

THE INFLUENCE OF AUTOMATION AND WORKING CONDITION ON PILOT'S JOB SATISFACTION AT GARUDA INDONESIA

Yasinta Putri Cinta Aryanti^a, Liana Marsiela^b, Aditya Wardhana^c, Yuliantini^d

Faculty of Management and Business, Institut Transportasi dan Logistik Trisakti,
Jakarta, Indonesia

Corresponding author: putricinta2104@gmail.com

Abstract: Job satisfaction is a crucial aspect that can enhance the loyalty and productivity of employees. In the aviation context, the pilot's job satisfaction is important in human resource areas yet maintaining favourable working conditions and increasing usage rate of automation technology remain as challenges at Garuda Indonesia. This research aims to study the influence of automation and working conditions on pilot's job satisfaction at Garuda Indonesia. The data from 40 pilots at Garuda Indonesia was collected through an online survey and analysed using quantitative methods through Structural Equation Modelling (SEM) PLS. The results from analysed data show that automation has indirect influence on job satisfaction and strong positive direct influence on working condition. Moreover, working condition has a moderate positive influence on job satisfaction.

Keywords: *Automation, Working Condition, Job Satisfaction, Pilot, Airlines*

1. Introduction

Job satisfaction is proven to be one of the most important factors that contributes to the success of any business, as a high rate of employee contentedness is associated directly to a lower turnover rate (Gregory, 2011). This lower rate of turnover, which is caused by more loyal and productive employees, will result to customer satisfaction and an overall improved productivity of an organization (Sageer et al., 2012). This importance of job satisfaction also applies in the industry of aviation, as it mainly sells services to passengers which requires employees' motivation. Furthermore, pilot, along with their performance, has been playing a prominent role in aviation human resource for over half a century. Hence, pilot's satisfaction is crucial to evaluate and maintain (Ahmad et al., 2012).

In the case of Garuda Indonesia, automation has been majorly applied in their operation of all the flight plans, computer-generated by Jeppesen in the USA. This flight plan is called Computerized Flight Dispatch (CFD). CFD refers to an automated information system which operates weather information (excluding wind data) from throughout Indonesia that is reported manually to Flight Dispatch on a hourly basis from all domestic station managers (Clarke & Naryadi, 1995).

Reflecting from selection tests used over the years by the study of Ahmad et al. (2012), there have been various factors that are perceived as impacting satisfaction of a pilot in civil

aviation. One of them is digitalization, which defines to be an advanced-level technology that puts a significant impact in improving industrial performance and convenience to the daily lives of many people (La et al., 2021). In the use of automation systems as form of digitalization, job satisfaction is important towards productivity due to ethical reasons and its positive influence. As the world becoming highly digitalized, the promotion of job satisfaction remains relevant in context of Industry 4.0 especially since humans still hold higher cognitive capabilities compared to robots and machines (Villani et al., 2021). Due to this reason, the research aims to answer:

- A. How do the automation and working condition influence the job satisfaction of pilots at Garuda Indonesia?

This research assumes that the automation influences job satisfaction and working environment. It also assumes that working condition also influences job satisfaction.

2. Literature review

Automation is a form of digitalization (Siderska, 2020) which points out the foreground of efficiency, productivity, quality, and reliability. It focuses on systems that autonomously operated, usually in structured environments within periods (Parasuraman et al., 2000). Automation is also defined to be the utilization of technologies that include control systems and information systems which are purposed to decrease the amount of work done by humans in producing services and goods. The concept of automation involves replacing specific tasks that were previously carried out by humans with an automatic system. In aviation, it includes autopilot devices, computers, automated flight management systems, flight directors, warning and alerting systems, and auto-throttles (Brown, 2016).

Previous study suggests that automation positively and negatively affects job satisfaction. For instance, Schwabe & Castellacci (2020) argues that automation negatively influences job satisfaction since it induces the fear of being replaced in the future, especially towards the employees that are more vulnerable to the risks of automation. Additionally, Bhargava et al. (2021) claims that automation causes job satisfaction dilemma as some employees will be displeased with the implementation of automation in the workplace even though most of them are satisfied with the advantages of automation. The subjective impact of automation depends on the level of skill and seniority. Moreover, automation can simultaneously cause job satisfaction paradox as the replacement and improvement effects are able to coexist based on individual preferences and job characteristics (Chen & Li, 2024).

