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Article

Environmental Management System and Pro-Environmental Behavior in Realizing Sustainable Industry Performance: Mediating Role of Green Marketing Management

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Abstract: Growth in the number of tourist destinations encourages the number of tourists and other fields that support it. The hotel industry that is increasing in number in an area will impact the environment, both the natural, social and economic environment. We analyze the influence of Green Marketing Management as a mediator of the Environmental Management System and Pro-Environmental Behavior to achieve Sustainable Industry Performance in the hospitality industry. This study was conducted with 135 respondents with the position of manager or general manager. There are 17 hypotheses built on indicators of 4 main parameters. The analysis uses Smart-PLS to examine the relationship between the dimensions tested. The results of this study are: (1) Environmental Management System and Pro-Environmental Behavior have a significant and positive influence on the Green Marketing Mix; (2) Only the Green Marketing Mix has a significant and positive influence on Economic Sustainability; (3) Only the Green Marketing Mix has a significant and positive influence on Environmental Sustainability; (4) The Environmental Management System and Green Marketing Mix have a significant and positive influence on Social Sustainability, with the strongest influence being given by the Green Marketing Mix (which has the greatest path coefficient); (5) The effect of Pro-Environmental Behavior on Sustainability is entirely dependent on mediation relationships through the Green Marketing Mix.

Keywords: Green marketing management; environmental management system; pro-environmental behavior; sustainable industry performance.

1. Introduction

The world's developments in tourism have increased rapidly in recent years (before the Covid-19 outbreak). Some countries and regions compete to create tourist destinations and attractions to invite tourists to come (Al-Gasawneh et al., 2021). Growth in the number of tourist destinations encourages the number of tourists and other fields that support it. The hotel industry that is increasing in number in an area will impact the environment, both the natural, social and economic environment (Siregar et al., 2021). The increased number of hotels in tourist destination areas is a blessing from one side, such as the economy and employment.

But on the other hand, the growing number of hotels can influence the environment and society. This research was carried out in Malang, East Java Province, Indonesia. Malang Raya combines three cities: Malang City, Batu City, and Malang Regency. Malang Raya is one area that is very rapidly developing in tourism. Due to its location, which has a variety of tourist destinations, ranging from the highlands, and lowlands to the beach. Most tourists come from domestic, with a very large number—Businesspeople capture opportunities for tourists by setting up hotels. Growth in the number of hotels in Malang is relatively very high compared to other cities in Indonesia.

The high growth in the number of hotels is a good alternative for the economy of Malang Raya. But on the other hand, environmental and social impacts are likely related to the rise of Malang Raya into a tourist destination. This research was conducted to see whether there is a relationship between the Environmental Management System (EMS) and the Pro-Environmental Behavior (PEB) to the Sustainable Industry Performance (SIP), especially in the hospitality industry. This study also uses 7P's Green Marketing Mix (GMM) as a mediator between EMS and PEB with SIP. Environmental management has a relationship with a competitive advantage and business performance. The environmental management system is more developed for higher class hotels. That is because it is affiliated with the supply chain in hotels (Pereira-Moliner et al., 2015).

Research on the relationship between the implementation of an environmental management system and sustainable performance in an organization was conducted by (Martín-de Castro et al., 2016). Several studies have also been conducted on the relationship between pro-environmental behavior and sustainable performance in organizations or industries (e.g., Farooq et al., 2021, 2022; Foster et al., 2022; Hunt & Harbor, 2019; Kim et al., 2019; Mat et al., 2020; Miller et al., 2015; Ro et al., 2017; Yusliza et al., 2020). They found that the behavior of organizational members who support the green movement affects the results of organizational and environmental performance. The Green movement aims to make the world more environmentally friendly. Savings in using electricity, water, paper, etc., have been proven to positively impact financial performance, relations with the environment, and society. The relationship between Marketing Mix and sustainable organizational performance was investigated by (e.g., Hsiao et al., 2014; Kim et al., 2019; Lam & Li, 2019; Pomering, 2017). Their study found that the relationship between the use of a marketing mix in an organization would positively contribute to the organisation's sustainable performance.

2. Materials and Methods

The amount of data in this study is 135 data, obtained from respondents in the form of hotel employees with the position of General Manager or Manager. Retrieval of data using questionnaires, both paper questionnaires and Google Form. The reason for using the Google Form questionnaire is because, at the time of this research, the Covid-19 pandemic was taking place. The analysis used to process statistical data from respondents is PLS-SEM (Partial Least Squares Structural Equation Modeling). PLS is a soft modeling method for SEM without assumptions about data distribution (Hair et al., 2019). PLS analysis is used to determine the suitability of a theoretically defined construct (Chin et al., 2003). PLS is used for structural equation modeling in applied research (Wong, 2013).

