Z increase coefficient if there is a one-unit increase in X
b = Regression coefficient
e = Error in research

RESEARCH RESULTS

Respondent Characteristics

The respondents successfully collected consisted of Aviation Security personnel working in two areas, namely the Domestic and International areas, each area having a percentage of 50%. This shows that the distribution of respondents in this study was very balanced between the two work areas. With the same number of respondents from each area, the results of the study are expected to represent the conditions in both work environments fairly and equally. In addition, this balanced number also avoids any tendencies or biases that might arise if one area had more respondents. Therefore, this balanced number of respondents can be used as good data and can describe the conditions of all Aviation Security personnel in both the Domestic and International areas.

The majority of respondents working at Security Check Point 2 held the position of member, with a very dominant percentage of 96% of the total respondents. Meanwhile, personnel with the position of squad commander only accounted for 4%, indicating a significant imbalance between the two job levels. This finding has important implications in the context of planning and decision-making, particularly in relation to the development and implementation of training programmes. This data can be used as a solid basis for designing more targeted training, focusing on the needs and competencies of personnel with member positions. Thus, the training programme is expected to have a maximum impact on performance improvement, as it is directed at the largest group carrying out operational tasks in the field. Adjusting the training material and methods to the characteristics of the majority of these positions will also strengthen the effectiveness and efficiency of the training implementation as a whole.

The majority of Aviation Security personnel at Security Check Point 2 are male, with a percentage of 83%. Therefore, training programmes and policies designed for development need to take this demographic into account. Management can focus on creating training that is relevant and appealing to this majority, while ensuring that all development programmes remain inclusive and accessible to all personnel. This will ensure that all personnel will benefit maximally from these initiatives, which will ultimately improve the overall performance of the organisation.

The majority of Aviation Security personnel at Security Check Point 2 are aged 26 to 30, with a percentage of 53%. Thus, Aviation Security personnel in this age range are likely to have excellent physical, cognitive and emotional abilities. These excellent conditions contribute positively to their performance, because airport security tasks require personnel who are alert, quick to respond to their duties and responsibilities, such as in emergencies, and have good emotional management to deal with the dynamics of passengers on a daily basis. In addition, continuous training and development will further strengthen their competencies, helping them to stay up-to-date with technological changes and new methods relevant to their work.

The majority of Aviation Security personnel at Security Check Point 2 have a high school education, with a percentage of 85%. Thus, there is a significant need to improve the education level of Aviation Security personnel through further education programmes.

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through further education programmes or specialised training. Improving this education level can help Aviation Security personnel acquire more in-depth knowledge, more complex skills, and better analytical abilities. Investing in higher education programmes, such as diplomas or bachelor's degrees in management, can improve the overall performance of Aviation Security personnel and contribute to the efficiency and effectiveness of the organisation.

The majority of Aviation Security personnel at Security Check Point 2 have been working for 8–10 years, accounting for 31% of the total. Aviation Security personnel in this range of service usually have considerable and in-depth work experience in their field. This experience can contribute positively to their performance because they have a good understanding of their duties and responsibilities and are well adapted to the dynamics of the job. In addition, if Aviation Security personnel have good experience, it is certain that their work will be more efficient and effective because they already have a thorough understanding of what they are doing and what they will be doing, as well as how to anticipate problems that may arise.

Measurement Model Test Results (Outer Model)

Testing of the measurement model, or outer model, is a procedure that examines indicators in relation to latent variables, or, in other words, assesses the degree to which the indicators are able to account for their latent constructs. The indicators employed in measurement model testing include convergent validity, discriminant validity, and reliability.

According to Hair et al. (2021), an additional criterion for convergent validity is that the Average Variance Extracted (AVE) must be ≥ 0.50, signifying that the construct is capable of explaining more than half of the variance of its indicators. Subsequently, the Average Variance Extracted in this study will be described in order to assess the next criterion, namely that the AVE value must be ≥ 0.50, which will be displayed in the table below.