The utilization of automation is also closely related to the working conditions of an organization. According to Christensen et al. (2020), there is a significant influence of automation as a part of digitalization in determining the psychosocial working environment, occupational health, and over-all well-being of a worker. Upon this far-reaching influence of automation towards working conditions, Pham et al. (2018) elaborated that it might help eliminating harsh and dangerous work. Regardless, it is also stated that automation might

cause several negative influences caused by unmatched working pace, adjustment time to automation, and as well as other inconveniences. This will lead to the level of worker's job satisfaction level as the result of the employment demand, wages, daily tasks, the threat to be replaced by the automation, and as well as the increased productivity (Schwabe & Castellacci, 2020).

Working conditions are a term used to describe factors that occur in a workplace that have significant influence on a worker's quality of life. As workers have most of their time spent working, it may extend its influence on other areas of their personal life, including daily activities like eating, sleeping, to developing interpersonal relationships. In other definition, working condition refers to such arrangements that define condition in a particular workplace, namely the layout of the room, set of lighting, level of cleanliness, and the control of its air quality. These areas combined can become factors that strongly influence the performance and satisfaction of a worker (Efawati, 2020). Furthermore, working conditions may affect the physical and mental health of a worker, leading to it influencing workers' satisfaction in conducting their job (Joon et al., 2014). According to Bakotić & Babić (2013), working conditions are shown to have a link to workers' job satisfaction. In maximizing job satisfaction, working conditions impact several environmental and organizational factors that are inline primarily to the production of an organization. Bakotić & Babić (2013) also show several past studies that have dealt with the working conditions as a factor of job satisfaction elaborates that worker likes non-dangerous and unpleasant working. It means that they prefer working conditions that resemble the conditions that they have in their homes.

Job satisfaction is a behavior that generally resulted from three common factors, which are specific job, characteristics of individual, and outside job's group relationships. To analyze job satisfaction, these three factors cannot be separated from each other (Mishra, 2013). The recent most used definition of job satisfaction as proposed by Locke (1969) and cited by Villani et al. (2021) refers to the pleasant or positive state of emotion arising from employee's assessment of their job experience, while job dissatisfaction refers to the negative or unpleasant emotion caused by a job. Both job satisfaction and dissatisfaction represent the gap between employees' perception of their desires and benefits gained from a job. Spector (2012) suggests that the ideal alignment between an employee and their job is the fundamental reason behind job satisfaction, as cited in the study by Demirkol & Nalla (2018). Job satisfaction is important to organizations since it affects employee performance, organizational effectiveness, and employee turnover rate. Moreover, a satisfied employee tends to work beyond their task to become ambassador and advocate for the organization (Judge et al., 2020). In aviation context, Pahrudin et al. (2018) highlights the importance of job satisfaction as the industry has the characteristics of service intensive and high human capital cost.

Table 1
The Variable of Measurement

Variable	Operational definition	Dimensions	Source
Automation	The employees' perception towards automation	1. Change in Time Use 2. New Activities 3. Access to Information 4. Communication Tools	(Bolli & Pusterla, 2022) based on (Castellacci & Tveito, 2018)
Working Condition	The environmental condition of employees' working space	1. Physical Working Conditions 2. Psychosocial Working Condition	(Villani et al., 2021)
Job Satisfaction	The employees' feelings arising from their job experience	1. Pleasant Mood 2. Affectivity 3. Experience-sampled job satisfaction 4. General Job Satisfaction 5. Job Beliefs	(Judge et al., 2020) based on (Ilies & Judge, 2004)