3. Results

3.1. Measurement model

Following the criteria regarding the value of SFL, AVE and CR, then: SFL is Standardized Factor Loading (good criteria: SFL $\geq$ 0.70); AVE is Average Variance Extracted (good criteria: AVE $\geq$ 0.50), and CR is Composite Reliability (good criteria: CR $\geq$ 0.70). The results of the analysis using PLS techniques as seen in Table 1.

Table 1. Results of construct validity and reliability for Environmental Management System

Variable(s) / Dimension(s)	Standardized Factor Loading	t-value	AVE	CR
Environmental Management System (EMS)				
Environmental Policy	0.81	26.17	0.63	0.90
Planning	0.83	21.98		
Implementation and Operation	0.87	44.64		
Checking and Corrective Actions	0.63	10.49		
Management Review	0.82	26.91		
Environmental Policy				
EMS 1.1	0.87	40.73	0.71	0.91
EMS 1.2	0.89	54.24		
EMS 1.3	0.80	22.33		
EMS 1.4	0.80	23.84		
Planning				
EMS 2.1	0.78	22.53	0.65	0.88
EMS 2.2	0.84	27.27		
EMS 2.3	0.81	20.15		
EMS 2.4	0.78	20.61		
Implementation and Operation				
EMS 3.1	0.85	38.09	0.73	0.91
EMS 3.2	0.91	53.66		
EMS 3.3	0.90	51.13		
EMS 3.4	0.75	16.46		
Checking and Corrective Actions				
EMS 4.1	0.96	111.02	0.93	0.96
EMS 4.2	0.96	72.39		
Management Review				
EMS 5.1	0.76	19.94	0.70	0.90
EMS 5.2	0.84	25.12		
EMS 5.3	0.86	23.30		
EMS 5.4	0.86	42.65		

Table 1 shows the construct validity and reliability of the environmental management system. This study found that the value of standardized factor loadings (SFL) is higher than 0.70, and the highest value of SFL is 0.96. Then, the t-value indicates that the item's validity is fulfilled. The average variance extracted (AVE) is used to measure convergence validity. The results of AVE showed that all the variables/ dimensions are higher than 0.50. The highest value of AVE is 0.96. Composite reliability (CR) measures the internal consistency of the measurement scale. The results of CR displayed higher than 0.70. It means that the measurement scales are reliable.

Table 2. Results of construct validity and reliability for green marketing mix

Variable(s) / Dimension(s)	Standardized Factor Loadings	t-value	AVE	CR
Green Marketing Mix (GMM)				
Green Product	0.74	20.67	0.58	0.91
Green Place	0.77	18.46		
Green Price	0.85	38.25		
Green Promotion	0.77	18.36		
Green Process	0.71	17.58		
Green People	0.62	11.21		

Green Physical Evidence	0.86	31.11		
Green Product				
GMM 1.1	0.81	21.44	0.63	0.87
GMM 1.2	0.87	36.46		
GMM 1.3	0.82	25.27		
GMM 1.4	0.67	11.24		
Green Place				
GMM 2.1	0.85	31.67	0.75	0.92
GMM 2.2	0.85	33.00		
GMM 2.3	0.88	42.36		
GMM 2.4	0.87	42.08		
Green Price				
GMM 3.1	0.82	19.45	0.74	0.92
GMM 3.2	0.88	33.73		
GMM 3.3	0.92	68.76		
GMM 3.4	0.82	31.15		
Green Promotion				
GMM 4.1	0.88	50.93	0.72	0.91
GMM 4.2	0.87	41.11		
GMM 4.3	0.84	25.37		
GMM 4.4	0.81	20.33		
Green Process				
GMM 5.1	0.83	29.40	0.54	0.82
GMM 5.2	0.63	8.79		
GMM 5.3	0.71	11.94		
GMM 5.4	0.75	15.82		
Green People				
GMM 6.1	0.78	17.51	0.77	0.93
GMM 6.2	0.93	73.67		
GMM 6.3	0.91	49.78		
GMM 6.4	0.89	47.65		
Green Physical Evidence				
GMM 7.1	0.88	46.99	0.71	0.91
GMM 7.2	0.90	61.15		
GMM 7.3	0.81	21.28		
GMM 7.4	0.76	16.95		

Table 2 shows the construct validity and reliability of the green marketing mix. This study found that the value of standardized factor loadings (SFL) is higher than 0.70, and the highest value of SFL is 0.92. Then, the t-value indicates that the item's validity is fulfilled (> 1.96). The average variance extracted (AVE) is used to measure convergence validity. The results of AVE showed that all the variables/ dimensions are higher than 0.50. The highest value of AVE is 0.77. Composite reliability (CR) measures the internal consistency of the measurement scale. The results of CR displayed higher than 0.70. It means that the measurement scales are reliable.