Table 1. Average Variance Extracted (AVE) Values

No	Variables	Code	AVE	Description
1	Training	X1	0.708	Valid
2	Work Discipline	X2	0.664	Valid
3	Job Satisfaction	Y	0.582	Valid
4	Performance	Z	0.622	Valid

Source: Results of SEM-PLS analysis of questionnaire data (processed in 2025)

Table 1 delineates the results of data processing for the Average Variance Extracted values of each construct in this study. In accordance with the criteria articulated by Hair et al. (2021), the minimum AVE threshold to be achieved is ≥ 0.50. This threshold indicates that the construct is able to elucidate at least half of the variance of its indicators. Thus, all variables in this investigation may be adjudged to have met convergent validity and to be valid measurement constructs.

The second procedure employed is the Fornell–Larcker Criterion. This method contrasts the square root of the Average Variance Extracted (AVE) with the correlations among constructs. Discriminant validity is deemed to be satisfied when the square root of the AVE for each construct surpasses the correlation of that construct with other constructs (Hair et al., 2021). These comparative figures are presented in the subsequent table.

Table 2. Average Variance Extracted Values using the Fornell-Larcker Criterion method

No	Construction	Work Discipline (X2)	Job Satisfaction (Y)	Performance (Z)	Training (X1)
1	Work Discipline (X2)	0.841			

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2	Job Satisfaction (Y)	0.447	0.815		
3	Performance (Z)	0.382	0.728	0.763	
4	Training (X1)	0.309	0.306	0.341	0.789

Source: Results of SEM-PLS analysis of questionnaire data (processed in 2025)

Based on Table 2, it can be seen that the AVE square root values of each construct are above the correlation values with other constructs and are all ≥ 0.50. This indicates that each construct in the model has adequate discriminant validity, as it is able to clearly distinguish itself from other constructs in accordance with the Fornell-Larcker criteria.

The third method is the Heterotrait-Monotrait Ratio (HTMT). According to Hair et al. (2021), HTMT is a method recommended for identifying discriminant validity issues more sensitively than other methods. Discriminant validity is met if the HTMT value between two constructs is below 0.90 for a confirmatory theory research model. The HTMT values between constructs in this study are shown below.

Table 3. Heterotrait-Monotrait Ratio (HTMT) Values

No	Construction	Work Discipline (X2)	Job Satisfaction (Y)	Performance (Z)	Training (X1)
1	Work Discipline (X2)				
2	Job Satisfaction (Y)	0.456			
3	Performance (Z)	0.392	0.755		
4	Training (X1)	0.318	0.303	0.347	

Source: Results of SEM-PLS analysis of questionnaire data (processed in 2025)

Table 3 indicates that all Heterotrait–Monotrait Ratio (HTMT) coefficients among the constructs in the model fall below the 0.90 threshold, signifying the absence of undue correlation among distinct constructs. Accordingly, these findings demonstrate that discriminant validity has been satisfied based on the Heterotrait–Monotrait Ratio criterion (Hair et al., 2021), and each construct in this study can be distinctly differentiated from the others.

Reliability Test

In evaluating the measurement model, two prevalently employed indices for appraising reliability are Cronbach's Alpha (CA) and Composite Reliability (CR). As articulated by Hair et al. (2021), reliability coefficients are deemed satisfactory when Composite Reliability ≥ 0.70, signifying that the construct exhibits robust internal coherence. Although Cronbach's Alpha is likewise utilized, Hair et al. (2021) advocate the preferential use of Composite Reliability because it accommodates the differential weighting and substantive contribution of each indicator rather than assuming equivalence among them. The reliability coefficients for the constructs examined in this investigation are delineated in the table below.

Table 4. Cronbach's Alpha and Composite Reliability Values

No	Construction	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	AVE
1	Work Discipline (X2)	0.970	0.972	0.973	0.708
2	Job Satisfaction (Y)	0.964	0.965	0.967	0.664

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3	Performance (Z)	0.948	0.951	0.954	0.582
4	Training (X1)	0.957	0.963	0.961	0.622

Source: Results of SEM-PLS analysis of questionnaire data (processed in 2025)

Based on Table 4, all constructs in the model have Cronbach's Alpha and Composite Reliability values greater than 0.70, in accordance with the criteria set by Hair et al. (2021). These results indicate that the indicators used have strong internal consistency in measuring each construct. Thus, it can be concluded that all constructs in this study have mest the internal reliability requirements and can be used for further analysis.

