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The Role of Labour Productivity in the Influence of E-HRM on Sustainability Performance with Organizational Agility as a Moderating Variable in MSMEs

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Abstract: In this era, technological advances benefit many aspects of work, including Human Resources Management (HRM). Implementing E-HRM helps organizations improve efficiency, reduce paper waste, and support sustainability principles. The study aims to examine the impact of E-HRM on Sustainability Performance, mediated by Labour Productivity and moderated by Organizational Agility. The research was conducted on MSMEs in Batam City, using a purposive sampling technique to obtain primary data from 200 respondents by distributing G-From questionnaires. The quantitative analysis method used is SmartPLS software. The research results of the hypothesis that shows a direct and significant positive effect on Sustainability Performance is Labor Productivity. Meanwhile, E-HRM implementation has a positive, not significant, effect on Sustainability Performance but has a positive, significant impact on Labour Productivity. The proven indirect research hypothesis is the relationship between E-HRM implementation and Sustainability Performance mediated by Labor Productivity. The theory that E-HRM implementation significantly positively affects Labour Productivity through moderation of organizational agility has yet to be proven. This research is expected to cover a broader range of research and can be used as a reference for other studies.

Keywords: E-HRM; Labour Productivity; MSMEs; Organizational Agility; Sustainability Performance

INTRODUCTION

The industrial era 4.0 is certainly not a new thing anymore in this day and age. The industrial era 4.0 has been trendy in academia and industry (AL-Zyadat et al., 2022). Almost all human activities are assisted by technology to be more effective and efficient. Of course, this applies to the work industry, too. Almost all work industries use technology systems to help complete work more effectively and efficiently. With the help of technology, companies can improve performance and sustainability and also maintain a good image of the company (Alhalalmeh et al. (2020); Al-Shorman et al. (2021); Al-Hawary & Obiadat (2021); Tariq et al. (2022); AlHamad et al. (2022)). Industry 4.0 emphasizes the tight integration of society into industrial processes for sustainable development, as well as an emphasis on value-added tasks and waste minimization. Moreover, Turner et al. (2022) also suggest that with technological advances, it must adapt and keep up with technological developments properly. Otherwise, it will be defeated by technology.

Technological advances already available in this era benefit many aspects of work, including Human Resources Management (HRM). Integrating new technologies such as artificial intelligence, mobile positioning, and facial recognition in human resource management is a significant trend in the digital era (Zhang, 2023). Due to technological advances, Human Resources Management (HRM) must be able to adapt to technology to deal with any changes in employee attitudes in working for the company, increasing effectiveness, success, creativity, and competence (Almashyakhi, 2022). One of the most significant advances in Human Resources Management (HRM) is Electronic Human Resources Management (E-HRM). Electronic Human Resources Management (E-HRM) has significantly impacted organizational success and sustainability (Athithya

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et al., 2020). E-HRM incorporates a combination of HRM and IT, resulting in benefits for managers and employees (Cheng & Hackett (2019); Connelly et al. (2021)). E-HRM, which uses technology for various HR functions, has been shown to improve workforce training management, especially in terms of transparency, traceability, and efficiency, and uses technology to recruit, train, conduct performance reviews, and career advancement and progression of employees in the company (Athithya et al., 2020).

E-HRM is very helpful for HRD in doing their job (Almashyakhi, 2022). E-HRM facilitates various HRM processes, such as recruitment, training, performance evaluation, and payroll online (Javed et al., 2023). E-HRM implementation helps organizations improve efficiency, reduce paper waste, and support sustainability principles (Rahman & Hosain, 2021). E-HRM practices utilize diverse digital tools and technologies for human resources management (De Alwis et al., 2022). Organizational Agility refers to a company's capability to swiftly adapt to environmental changes and capitalize on opportunities (Attar & Kareem, 2020). Implementing E-HRM contributes to sustainable organizational success by balancing economic, social, and environmental considerations to achieve sustainable performance (Anwar & Abdullah, 2021). E-HRM also certainly benefits employees significantly, with E-HRM employees being facilitated in many ways. Of course, it will increase labor productivity and employee job satisfaction and positively impact the company in the present and future (Zhou et al., 2023).