Table 3. Results of construct validity and reliability for pro-environmental behavior

Variable(s) / Dimension(s)	**Standardized Factor Loadings**	**t-value**	**AVE**	**CR**
Pro-Environmental Behavior (PEB)				
Energy Saving	0.85	28.13	0.74	0.90
Prevention of Waste	0.85	41.39		

Preserve Nature	0.88	40.42		
Energy Saving				
PEB 1.1	0.91	52.33	0.82	0.93
PEB 1.2	0.94	67.38		
PEB 1.3	0.86	38.80		
Prevention of Waste				
PEB 2.1	0.86	54.11	0.66	0.85
PEB 2.2	0.87	29.46		
PEB 2.3	0.69	8.91		
Preserve Nature				
PEB 3.1	0.74	16.80	0.70	0.90
PEB 3.2	0.83	23.92		
PEB 3.3	0.88	41.48		
PEB 3.4	0.89	55.33		

Table 3 shows the result of construct validity and reliability for pro-environmental behavior. This study found that the value of standardized factor loadings (SFL) is higher than 0.70, and the highest value of SFL is 0.94. Then, the t-value indicates that the item's validity is fulfilled. The average variance extracted (AVE) is used to measure convergence validity. The results of AVE showed that all the variables/ dimensions are higher than 0.50. The highest value of AVE is 0.82. Composite reliability (CR) measures the internal consistency of the measurement scale. The results of CR displayed higher than 0.70. It means that the measurement scales are reliable.

Table 4. Results of construct validity and reliability for sustainability industry performance

Variable(s) / Dimension(s)	**Standardized Factor Loadings**	**t-value**	**AVE**	**CR**
Sustainability Industry Performance (Economy)				
SIP 1.1	0.74	15.10	0.51	0.81
SIP 1.2	0.70	12.15		
SIP 1.3	0.74	11.31		
SIP 1.4	0.68	7.90		
Sustainability Industry Performance (Environment)				
SIP 2.1	0.87	44.24	0.75	0.95
SIP 2.2	0.86	37.06		
SIP 2.3	0.90	55.16		
SIP 2.4	0.89	49.80		
SIP 2.5	0.88	51.22		
SIP 2.6	0.81	27.25		
Sustainability Industry Performance (Social)				
SIP 3.1	0.72	13.71	0.68	0.91
SIP 3.2	0.81	28.31		
SIP 3.3	0.89	60.36		
SIP 3.4	0.87	39.36		
SIP 3.5	0.81	28.04		

Table 4 shows the result of construct validity and reliability for sustainability industry performance. This study found that the value of standardized factor loadings (SFL) is higher than 0.70, and the highest value of SFL is 0.90. Then, the t-value indicates that the item's validity is fulfilled. The average variance extracted (AVE) is used to measure convergence validity. The results of AVE showed that all the variables/ dimensions are higher than 0.50. The highest value of AVE is 0.75. Composite reliability (CR) measures the internal consistency of the measurement scale. The results of CR displayed higher than 0.70. It means that the measurement scales are reliable.

Table 5. Results of discriminant validity using Fornell-Lacker criteria

No.	Variable(s)	1	2	3	4	5	6
1	Environmental Management System	0.79					
2	Green Marketing Management	0.73	0.76				
3	Pro-Environmental Behavior	0.73	0.73	0.86			
4	Sustainable Industry Performance (Economy)	0.56	0.61	0.58	0.71		
5	Sustainable Industry Performance (Environment)	0.40	0.61	0.46	0.53	0.87	
6	Sustainable Industry Performance (Social)	0.69	0.76	0.62	0.61	0.65	0.82

Table 5 displays the results of the discriminant validity test using the Fornell-Lacker criteria. This study found that all dimensions meet the discriminant validity requirements. It can be seen that all of the correlation values between the two constructs are less than the square root of the AVE value.

3.2. Structural model

After assessing the measurement model, this study employs the structural model assessment. It consists of coefficient determination, effect size, predictive relevance and hypothesis testing.