Structural Model Test Results (inner model)

In SEM-PLS, multicollinearity is tested by looking at the Variance Inflation Factor (VIF) of the predictor variables with the criterion that if the VIF value of an independent variable is ≤ 5.0, it can be considered that there is no serious multicollinearity. This means that the correlation between independent variables is still within acceptable limits, so that the influence of these independent variables can be clearly separated from other variables. In practice, most researchers recommend a VIF ≤ 5.0 for a safer margin, but a VIF ≤ 10.0 is still considered an acceptable limit in many studies. Table 5 below presents the VIF values for each construct in the inner model of this study.

Table 5. Variance Inflation Factor (VIF) Values

No	Construction	Work Discipline (X2)	Job Satisfaction (Y)	Performance (Z)	Training (X1)
1	Work Discipline (X2)		1.106	1.303	
2	Job Satisfaction (Y)			1.300	
3	Performance (Z)				
4	Training (X1)		1.106	1.150	

Source: Results of SEM-PLS analysis of questionnaire data (processed in 2025)

Based on Table 5, the Variance Inflation Factor (VIF) coefficients for all independent variables incorporated in the model are below the critical threshold of 5.0, with values ranging from 1.106 to 1.303. These magnitudes signify the absence of multicollinearity phenomena or unduly pronounced intercorrelations among the predictors, including Training (X1) and Work Discipline (X2). Thus, the independent variables can be regarded as sufficiently distinct, and their parameter estimates are unlikely to be biased by redundancy within the model. This means that these two variables can be analysed separately in influencing Job Satisfaction (Y) and Performance (Z) without interfering with each other. With these results, the model is declared free from multicollinearity issues, so that the analysis can proceed to the next stage, which is testing the influence between variables (path coefficient).

The next test conducted was the R-square or variance presentation test. This test was conducted to find out whether there was an effect on the dependent variables studied in this research. The following are the R-square test results presented in Table 6 below:

Table 6. Coefficient of Determination or R-square Values

No	Construct	R-square
1	Job Satisfaction (Y)	0.231
2	Performance (Z)	0.547

Source: Results of SEM-PLS analysis of questionnaire data (processed in 2025)

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The Job Satisfaction variable (Y) possesses an R-square value of 0.231, indicating that 23.1% of the variability in Job Satisfaction is elucidated by the independent variables within the model. The remaining 76.9% is attributable to other determinants beyond the purview of this investigation. Conversely, the Performance variable (Z) exhibits an R-square value of 0.547, denoting that 54.7% of the fluctuation in Performance is accounted for by the influencing variables incorporated in the model. The adjusted R-square value of 0.540 likewise corroborates that the model explicates the Performance variable adequately and with reasonable consistency. Taken together, the model demonstrates moderate predictive capacity for Performance and limited predictive capacity for Job Satisfaction, implying that extraneous variables outside the model likely exert a salient influence on Job Satisfaction.

Hypothesis Testing and Significance (Path Coefficients)

Direct Effect Hypothesis Test

This investigation employed a one-tailed testing approach with a 5% level of significance ($\alpha = 0.05$). Accordingly, a hypothesis is deemed tenable when the t-statistic exceeds 1.653 and the p-value falls below 0.05. The outcomes of this procedure furnish an indication of whether the relationships posited in hypotheses H1 through H5 attain statistical significance. The ensuing table presents the results of the SEM–PLS bootstrapping analysis.