Based on the research results from AlNawafleh et al. (2022), E-HRM practices can help organizations achieve a sustainable environment by balancing economic, social, and environmental integration. AlNawafleh et al. (2022) also revealed that the impact of E-HRM on HRM can help organizations achieve sustainability and organizational effectiveness, and E-HRM competencies have been recognized for incorporating sustainability at various levels of the organization. According to Javed et al. (2023), parts of E-HRM, such as E-compensation and benefits, E-training, E-performance management, and E-recruitment and selection, also make it easier for organizations to carry out organizational sustainability and can improve Sustainability Performance in organizations.

Research from Nurshabrina & Adrianti (2020) shows a positive relationship between E-HRM and Labor Productivity from practitioner surveys. E-HRM practices can provide a more efficient and effective way to carry out HR processes, thus potentially resulting in higher Labor Productivity (Shah et al., 2020). E-HRM is about more than just utilizing technology for HRM processes. The primary purpose of E-HRM is to increase employee productivity, which is part of labor productivity (Hoq, 2021). Nurshabrina & Adrianti (2020) argue that the more E-HRM practices are implemented in the workplace, the more likely the company will increase productivity. Therefore, E-HRM directly and positively impacts employee perceptions of Labor Productivity.

The relationship between the two can be highly relevant, as improving Labour Productivity can positively impact an organization's Sustainability Performance (Barrymore & Sampson, 2021). Research consistently highlights the importance of Sustainability Performance in organizations, especially with Labour Productivity. Souza et al. (2021) emphasized that sustainability can create a competitive advantage and promote a discrimination-free and environmentally friendly work environment. Increasing Labour Productivity will help organizations achieve Sustainability Performance (AlNawafleh et al., 2022).

Implementing E-HRM in an organization will undoubtedly increase Labour Productivity, and with the increase in Labour Productivity, the organization will achieve sustainable performance (AlNawafleh et al., 2022). Technological change increases Labour Productivity (Iqbal et al., 2019). E-HRM contributes to technological efforts and sustainability from the point of view of technological development (Rahman & Hosain

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(2021); Shamout et al. (2022)). Based on Saxena & Khandelwal (2022) and Bril et al. (2021), organizational innovation activities (both product and process innovation) help increase HR employee productivity, which has a positive impact on Sustainability Performance. E-HRM also makes the working time of managers and other employees more efficient and effective and helps to make better and more informed decisions. E-HRM supports organizations in increasing labor productivity to achieve organizational sustainability performance (Shamout et al., 2022).

Organizational Agility can be helped by implementing E-HRM, which has a fast and effective response to changes in the organization (Thathsara & Sutha, 2021). E-HRM is flexible, cost-effective, and more strategic in managing all processes, activities, data, and information needed for organizational sustainability (Khammadee, 2023). By implementing E-HRM, of course, labor productivity will increase because it will make it easier for employees to work. More agile organizations tend to perform better in labor productivity because they can respond to change and take advantage of technology (AlNawafleh et al., 2022). Several researchers have confirmed that E-HRM improves organizational capabilities, performance, and sustainability (Bag et al. (2022); L'Écuyer & Raymond (2023)). It also has a positive relationship with organizational responsiveness Zhou et al. *(*2022), which improves organizational efficiency and effectiveness. Organizational Agility between E-HRM and Labour Productivity will make it easier to deal with threats and changes in the organization and will benefit from the changes (Thathsara & Sutha, 2021).

Based on the research results on the relationship between the variables above, this study examines the relationship between the role of Labor Productivity in the influence of E-HRM on Sustainability Performance and Organizational Agility as a moderating variable in MSMEs in Batam City.