Table 6. The result of the coefficient determination (R Square) and predictive relevance (Q Square)

Latent Endogen	R^2	Q^2	Conclusion R^2	Conclusion Q^2
Environmental Management System	0.61	0.24	Moderate	Good Prediction
SIP (Economy)	0.42	0.19	Moderate	Good Prediction
SIP (Environmental)	0.38	0.28	Moderate	Good Prediction
SIP (Social)	0.62	0.42	Moderate	Good Prediction

Table 6 captures the result of the coefficient determination (R Square) and predictive relevance (Q Square). Test of coefficient of determination and predictive relevance shows that all dimensions have good predictive power (Q^2 higher than 0). At least three of the four dimensions also have a minimum, moderate determinant coefficient. It indicates that the indicators for the dimensions of Green Marketing Management, Sustainable Industry Performance (SIP) (Economy), SIP (Environmental), and SIP (Social) have been able to explain each dimension well.

Table 7. The result of effect size (f square) and impact of predictive relevance (q square) for green marketing management

Exogenous Latent	f^2	q^2	Conclusion f^2	Conclusion q^2
Environmental Management System	0.21	0.04	Moderate Effect	Small effect
Pro-Environmental Behavior	0.21	0.04	Moderate Effect	Small effect

Table 7 shows the effect size (f square) and impact of predictive relevance (q square) for green marketing management. This study found that the environmental management system and pro-environmental behavior effect size are moderate, and the impact of predictive relevance is small.

Table 8. The result of effect size (f square) and impact of predictive relevance (q square) for sustainability industry performance (Economy)

Exogenous Latent	f^2	q^2	Conclusion f^2	Conclusion q^2
Environmental Management System	0.00	0.00	Very Small Effect	Very Small Effect
Green Marketing Management	0.09	0.02	Small effect	Small effect
Pro-Environmental Behavior	0.02	0.00	Small effect	Very Small Effect

Table 8 displays the result of effect size (f square) and impact of predictive relevance (q square) for sustainability industry performance (Economy). This study found that environmental management system, green marketing management and pro-environmental behavior effect size and impact of predictive relevance are categorized as very small to small effects.

Table 9. The result of effect size (f square) and impact of predictive relevance (q square) for sustainability industry performance (Environment)

Exogenous Latent	**f^2**	**q^2**	**Conclusion f^2**	**Conclusion q^2**
Environmental Management System	0.02	0.01	Small effect	Very Small Effect
Green Marketing Management	0.24	0.17	Moderate Effect	Moderate Effect
Pro-Environmental Behavior	0.02	0.01	Small effect	Very Small Effect

Table 9 shows the result of effect size (f square) and impact of predictive relevance (q square) for sustainability industry performance (Environment). This study found that environmental management system, green marketing management and pro-environmental behavior effect size and impact of predictive relevance are categorized as very small, small and moderate effects.

Table 10. The result of effect size (f square) and impact of predictive relevance (q square) for sustainability industry performance (Social)

Exogenous Latent	**f^2**	**q^2**	**Conclusion f^2**	**Conclusion q^2**
Environmental Management System	0.11	0.05	Small effect	Small effect
Green Marketing Management	0.29	0.14	Moderate Effect	Moderate Effect
Pro-Environmental Behavior	0.03	0.00	Small effect	Very Small Effect

Table 10 shows the result of effect size (f square) and impact of predictive relevance (q square) for sustainability industry performance (Social). This study found that environmental management system, green marketing management and pro-environmental behavior effect size and impact of predictive relevance are categorized as very small, small and moderate effects.

Table 11. The result of hypothesis testing

Pathway	**Coefficient**	**t-value**
Environmental Management System → Green Marketing Management	0.42	4.52***
Environmental Management System → Sustainable Industry Performance (Economy)	0.15	1.25
Environmental Management System → Sustainable Industry Performance (Environmental)	-0.13	1.35
Environmental Management System → Sustainable Industry Performance (Social)	0.29	3.46***
Pro-Environmental Behavior → Green Marketing Management	0.42	4.97***
Pro-Environmental Behavior → Sustainable Industry Performance (Economy)	0.23	1.55
Pro-Environmental Behavior → Sustainable Industry Performance (Environmental)	0.09	0.75
Pro-Environmental Behavior → Sustainable Industry Performance (Social)	0.02	0.24
Green Marketing Management → Sustainable Industry Performance (Economy)	0.34	2.74***
Green Marketing Management → Sustainable Industry Performance (Envi-	0.64	6.33***

ronmental)		
Green Marketing Management → Sustainable Industry Performance (Social)	0.53	6.29***

Table 11 displays the result of hypothesis testing (Appendix A). This study found that environmental management systems and pro-environmental behavior have a significant and positive influence on the green marketing mix. Only the Green Marketing Mix has a significant and positive influence on Economic Sustainability. The green marketing mix has a significant and positive influence on environmental sustainability. The environmental management system and green marketing mix have a significant and positive influence on social sustainability. The green marketing mix has the strongest influence (the greatest path coefficient).