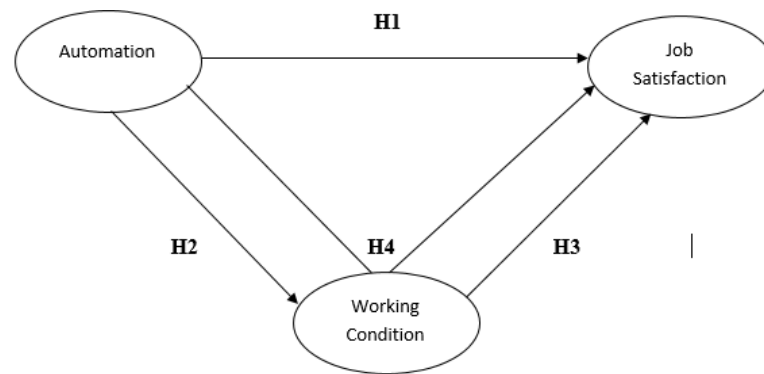


Figure 1. Research Model

Table 2
Research Hypothesis

NO	RESEARCH HYPOTHESIS	
H₁	H ₀	There is no significant influence of Automation towards Job Satisfaction
	H ₁	There is a significant influence of Automation towards Job Satisfaction
H₂	H ₀	There is no significant influence of Automation towards Working Condition
	H ₂	There is a significant influence of Automation towards Working Condition
H₃	H ₀	There is no significant influence of Working Condition towards Job Satisfaction
	H ₃	There is a significant influence of Working Condition towards Job Satisfaction
H₄	H ₀	There is no significant influence of Automation towards Job Satisfaction through Working Condition
	H ₄	There is a significant influence of Automation towards Job Satisfaction through Working Condition

3. Research method

The research employed a quantitative method in a non-contrived setting based on quantification of variables measured. The population of this research were the pilots of Garuda Indonesia Airline. The sampling technique used was a non-probability purposive sampling method. The authors created and shared the questionnaire through an online survey instrument in August 2024. In this period, the answer from 40 sampling respondents from active pilots of Garuda Indonesia was gathered. The online survey contains 43 questions including 38 questions that measure the respondent's perception towards variables studied with Likert Scale from 1-5 where 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree. Afterwards, the data collected was analyzed using Structural Equation Model (SEM) with SMART-PLS 4 software as the data analysis tool. SEM facilitates the simultaneous modeling and estimation of complex relationships among multiple dependent and independent variables. The constructs under investigation are often latent and are indirectly assessed through multiple indicator variables. By incorporating measurement error in observed variables, SEM enhances the precision of measuring the theoretical constructs of interest. However, SEM has limitation due to the inability to test causal relationships between the indicators that constitute the latent variables (Hair et al., 2022).

4. Results and discussion

From the data collected, the characteristics of respondents are pilots who are actively working at Garuda Indonesia Airline in Indonesia. The demographics of respondents are classified into several groups consisting of age, gender, years of working in the company, and automation training recipients. The data has been summarized as follows:

Table 3
Demographics of Respondents Based on Age

Age	Amount (Pilots)	Percentage
21-25	2	5%
26-30	30	75%
31-35	6	15%
36-40	2	5%
Total	40	100%

The age groups of respondents were classified into 4 groups. The finding shows that the mode of age group in this study was 26-30 with the percentage of 75%. This number is then followed by the age group of 31-35 at 15%, the age group of 21-25 at 5% and the age group of 36-40 also at 5%.

Table 4
Demographics of Respondents Based on Gender

Gender	Amount (Pilots)	Percentage
Male	34	85%
Female	6	15%
Total	40	100%

The proportion of respondents in this study was dominated by males at 85% whereas the proportion of female respondents was only 5%.

Table 5
Demographics of Respondents Based on Years of Working in the Company

Duration	Amount (Pilots)	Percentage
Less than 5 years	25	62.5%
More than 5 years	15	37.5%
Total	40	100%

Table 6

Demographics of Respondents Based on Automation Training Recipients

Training	Amount (Pilots)	Percentage
Untrained	5	12.5%
Trained	35	87.5%
Total	40	100%

The respondents also consisted of 62.5% of pilots who have worked less than 5 years in the company and 37.5% of pilots who have worked more than 5 years in the company. Moreover, from all respondents, only 12.5% of pilots have not received any training regarding automation as opposed to 87.5% of pilots who have received it.

Evaluation of Measurement Model

In evaluation of the measurement model, 22 items of indicators that had low outer loadings were removed to reach the minimum Average Variance Extracted (AVE) and Composite Reliability values. Those items are AT1, AT2, AT3, AT4, WC1, WC2, WC3, WC4, WC5, WC6, WC7, WC8, WC9, WC10, WC11, WC12, WC14, WC19, WC20, WC21, WC22, WC23, WC24 and JS4. This action was done to comply with the standard that states the value of Outer Loadings ≥ 0.708 . Moreover, the standard set the values of Cronbach's Alpha and the Composite Reliability ≥ 0.70 , Average Variance Extracted (AVE) > 0.50 , and Heterotrait-Monotrait Ratio (HTMT) < 0.90 as the value above 0.90 indicates an absence of discriminant validity (Hair et al., 2022).