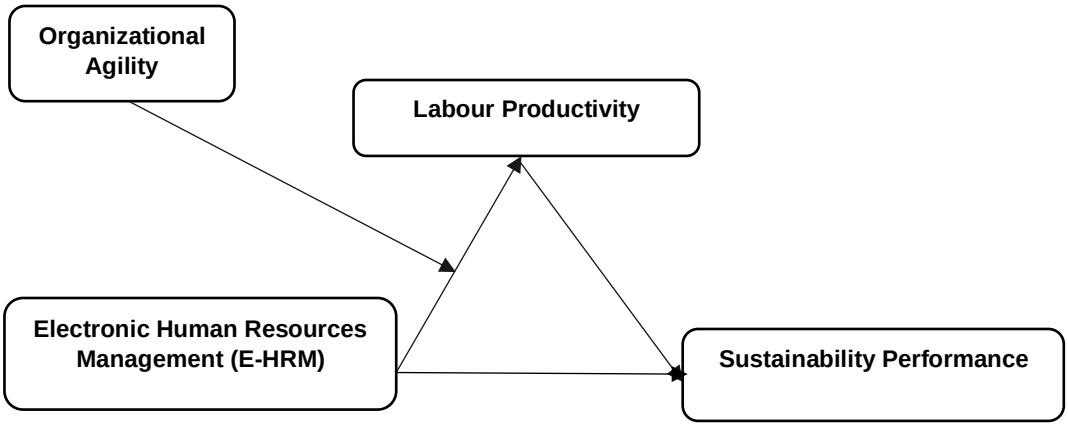

Figure 1. Research Model
Sources: AlNawafleh et al. (2022)

Based on the research model above, the following research hypothesis is formed:

H1: E-HRM significantly positively affects the Sustainability Performance of MSMEs in Batam City.
H2: E-HRM significantly positively affects the Labor Productivity of MSMEs in Batam City.
H3: Labor Productivity significantly positively affects the Sustainability Performance of MSMEs in Batam City.
H4: E-HRM has a significant positive effect on Sustainability Performance through the mediating influence of Labour Productivity of MSMEs in Batam City.

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H5: E-HRM significantly positively affects labor productivity through the moderating influence of organizational agility on MSMEs in Batam City.

METHODS

This study uses quantitative research methods. According to Sahir (2022), quantitative research methods can be defined as a data analysis process using statistical methods to produce numbers obtained through data collection from various questions arranged systematically and used to investigate phenomena systematically by collecting data that can be measured. Quantitative research involves extensive use of numerical data, from data collection to interpretation (Ali et al., 2022). The sample in this study was taken using a non-probability method, namely purposive sampling. Purposive sampling, according to Sahir (2022) in their research, is a form of sampling technique based on specific criteria that must be met. The samples of this study were owners and managers of MSMEs in Batam City. The reason for choosing this sample is because the owner and manager play a direct role in managing the business and employees as human resources in it.

Since the population of MSMEs in 2023-2024 has yet to be discovered, this research will use the sampling method (Hair et al., 2019). This study has 20 indicators, so it requires at least 200 respondents by multiplying the number of indicators by 10. The primary data collected in this study is from primary sources. Researchers collected the necessary data by distributing questionnaires in a G-form containing statements from interconnected variables: Sustainability Performance, E-HRM, Labor Productivity, and Organizational Agility.

This study employs the Partial Least Squares-Structural Equation Modeling (PLS-SEM) analysis technique. This analysis consists of testing the outer model, which will test the validity, reliability, and discriminant validity. After testing the outer model test, an inner model test will be carried out to determine the correlation between the variables formulated in the hypothesis. Data analysis in this study used SmartPLS software. SmartPLS software is used because there are mediator and moderator variables in this study (Muhson, 2022).

RESULTS AND DISCUSSION

Based on the results of distributing questionnaires, the total number of respondents who participated in this study was 200, consisting of 101 male and 99 female respondents. Thus, the data obtained reflects a balanced representation of both genders. Most respondents, as many as 50.5% of the total, have an age range between 23 to 27 years. In terms of education, 68.5% of respondents are Bachelor graduates. 182 respondents, or about 91%, are MSME owners or entrepreneurs. The dominant business fields represented in this study include Food and Beverage, Fashion, Photography, Beauty, Creativity, Online Shopping, and Personal Shopping. Most respondents, especially those in business for 4 to 6 years, show a relatively stable income level and business sustainability.