Table 7. Path Coefficients (β), t-statistics and p-values for direct influence paths

No	Direct Influence Path	Path Coefficients (β)	t-statistics	p-value	Description
1	Training (X1) → Job Satisfaction (Y)	0.185	2.293	0.011	H1 accepted
2	Work Discipline (X2) → Job Satisfaction (Y)	0.390	3.878	0.000	H2 accepted
3	Job Satisfaction (Y) → Performance (Z)	0.671	7.048	0.000	H3 accepted
4	Training (X1) → Performance (Z)	0.122	1.998	0.023	H4 accepted
5	Work Discipline (X2) → Performance (Z)	0.044	0.520	0.302	H5 rejected

Source: Results of SEM-PLS analysis of questionnaire data (processed in 2025)

Structural Model 1:

The Effect of Training (X_1) and Work Discipline (X_2) on Job Satisfaction (Y)

$Y = \boldsymbol{\beta X1 \rightarrow Y}.\ X1 + \boldsymbol{\beta X2 \rightarrow Y}.\ X2 + e1$

$Y = \mathbf{0,185}.\ X1 + \mathbf{0,390}.\ X2 + e1$

This equation explains that the variables of Training and Work Discipline contribute directly to influencing Job Satisfaction. The value of the β coefficient shows how much influence each variable has. For example, a β value of 0.185 for Training means that when the quality of training increases by one unit, the level of job satisfaction will also increase by 0.185 units, assuming other variables remain constant. Similarly, Work Discipline with a β coefficient of 0.390 contributes more strongly to increasing job satisfaction. Thus, this model shows that both variables play an important role in shaping employees' perceptions of Aviation Security personnel job satisfaction.

Structural Model 2:

The Effect of Training (X_1), Work Discipline (X_2), and Job Satisfaction (Y) on Performance (Z)

$Z = \boldsymbol{\beta X1 \rightarrow Z}.\ X1 + \boldsymbol{\beta X2 \rightarrow Z}.\ X2 + \boldsymbol{\beta Y \rightarrow Z}.\ Y + e2$

$Z = \mathbf{0,122}.\ X1 + \mathbf{0,044}.\ X2 + \mathbf{0,671}.\ Y + e2$

This equation elucidates the extent to which Performance is conditioned by Training, Work Discipline, and Job Satisfaction. The β-coefficient values serve to explicate the relative contribution of each predictor to the enhancement of Performance. For instance, a β coefficient of 0.671 for Job Satisfaction (Y) signifies that this construct constitutes

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the most preponderant determinant in augmenting Performance (Z). Nevertheless, it should be underscored that the direct influence of Work Discipline on Performance in this model is not statistically discernible, as evidenced by a t-statistic value inferior to the critical t-value and a p-value exceeding 0.05. These finding notes that although Work Discipline remains substantively salient, its impact on Performance is more plausibly manifested indirectly via Job Satisfaction functioning as a mediating variable.

b. Hypothesis Testing for Indirect Effects

The mediation hypothesis is considered significant if the t-statistic value is greater than 1.653 and the p-value is less than 0.05.

Table 8. Path Coefficients (β) Values, t-statistics, and p-values for indirect influence paths

No	Indirect Influence Path	Path Coefficients (β)	t-statistics	p-value	Description
1	Training (X1) → Job Satisfaction (Y) →	0.261	3.275	0.001	H7 accepted
2	Performance (Z)	0.124	2.010	0.044	H8 accepted

Source: Results of SEM-PLS analysis of questionnaire data (processed in 2025)

Drawing upon Table 8 above, which delineates the outcomes of the SEM-PLS bootstrapping analysis for indirect effect pathways, it is evident that two mediational linkages are identified wherein Job Satisfaction (Y) serves as an intervening construct between the independent variables—Training (X_1) and Work Discipline (X_2)—and the dependent variable, Performance (Z). The information reported comprises Path Coefficient (β) estimates, t-statistic values, and p-values, which collectively constitute the evidentiary basis for evaluating hypotheses H7 and H8. Effect Size.

c. Effect Size Direct Effect (f2)

This test complements the path coefficients and R-square values, as it not only shows significant relationships but also the strength of their influence in the analysis of variable relationships in this study. The following are the f-square (f^2) values from this study:

Table 9. Direct influence path f-square (f^2) values

No	Direct Influence Paths	f-square (f^2)	Description
1	Training (X1) → Job Satisfaction (Y)	0.040	Minor effect
2	Work Discipline (X2) → Job Satisfaction (Y)	0.179	Moderate effect
3	Job Satisfaction (Y) → Performance (Z)	0.763	Major effect
4	Training (X1) → Performance (Z)	0.029	Minor effect
5	Work Discipline (X2) → Performance (Z)	0.003	Minor effect

Source: Results of SEM-PLS analysis of questionnaire data (processed in 2025)

Based on the effect size test results presented in the preceding table, it is apparent that the Job Satisfaction (Y) construct exhibits a markedly substantial effect size on Performance (Z), with an f^2 value of 0.763. This finding signifies that Job Satisfaction constitutes the most predominant determinant in elucidating variance in the Performance variable.