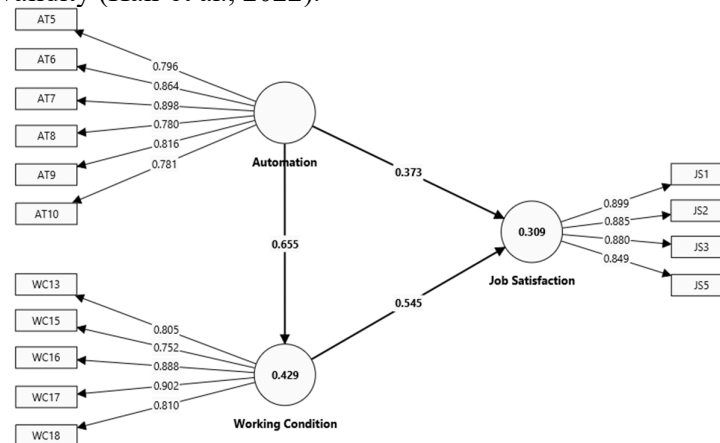


Figure 2. Research Model

Table 7

Outer Loading, Composite Reliability (CR), Cronbach's Alpha (CA), and Average Variance Extracted (AVE)

Variable	Item	Outer Loadings	CR	CA	AVE
AT	AT5	0.796	0.934	0.906	0.678
	AT6	0.864			
	AT7	0.898			
	AT8	0.780			
	AT9	0.816			
	AT10	0.781			
WC	WC13	0.805	0.894	0.889	0.694
	WC15	0.752			
	WC16	0.888			
	WC17	0.902			
	WC18	0.810			
JS	JS1	0.899	0.915	0.902	0.772
	JS2	0.885			
	JS3	0.880			
	JS5	0.849			

The automation variable was measured using ten indicators, but 4 was deleted due to low outer loadings. The remaining six indicators have the values of Outer Loadings ranging from 0.780 to 0.898, Composite Reliability at 0.934, Cronbach's Alpha at 0.906, and AVE at 0.678. These numbers prove that the construct is valid and reliable. However, the high number of CR and CA may suggest the presence of redundant items.

Then, the working condition variable was measured using 24 indicators, but 19 had to be removed because of low outer loadings. The remaining five indicators have the values of Outer Loadings between 0.752 and 0.902, composite reliability at 0.894, Cronbach's Alpha at 0.889, and AVE at 0.694. These values met all the minimum criterion which indicates the validity and reliability of the construct.

Lastly, the job satisfaction variable was measured using five indicators, but one was eliminated due to low Outer Loadings. The remaining four indicators have the values of

Outer Loadings ranging from 0.849 to 0.899, Composite Reliability at 0.915, Cronbach's Alpha at 0.902, and AVE at 0.772. These values confirmed the validity and reliability of the construct although the high number of CR and CA may indicate redundancy of some items.

Table 8

HTMT (Heterotrait-Monotrait Ratio)

	AT	JS	WC
AT			
JS	0.396		
WC	0.681	0.609	

In evaluating discriminant validity, the findings show that the HTMT value of job satisfaction on automation is 0.396, followed by working condition on automation at 0.681, and working condition on job satisfaction at 0.609. The three HTMT values are below the maximum HTMT value of 0.90, which means the constructs are empirically distinct.

Structural Model Evaluation

The term multicollinearity is an occurrence of high correlation between two or more of formative indicators, which can be detected with Variance Inflation Factor (VIF). The multicollinearity is detected when the VIF value is greater than 5. Furthermore, Structural Model Evaluation also includes hypothesis testing by calculating whether the T-statistics value is lower than -1.96 or higher than 1.96 and whether the P-value is less than 0.05 (Hair et al., 2022).