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Table 1. CMB/CMV Test Result

Indicator	VIF
E-HRM_1	1.445
E-HRM_2	1.317
E-HRM_3	1.496
LP_2	1.547
LP_3	1.462
LP_4	1.549
OA_1	1.793
OA_2	1.621
OA_3	2.188
OA_4	1.674
OA_5	1.697
SP_1	1.681
SP_4	1.545
SP_5	1.351

Source: Data by author (2024)

Conducting the Common Method Bias (CMB) or Common Method Variance (CMV) test aims to determine whether the data is unbiased and error-free. Only data free from CMB/CMV can proceed to further analysis. According to Hair et al. (2019), data is considered free from CMB/CMV if the Variance Inflation Factor (VIF) value is less than 5.00 and if the % of Variance is less than 50%. Based on the test results above, it can be concluded that the data is accessible from Common Method Bias (CMB) or Common Method Variance (CMV) because the value of the Variance Inflation Factor (VIF) shows a value of less than 5.00. Therefore, the analysis of SmartPLS calculation results can continue and run as it should.

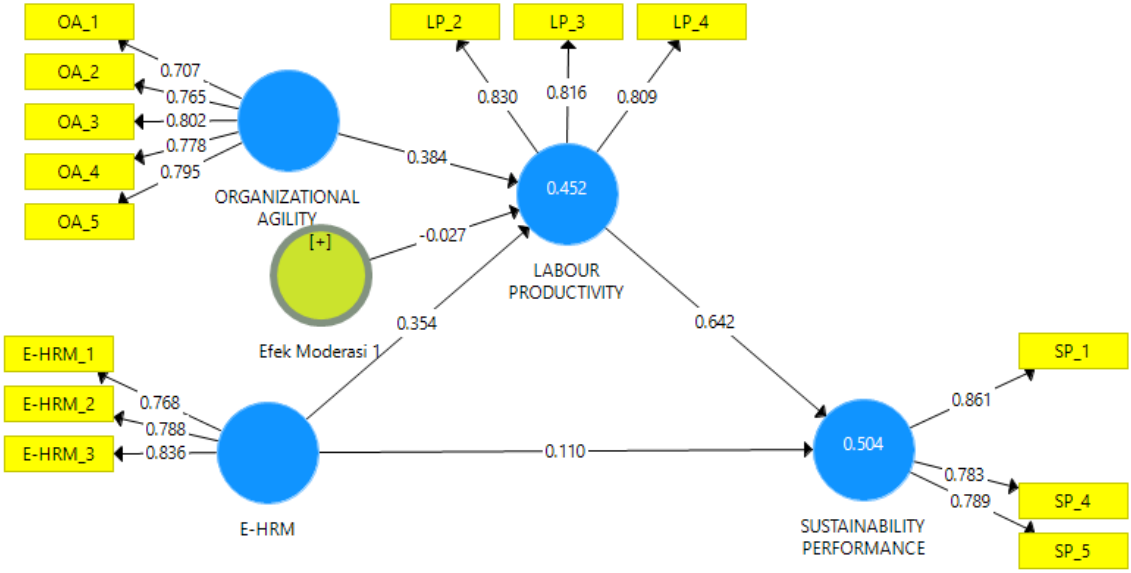

Figure 2. Smart PLS Model
Source: Data By Author (2024)

Based on Hair et al. (2019), the outer loading value can be valid if the indicator reaches a value of more than 0.7. Based on the SmartPLS Model test results above, six indicators do not get a value of 0.7, so these indicators must be discarded and not

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included in further analysis, namely the E-HRM_4, E-HRM_5, LP_1, LP_5, SP_2, and SP_3 indicators. Recalculation was carried out after deleting invalid indicators. After that, the results showed that all remaining indicators had valid results or could have met the convergent validity criteria, so subsequent data testing and analysis could be carried out.

Table 2. Validity Test Result

Variable	AVE	Conclusion
Electronic Human Resouce Management	0.636	Valid
Labour Productivity	0.670	Valid
Organizational Agility	0.593	Valid
Sustainability Performance	0.659	Valid

Source: Data by author (2024)

Based on Ghozali (2021), calculating the Average Variance Extracted (AVE) can determine the value of convergent validity. The criteria for convergent validity AVE can be said to be valid or fulfilled if the value reaches 0.5 or more than 0.5. The results of these data calculations show that all indicators studied have an AVE value of more than 0.5, thus meeting the requirements for the concurrent validity test. This indicates that the variables used in the study have a relatively strong and consistent relationship with the measured construct.