Moreover, the Work Discipline variable (X_2) demonstrates an effect size of 0.179 on Job Satisfaction (Y), placing it within the moderate-effect classification. Accordingly, it may be inferred that Work Discipline exerts a

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reasonably robust influence in augmenting Job Satisfaction. Conversely, the direct influence of Work Discipline on Performance (Z) yields an f^2 value of merely 0.003, which is categorised as negligible, indicating that it contributes an insubstantial and statistically trivial direct effect on Performance.

Meanwhile, the Training variable (X_1) has an effect size of 0.040 on Job Satisfaction (Y) and 0.029 on Performance (Z). Both of these values are still in the small effect category, but they still have a meaningful contribution in the context of this research model, especially since their influence is statistically significant in both direct and indirect path testing.

Overall, these results reinforce previous findings that Job Satisfaction is a very important mediator in mediating the influence of Training and Work Discipline on the performance of Aviation Security personnel, and that the strength of the influence of each variable is not only statistically important but also practically relevant in improving the performance quality of PT IAS Support Indonesia's Aviation Security personnel at Terminal 3 of Soekarno-Hatta Airport.

d. Effect Size of Indirect Influence (upsilon v)

According to Ougbeibu et al. (2020) and Lachowicz et al. (2018), effect size mediation needs to be reported separately because the f^2 approach does not automatically calculate the mediation effect in the output of SmartPLS version 4. The upsilon calculation is performed using the formula: $v = (\beta X \rightarrow Y)^2 \, x \, (\beta Y \rightarrow Z)^2$

The results of the effect size mediation calculation (upsilon v) in this study are presented in the following table:

Table 10. Upsilon (v) values for indirect effect paths

No	Indirect Influence Pathways	Upsilon (v)	Description
1	Training (X1) → Job Satisfaction (Y) → Performance (Z)	0.001	Small Mediation
2	Work Discipline (X2) → Job Satisfaction (Y) → Performance (Z)	0.019	Small Mediation

Source: Results of questionnaire data analysis (processed in 2025)

Based on Table 10 above, it can be seen that the path Training (X_1) → Job Satisfaction (Y) → Performance (Z) has an upsilon value of 0.001, while the path Work Discipline (X_2) → Job Satisfaction (Y) → Performance (Z) has a value of 0.019.

Both values are below the threshold for a moderate effect size ($v \geq 0.075$), so they are categorised as small mediation effects. Thus, although the mediating relationship is statistically significant, the contribution of the Job Satisfaction variable in mediating the relationship between Training and Work Discipline on Performance is relatively small. This indicates that the indirect effect does exist, but its influence is practically weak. However, the existence of this mediating effect is still important to consider in the managerial context and in developing strategies to improve the performance of Aviation Security personnel at PT IAS Support Indonesia in Terminal 3 of Soekarno-Hatta Airport.

Predictive Relevance (Q2)

In accordance with Hair et al. (2021), the Q^2 statistic is employed to evaluate whether a model possesses predictive relevance for the dependent variable. When the Q^2 value exceeds 0 ($Q^2 > 0$), the model is deemed to exhibit sufficient predictive capability. The Q^2 value is derived from the analysis of questionnaire data processed using SmartPLS. The subsequent table reports the Q^2 values for each dependent variable.

Table 11. Q-square values (Q^2)

No	Variables	Q-square
1	Job Satisfaction (Y)	0.198
2	Performance (Z)	0.157

Source: Results of SEM-PLS analysis of questionnaire data (processed in 2025)

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From the foregoing table, it may be inferred that the Job Satisfaction (Y) construct attains a Q^2 value of 0.198, signifying a moderate level of predictive capability, whereas the Performance (Z) construct records a Q^2 value of 0.157, likewise indicating moderate predictive capacity. Collectively, the structural model in this investigation demonstrates satisfactory predictive relevance for the dependent variables, particularly for Performance (Z) as the principal outcome variable. These findings further substantiate the robustness of the model in elucidating and forecasting the performance of Aviation Security personnel on the basis of job satisfaction, training, and work discipline.