Table 9

VIF Value and Hypotheses Testing (Direct Effect & Indirect Effect)

	VIF	Original Sample	Sample Mean	Standard Deviation	T-Statistics	P-Values	Results
H1: AT→JS	1.753	0.016	-0.002	0.250	0.063	0.949	Rejected
H2: AT→WC	1.000	0.655	0.677	0.070	9.300	0.000	Accepted
H3:	1.753	0.545	0.533	0.193	2.825	0.005	Accepted

WC→JS

H4:

AT→WC→JS	-	0.357	0.357	0.141	2.533	0.011	Accepted
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The table above shows that the VIF value of both automation and working condition towards job satisfaction is at 1.753. Then the value for automation towards working condition is at 1.000. Since all the VIF values are below 5, multicollinearity is absent in this model. The result of hypothesis testing based on the numbers of original sample, sample mean, standard deviation, T-statistics, and P-values are summarized in the following:

1. H1: Rejected. Accept H0: There is no significant influence of Automation towards Job Satisfaction. (Original Sample = 0.016, T-statistics = 0.063 and P value = 0.949)
2. H2: Accepted. There is a significant influence of Automation towards Working Condition. (Original Sample = 0.655, T-statistics = 9.300, and P value = 0.000)
3. H3: Accepted. There is a significant influence of Working Condition towards Job Satisfaction. (Original Sample = 0.545, T-statistics = 2.825, and P value = 0.005)
4. H3: Accepted. There is a significant influence of Automation towards Job Satisfaction through Working Condition. (Original Sample = 0.357, T-statistics = 2.533, and P value = 0.011)

Additionally, the value of coefficient of determination (R^2) and F^2 are used in determining the extent of influence of independent variables towards dependent variable. The common guidelines state that the minimum required value of R^2 is usually at 0.65. However, some disciplines consider the value of R^2 as satisfactory even when it is as low as 0.10. Hair et al. (2011) explained that the value of R^2 as weak, moderate, and substantial at the value of 0.25, 0.50, and 0.75 respectively. In model assessment, the numbers of F^2 the values at 0.02, 0.15, and 0.35 represent small, moderate, and strong effects respectively (Hair et al., 2022).

Table 10

F-square (direct effect)

	F-square	Result
H1: AT→JS	0.000	None
H2: AT→WC	0.753	Strong
H3: WC→JS	0.245	Moderate
H4: AT→WC →JS	-	-

In accordance with the hypotheses testing result and as shown in table 10, H1 has F^2 of 0.000, meaning that the influence of automation towards job satisfaction is none as automation does not directly influence job satisfaction. H2 has the value of F^2 at 0.753, meaning that automation has strong influence towards the variable working condition. H3 has the value of F^2 at 0.245, meaning that working has moderate influence towards job satisfaction. Lastly, the effect size for H4 is unknown as SMART-PLS 4 only shows size effect for direct effect.

Table 11

R-square

	R-square	Result
JS	0.309	Moderate
WC	0.429	Moderate

Finally, based on the table 11, the value of R^2 for job satisfaction is at 0.309, which implies that the endogenous latent variables in the structural model of job satisfaction are categorized as moderate. It also means that the endogenous construct in the structural model can explain 30.9% of the job satisfaction variance. Moreover, the value of R^2 for working condition is at 0.429. It implies that the endogenous latent variables in the structural model of working

condition are categorized as moderate. It also means that the endogenous construct in the structural model can explain 42.9% of the working condition variance.

Discussion

The result in this research shows that while automation does not directly influence job satisfaction, it has strong positive direct influence towards the variable of working condition. The result also reveals that automation has indirect influence towards job satisfaction. Moreover, the variable of working condition has positive moderate direct influence towards job satisfaction. Schwabe & Castellacci (2020), Bhargava et al. (2021) argue that automation can either positively or negatively influence job satisfaction. Regardless, the result in the case of Garuda Indonesia unexpectedly shows that the influence of automation towards job satisfaction is indirect instead of direct one. In addition, the strong positive influence of automation towards working condition conforms with Christensen et al. (2020) that state the significance of the influence of automation in determining the working condition. This finding implies that the impact of automation is intricate and might necessitate more thorough examination. Furthermore, the moderate positive influence of working condition towards job satisfaction shows that the environmental and organizational factors are linked to worker's job satisfaction in conducting their job (Joon et al., 2014). All of the findings in this study suggest that at Garuda Indonesia, automation and working condition are favourable, thus positively influence the job satisfaction.

5. Conclusion

The rate of automation in the aviation industry has become prevalent. At Garuda Indonesia, automation does not directly influence job satisfaction of sampled pilots. Instead, it has indirect influence towards job satisfaction as well as strong and positive direct influence towards working conditions among sampled pilots. The findings in this research suggest that the influence of automation is complicated and may require more complex analysis. Moreover, the research found a moderate positive influence of working conditions on job satisfaction. Consequently, ensuring a favorable working condition in the workplace, focusing on both physical and psychosocial aspects remains critical in the aviation industry.