Table 3. Reliability Test Result

Variable	Cronbach's Alpha	Composite Reliability	Conclusion
Electronic Human Resource Management	0.716	0.840	Reliable
Labour Productivity	0.754	0.859	Reliable
Organizational Agility	0.830	0.879	Reliable
Sustainability Performance	0.742	0.853	Reliable

Source: Data by author (2024)

There are two ways to assess a constructed variable's reliability: Cronbach's alpha and composite reliability. Hair et al. (2019) suggested a Rule of Thumb for evaluating these measures, a threshold of 0.6 or higher. If the reliability tests yield results above 0.6, it indicates that testing each construct is reliable. Based on the reliability test outcomes, all constructs assessed using Cronbach's alpha and composite reliability methods exhibit values exceeding 0.6. Therefore, it can be concluded that all constructs are reliable.

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Table 4. Cross Loading Test Result

	E-HRM	LP	OA	SP
E-HRM_1	**0.768**	0.415	0.451	0.265
E-HRM_2	**0.788**	0.471	0.353	0.399
E-HRM_3	**0.836**	0.465	0.308	0.446
LP_2	0.584	**0.830**	0.472	0.548
LP_3	0.414	**0.816**	0.495	0.634
LP_4	0.386	**0.809**	0.447	0.544
OA_1	0.345	0.299	**0.707**	0.290
OA_2	0.386	0.471	**0.765**	0.429
OA_3	0.329	0.408	**0.802**	0.360
OA_4	0.368	0.470	**0.778**	0.378
OA_5	0.329	0.518	**0.795**	0.435
SP_1	0.428	0.626	0.456	**0.861**
SP_4	0.245	0.494	0.314	**0.783**
SP_5	0.454	0.581	0.431	**0.789**

Source: Data by author (2024)

Cross-loading analysis is conducted to examine the correlation of each indicator, which is one of the three criteria for assessing discriminant validity. According to (Ghozali, 2021), the requirement for cross-loadings is that indicators exhibit a minimum correlation of 0.7 with their respective variables. Based on the test results, it is evident that each indicator correlates with its respective variable at a value exceeding 0.7.

Another approach to testing discriminant validity is to compare the square root of the Average Variance Extracted (AVE) for each construct with the correlations between constructs in the model. According to (Fornell & Larcker, 1981), if the square root of the AVE for a construct exceeds its correlations with other constructs, the model demonstrates strong discriminant validity.

Table 5. Fornell Larcker Test Result

	E-HRM	LP	OA	SP
E-HRM	**0.798**			
LP	0.567	**0.819**		
OA	0.455	0.576	**0.770**	
SP	0.473	0.704	0.500	**0.812**

Source: Data by author (2024)

Based on the results of the Fornell Larcker test above, the model shows good discriminant validity. This is because the test results have shown that all variables have met the theoretical criteria (Fornell & Larcker, 1981). From the test results above, it has been explained that the value of each construct is more significant than its respective variables.

Direct Effect Hypothesis Test Results -> path coefficients

The following results directly describe whether or not there is an influence between the variables studied. The value that shows whether or not there is an influence between variables is directly obtained by doing a bootstrapping calculation. The effect between variables is significant if it meets the Rule of Thumb of the T-statistic with a value of more than 1.96 and a P-value with a value of less than 0.05 (Hair et al., 2019). In addition, the direction and magnitude of the influence between variables can be seen by looking at the sample mean value (M). The following is a table of the results of the direct effect test.

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Table 6. Direct Hypothesis Test Result

	Sample Average (M)	T Statistics (O/STDEV)	P Values	Conclusion
E-HRM -> Sustainability Performance	0.114	1.760	0.079	No Significant Positive
E-HRM -> Labour Productivity	0.340	4.094	0.000	Significant Positive
Labour Productivity -> Sustainability Performance	0.644	11.515	0.000	Significant Positive

Source: Data by author (2024)

Hypothesis 1, E-HRM significantly positively affects the Sustainability Performance of MSMEs in Batam City.