Model Fit Test Results

In this study, model fit was evaluated through two main approaches, namely Standardised Root Mean Square Residual (SRMR) as a structural feasibility indicator, and PLS Predict as a predictivity-based approach. The results of these two approaches are presented sequentially below.

SRMR

The Standardized Root Mean Square Residual (SRMR) constitutes an index of model adequacy predicated on the average residual correlation between the predicted and the empirically observed indicators. A lower SRMR value denotes superior model appropriateness. Henseler et al. (2014) posit that an SRMR value of < 0.08 is indicative of a well-fitting model, whereas Hair et al. (2022) recommend an upper threshold of 0.10.

The table below encapsulates the SRMR estimation outcomes together with ancillary goodness-of-fit indices, namely d_ULS, d_G, Chi-Square, and the Normed Fit Index (NFI).

Table 12. SRMR and NFI Values

No	Fit Index	Saturated Model	Estimated Model
1	SRMR	0.067	0.067
2	d_ULS	8.143	8.143
3	d_G	6.536	6.536
4	Chi-square	4964.717	4964.717
5	NFI	0.653	0.653

Source: Results of SEM-PLS analysis of questionnaire data (processed in 2025)

The table results show that the SRMR value is 0.067, which is below the threshold of 0.08, so it can be concluded that the model in this study has good structural suitability. In addition, the NFI value of 0.653 also indicates an acceptable level of suitability.

CONCLUSION

Based on the results of the research conducted, it can be concluded that descriptively, the variables of training, work discipline, job satisfaction, and performance of Aviation Security personnel at Terminal 3 of Soekarno-Hatta Airport are in the high to very high category. Training was rated highly by respondents, especially in terms of the quality of training methods, although there were still weaknesses in training facilities and equipment. Work discipline is also in the high category, with the main strength being punctuality, while responsibility in completing tasks is the lowest aspect. Job satisfaction is in the very high category, especially in terms of relationships with co-workers, although the aspect of supervision still needs to be improved. The performance of Aviation Security personnel is also in the very high category, with initiative being the most prominent aspect and work quantity being the lowest aspect.

The results of testing the relationship between variables show that training has a positive and significant effect on job satisfaction. Quality training not only improves the technical abilities of personnel, but also builds confidence

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and psychological satisfaction at work. Although the magnitude of the effect is in the small category, training remains an important element in creating comfort and job satisfaction, especially in high-risk work environments such as the aviation security sector. In addition, work discipline has also been proven to have a positive and significant effect on job satisfaction with a moderate level of influence, indicating that the implementation of strict, consistent, and clear rules can create a sense of security and a work climate that is appreciated by personnel.

Job satisfaction has a very strong influence on the performance of Aviation Security personnel. Personnel who are satisfied with their work environment, reward system, and working relationships tend to demonstrate motivation, responsibility, and optimal work performance. This confirms that job satisfaction is a key factor in ensuring professionalism and consistency of performance in the aviation security sector. Meanwhile, training also has a positive effect on performance, although the direct effect is relatively small. Training serves as the foundation for improving competence and work readiness, the impact of which on performance will be more optimal when accompanied by increased job satisfaction.

Conversely, work discipline does not show a significant direct influence on the performance of Aviation Security personnel. This finding indicates that discipline alone does not automatically improve performance without the support of other factors, such as job satisfaction and intrinsic motivation. Nevertheless, training and work discipline simultaneously contribute to performance, both directly and indirectly through job satisfaction. Training and work discipline are also proven to have an indirect effect on performance through job satisfaction as a mediating variable, albeit with a relatively small mediation effect value. This shows that an integrated human resource management approach between training, strengthening fair and humane discipline, and increasing job satisfaction is essential to achieve optimal and sustainable Aviation Security personnel performance.

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