6. Implications

Based on the research result, it can be concluded that while automation's direct impact on job satisfaction was not evident in this study, working conditions emerged as a crucial at Garuda Indonesia. Therefore, some recommended practical implications in this study are:

1. Although indirect, the positive influence of automation on job satisfaction remains significant. Therefore, the usage of automation should be carefully considered by the stakeholders at Garuda Indonesia.
2. General working conditions have a significant impact on job satisfaction. Hence Garuda Indonesia should focus on creating and maintaining favorable working condition for the

pilots. By taking strategy that improves physical and especially psychosocial aspects in the workplace as it can enhance pilot's job satisfaction.

3.

7. Research limitations

Internal information access within Garuda Indonesia was restricted. Moreover, this study used questionnaire to collect data. The results represent the respondents' perception towards measured variables. Due to relatively short period of data collection, this study was carried out with a small sample of active pilots from Garuda Indonesia, targeting a specific demographic group. Therefore, the result of this study may not be generally applicable in the great amount of population. This research also could not meet the internal requirement to cite 10 articles from internal database due to the lack of discussion in this topic. Future research may explore other parameters of automation and other variables that appropriately fit the context of job satisfaction in aviation. The size of sample and respondent characteristics can be enlarged and specified. In addition, the object of research may be changed into aviation workers in other department such as ground handling crew or flight attendant.

References

- Ahmad, M. B., Wasay, E., & Malik, S. U. (2012). Impact of Employee Motivation on Customer Satisfaction: Study of Airline Industry in Pakistan. *Interdisciplinary Journal of Contemporary Research in Business*, 4(6), 531-539. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2183591
- Bakotić, D., & Babić, T. (2013). Relationship between Working Conditions and Job Satisfaction: The Case of Croatian Shipbuilding Company. *International journal of business and social science*, 4(2), 206-213.
- Bhargava, A., Bester, M., & Bolton, L. (2021). Employees' perceptions of the implementation of robotics, artificial intelligence, and automation (RAIA) on job satisfaction, job security, and employability. *Journal of Technology in Behavioral Science*, 6(1), 106-113. <https://doi.org/10.1007/s41347-020-00153-8>
- Bolli, T., & Pusterla, F. (2022). Decomposing the effects of digitalization on workers' job satisfaction. *International Review of Economics*, 69(2), 263-300. <https://doi.org/10.1007/s12232-022-00392-6>
- Brown, J. P. (2016). The effect of automation on human factors in aviation. *The Journal of Instrumentation, Automation and Systems*, 3(2), 31-64. <https://doi.org/10.21535/jias.v3i2.916>
- Castellacci, F., & Tveito, V. (2018). Internet use and well-being: A survey and a theoretical framework. *Research policy*, 47(1), 308-325. <https://doi.org/10.1016/j.respol.2017.11.007>