The findings from Bootstrapping analysis to examine the hypothesis indicate that the relationship between the E-HRM variable and Sustainability Performance has a statistically insignificant positive impact. The computed T-statistics is 1.760 with a corresponding P-value of 0.079, failing to satisfy the threshold for the direct effect hypothesis test (Path Coefficients). E-HRM does not show its role in improving Sustainability Performance in the effectiveness and efficiency of MSMEs because it does not contribute to profits, operational cost savings, or human resource services, and there is no method for owners and managers to interpret, manage, or update information needed to manage the organization's human resources. With the following, it can be said that the hypothesis findings are not accepted (rejected). The findings of this study contradict research from Talukdar & Ganguly (2022), Waheed et al. (2020), and the findings of Rahman & Hosain (2021), which revealed that E-HRM has a significant influence on the Sustainability Performance of MSMEs.

Hypothesis 2, E-HRM significantly positively affects the Labor Productivity of MSMEs in Batam City.

The results of the Bootstrapping analysis conducted to evaluate the hypothesis demonstrate a significant and positive relationship between E-HRM variables and Labor Productivity. The computed T-statistics is 4.094 with a corresponding P-value of 0.000, meeting the criteria for the direct effect hypothesis test (Path Coefficients). According to this study, implementing E-HRM significantly enhances the Labor Productivity of MSMEs in Batam City, as evidenced by the significant relationship observed in the variable test. These findings are corroborated by research conducted by Iqbal et al. (2019) and Nurshabrina & Adrianti (2020), highlighting that one of the primary motivations for adopting E-HRM is to enhance Labor Productivity. Other studies have also demonstrated that E-HRM practices contribute to improvements in Labor Productivity. Additionally, further support for these findings comes from studies such as Muqaddim & Hosain (2021) and Wijayadne (2021), which indicate a significant and positive impact of E-HRM practices on managers' perceptions of Labor Productivity.

Hypothesis 3, Labor Productivity significantly positively affects the Sustainability Performance of MSMEs in Batam City.

The outcomes of the Bootstrapping analysis conducted to assess the hypothesis demonstrate a significant and positive relationship between the Labor Productivity variable and Sustainability Performance. The computed T-statistics is 11.515 with a corresponding P-value of 0.000, meeting the criteria for the direct effect hypothesis test (Path Coefficients). According to this study, an increase in Labor Productivity among MSMEs is associated with improved Sustainability Performance. These findings are

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consistent with the research by Barrymore & Sampson (2021), which suggests that enhancing Labor Productivity can positively impact organizational Sustainability Performance. Additionally, research results from Souza et al. (2021) support these findings by highlighting the role of sustainability in creating a competitive advantage and fostering a work environment that promotes non-discrimination and environmental care.

Indirect Effect

The indirect effect represents the outcome of a bootstrapping analysis highlighting the influence of mediation and moderation variables within the research model. An indirect effect between variables is deemed significant if it aligns with the Rule of Thumb criteria, with a T-statistic value exceeding 1.96 and a corresponding P-value below 0.05 (Hair et al., 2019). Additionally, to assess the direction and strength of the indirect relationship between variables, one can examine the sample mean value (M). Below is a table presenting the results of the indirect effect testing.

Table 7. Indirect Hypothesis Test Result

	Sample Average (M)	T Statistics (|O/STDEV|)	P Values	Conclusion
E-HRM -> Labour Productivity -> Sustainability Performance	0.219	3.775	0.000	Significant Positive
Moderating Effect 1 -> Labour Productivity	-0.032	0.671	0.502	No Significant Negative

Source: Data by author (2024)

Hypothesis 4, E-HRM has a significant positive effect on Sustainability Performance through the mediating influence of Labour Productivity of MSMEs in Batam City.

The results of the Bootstrapping analysis to examine the hypothesis demonstrate that the relationship between E-HRM variables and Sustainability Performance, mediated by Labor Productivity, exhibits a significant and positive impact. The computed T-statistics is 3.775 with a corresponding P-values of 0.000, meeting the Rule of Thumb criteria for the indirect effect hypothesis test. This indicates that Labor Productivity acts as a mediator in the relationship between E-HRM and Sustainability Performance. According to these findings, implementing E-HRM can influence Labor Productivity in MSMEs. The enhancement in Labor Productivity resulting from adopting E-HRM subsequently contributes to improved Sustainability Performance of MSMEs. Therefore, in this study, E-HRM is shown to indirectly influence Sustainability Performance through Labor Productivity as an intermediary variable. This theoretical conclusion is supported by research conducted by Al-Shammari et al. (2022), Khan et al. (2021), and (Nawangsari & Sutawidjaya, 2021).