Table 12. The result of mediating effect testing

Relationship	**Coefficient**		**VAF**	**Conclusion**
	Direct	**Indirect**		
EMS → SIP (Economy)	0.15	0.14	48%	Partial mediation
EMS → SIP (Social)	0.29	0.22	43%	Partial mediation
PEB → SIP (Economy)	0.23	0.14	38%	Full mediation
PEB → SIP (Environmental)	0.09	0.27	75%	Full mediation
PEB → SIP (Social)	0.02	0.22	92%	Full mediation

Note: EMS is environmental management system; PEB is pro-environmental behavior; SIP is sustainable industry performance.

Table 12 shows the mediating results and indicates that some mediation relationships are partial relationships and others have full relationships. The partial mediation relationship is owned by the relationship between EMS → SIP (Economy) and EMS → SIP (Social). This type of relationship indicates that direct relationships partly influence the influence of EMS on SIP (Economy/ Social) and some is influenced by mediation relationships by passing GMM variables. The full mediation relationship is owned by the relationship between PEB → SIP (Economy), PEB → SIP (Environmental), and PEB → SIP (Social). This type of relationship indicates that mediation relationships entirely influence the influence of PEB on SIP through GMM. As for the relationship between PEB → SIP (Economy) and PEB → SIP (Environmental), both are special cases, even though the VAF value below 80% is still classified as full mediation. The direct relationship of PEB to SIP (Economic / Environmental) was initially significant (first requirement testing table). Still, when the GMM variable entered the model, the direct relationship became insignificant so that all direct effects on the SIP were transferred to mediation. The effect of Pro-Environmental Behavior on Sustainability is entirely dependent on mediation relationships through the Green Marketing Mix.

4. Conclusions

In conclusion, this study has successfully identified and examined the determinant factors of sustainable industry performance. Also, this study found mediating green marketing management in the relationship between the environmental management system and pro-environmental behavior toward realizing sustainable industry performance.

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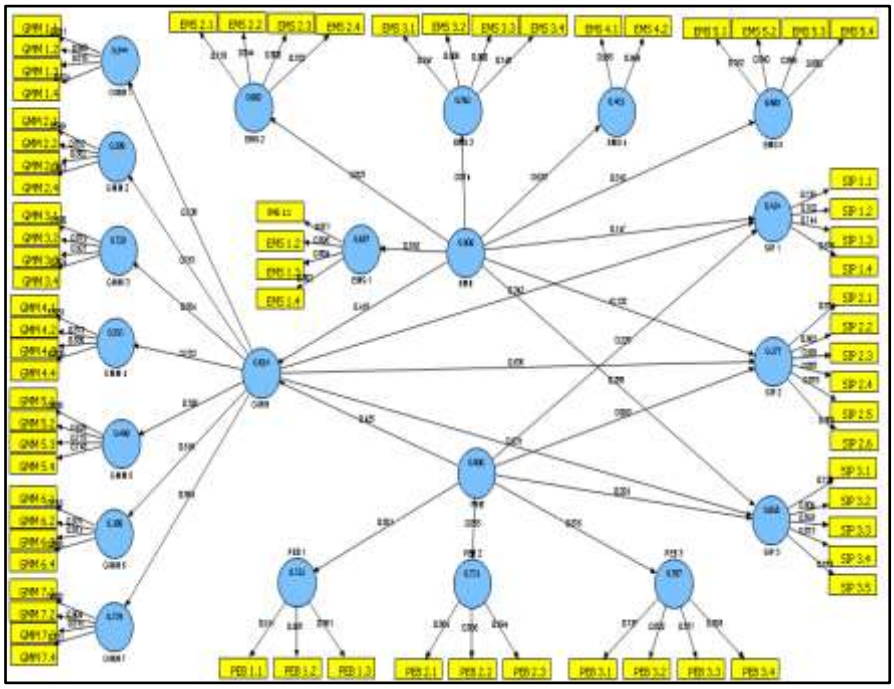
Conflicts of Interest: The authors declare no conflict of interest.

Appendix A: The origial result of PLS algorithm



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