- Chen, F., & Li, R. (2024). Improvement and Replacement: The Dual Impact of Automation on Employees' Job Satisfaction. *Systems*, 12(2), 46. <https://doi.org/10.3390/systems12020046>
- Christensen, J. O., Finne, L. B., Garde, A. H., Nielsen, M. B., Sørensen, K., & Vleeshouwes, J. (2020). *The influence of digitalization and new technologies on psychosocial work environment and employee health: a literature review*. STAMI-rapport.
- Clarke, M., & Naryadi, Y. (1995). *The Airline Operation Control Centre: an overview of Garuda's Operation Control (EM) at Cengkering Jakarta, Indonesia: final report to PT Garuda Indonesia*. Massachusetts Institute of Technology, Flight Transportation Laboratory. Cambridge: Massachusetts Institute of Technology. Retrieved from <http://hdl.handle.net/1721.1/68155>
- Demirkol, I. C., & Nalla, M. K. (2018). Predicting job satisfaction and motivation of aviation security personnel: a test of job characteristics theory. *Security Journal*, 31, 901-923. <https://doi.org/10.1057/s41284-018-0137-2>
- Efawati, Y. (2020). The Influence of Working Conditions, Workability and Leadership on Employee Performance. *International Journal Administration Business and Organization*, 1(3), 8-15. <https://doi.org/10.61242/ijabo.20.40>
- Gregory, K. (2011). The Importance of Employee Satisfaction. *The Journal of the Division of Business & Information*, 5, 29-37. Retrieved from https://dlwqtxtslxzle7.cloudfront.net/33282172/Gregory-libre.pdf?1395477987=&response-content-disposition=inline%3B+filename%3DThe_Importance_of_Employee_Satisfaction.pdf&Expires=1727112041&Signature=SHyk5RqNVjm-fqdkDzI6NZu85UYF4FS86im~ExbUES6obm7UcPUptOT
- Hair, J. F., Hult, G. T., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM)*. SAGE Publications, Inc.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a Silver Bullet. *Journal of Marketing Theory and Practice*, 19(2), 139-152. <https://doi.org/10.2753/MTP1069-6679190202>
- Ilies, R., & Judge, T. A. (2004). An experience-sampling measure of job satisfaction and its relationship with affectivity, mood at work, job beliefs, and general job satisfaction. *European Journal of Work and Psychology*, 13(3), 367-389. <https://doi.org/10.1080/13594320444000137>
- Joon, B. L., Park, S. G., Hwang, S. H., Min, K. B., & Min, J. Y. (2014). The Relationship between working condition factors and well being. *Annals of Occupational and Environmental Medicine*, 26, 1-8. <https://doi.org/10.1186/s40557-014-0034-z>

- Judge, T. A., Zhang, S. C., & Glerum, D. R. (2020). Job Satisfaction. In V. I. Sessa, & N. A. Bowling, *Essentials of Job Attitudes and Other Workplace Psychological Constructs* (pp. 207-241). New York: Routledge.
- La, J., Bil, C., & Heiets, I. (2021). Impact of digital technologies on airline operations. *Transportation Research Procedia*, 56, 63-70. <https://doi.org/10.1016/j.trpro.2021.09.008>
- Locke, E. A. (1969). What is job satisfaction? *Organization Behavior and Human Performance*, 4(4), 309-336. [https://doi.org/10.1016/0030-5073\(69\)90013-0](https://doi.org/10.1016/0030-5073(69)90013-0)
- Mishra, P. K. (2013). Job Satisfaction. *IOSR journal of humanities and social science*, 14(5), 45-54.
- Pahrudin, C., Marina, S., & Agusinta, L. (2018). Kepemimpinan Etis, Karakteristik Pekerjaan, dan Kepuasan Kerja Karyawan Maskapai Penerbangan. *Jurnal Manajemen Transportasi & Logistik (JMTRANSLOG)*, 5(2), 117-128.
- Parasuraman, R., Sheridan, T. B., & Wickens, C. D. (2000). A model for types and levels of human interaction with automation. *IEEE Transactions on systems, man, and cybernetics-Part A: Systems and Humans*, 30(3), 286-297. <https://doi.org/10.1109/3468.844354>
- Pham, Q. C., Madhavan, R., Righetti, L., Smart, W., & Chatila, R. (2018). The impact of robotics and automation on working conditions and employment. *IEEE Robotics & Automation Magazine*, 25(2), 126-128. <https://doi.org/10.1109/MRA.2018.2822058>
- Sageer, A., Rafat, S., & Agarwal, P. (2012). Identification of Variables Affecting Employee Satisfaction and Their Impact on the Organization. *IOSR Journal of business and management*, 5(1), 32-39. <https://doi.org/10.9790/487X-0513239>
- Schwabe, H., & Castellacci, F. (2020). Automation, workers' skills and job satisfaction. *PLoS ONE*, 15(11). <https://doi.org/10.1371/journal.pone.0242929>
- Siderska, J. (2020). Robotic Process Automation—a driver of digital transformation? *Engineering Management in Production and Services*, 12(2), 21-31. <https://doi.org/10.2478/emj-2020-0009>
- Spector, P. E. (2012). *Industrial and organizational psychology: Research and practice*. Hoboken: John Wiley & Sons.
- Villani, V., Sabattini, L., Żołnierczyk-Zreda, D., Mockało, Z., Barańska, P., & Fantuzzi, C. (2021). Worker satisfaction with adaptive automation and working conditions: a theoretical model and questionnaire as an assessment tool. *International Journal of Occupational Safety and Ergonomics*, 27(4), 1235-1250. <https://doi.org/10.1080/10803548.2021.1899649>