Hypothesis 5, E-HRM significantly positively affects labor productivity through the moderating influence of organizational agility on MSMEs in Batam City.

The results of the Bootstrapping calculation to analyze the hypothesis show that the relationship between E-HRM variables and Labour Productivity moderated by Organizational Agility has an insignificant negative effect. The computed T-statistics is 0.671 with a corresponding P-value of 0.502, so it does not meet the Rule of Thumb of the indirect effect hypothesis test. Organizational Agility does not moderate the relationship between E-HRM and Labour Productivity. Implementing E-HRM in MSMEs affects Labour Productivity directly without the moderating influence of Organizational Agility. With the following, it can be said that the hypothesis findings are not accepted

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(rejected). The findings of this hypothesis are supported by the research findings of Barahma et al. (2021), and Amoako et al. (2022), which revealed that other factors, besides Organizational Agility, play a more dominant role in the relationship between E-HRM and Labour Productivity in MSMEs. For example, employee commitment and involvement in adopting new technology, management support for E-HRM implementation, organizational leadership, organizational structure, and employee technological capability.

Table 8. R Square Test Result

Variable	Sample Mean (M)
Labour Productivity	0.464
Sustainability Performance	0.514

Source: Data by author (2024)

Based on the criteria established by Hair et al. (2019), the R square test results indicate different model strengths. An R square value of 0.75, 0.50, and 0.25 signifies strong, moderate, and weak models. The R square value for the endogenous variable Labor Productivity is 0.464, indicating that E-HRM and Organizational Agility can account for 46.4% of the variance in Labor Productivity. In comparison, the remaining 53.6% is attributed to other unaccounted variables. As per Hair et al. (2019) criteria, an R square value below 0.50 categorizes the predictive ability as "moderate." Similarly, the R square value for the Sustainability Performance variable is 0.514, suggesting that E-HRM and Labor Productivity collectively explain 51.4% of the variance in Sustainability Performance, with 48.6% being influenced by other unobserved factors. According to the criteria outlined by Hair et al. (2019), an R square value exceeding 0.50 characterizes the predictive strength as "strong."

Table 9. Standardized Root Mean Square Residual (SRMR) Test Result

	Sample Mean (M)
Saturated Model	0.058
Estimated Model	0.063

Source: Data by author (2024)

The Standardized Root Mean Square Residual (SRMR) represents the discrepancy between the model's observed correlation and the implied correlation matrix. Therefore, the SRMR value serves as an indicator of how well the correlation matrix fits the model. According to Hu & Bentler (1999) guidelines, an SRMR value below 0.1 suggests that the model adequately fits the data. The results indicate that the SRMR value aligns with this guideline, confirming a good fit of the model to the data.

Latan & Ghozali (2012) revealed that GoF has three assessment categories, namely, a value ≥ 0.10 is categorized as weak GoF, a value ≥ 0.25 is categorized as moderate GoF, and ≥ 0.36 is categorized as strong GoF. The greater the GOF value, the better the resulting model.

Table 10. Goodness of Fit (GoF) Test Result

Variable	Result	Conclusion
GoF	0.5592	Strong

Source: Data by author (2024)

Based on the results of GoF calculations and assessment categories, the research model falls into the "strong" category.

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CONCLUSION

Based on the research conclusions above, the research hypothesis that shows a direct and significant positive effect on Sustainability Performance is Labor Productivity. Meanwhile, E-HRM implementation has an insignificant positive impact on sustainability performance and a positive and significant impact on labor productivity. The proven indirect research hypothesis is the relationship between E-HRM implementation and Sustainability Performance mediated by Labor Productivity. However, the hypothesis that E-HRM implementation significantly positively affects Labour Productivity through moderation of organizational agility has yet to be proven. For future research, expanding the research framework by introducing additional independent variables and expanding the scope of the population and research sample is recommended. This will help obtain more diverse and complex research results, which can be a valuable reference for future research.

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