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The Role of Smart Automation in Tourism Industry Management Using Smart PLS

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ABSTRACT

The main objective of this research is to critically examine existing research and the application of smart automation (Smart PLS) in the tourism industry. Ad-ditionally, this study proposes a new evaluation framework to identify vulnera-bilities in the adoption of smart automation. This is a synthesis and evaluation study, where qualitative findings about the implementation of smart automation in the tourism industry are presented. The study uses a seven-dimensional eval-uation framework based on Rogers' diffusion theory (2003) to assess the current implementation of intelligent automation. The vulnerability of adopting smart automation in the tourism industry depends largely on the type of smart automa-tion used. Search/booking engines, virtual agents, and chatbots are three types of intelligent automation that have high vulnerability levels. The limitations and implications of this study are that it bridges the foundations of innovation dif-fusion theory and the application of smart automation. The findings from this research can help researchers, developers, and managers evaluate the vulnera-bility of adopting smart automation technology in the tourism industry. This paper is also one of the few papers that assess the vulnerability of adopting smart automation in the tourism industry, and it develops a theory-based evalu-ation framework to systematically evaluate smart automation innovation in the tourism industry.

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1. INTRODUCTION

Having a comprehensive understanding of smart automation is crucial for the tourism industry. The introduction of Information and Communication Technology (ICT) has the potential to create significant trans-formations in the tourism industry, presenting a variety of opportunities and challenges. ICT enables tourists to easily locate, tailor, and purchase tourism products while also supporting the industry in developing, man-aging, and disseminating tourism services globally. By implementing ICT, stakeholders in the

tourism sector can employ intelligent automation to enhance transactional efficiency and communication [1]. ICT allows for the integration of customer relationship management and supply chain management into a user-friendly plat-form for a wide range of operations, including product selection, booking, fulfillment, tracking, payment, and reporting.

The use of intelligent automation in the tourism industry has grown exponentially, with 20% of trans-portation companies implementing intelligent automation technologies in 2016 and an expected growth rate of 8% (McKinsey Global Institute, 2017). Additionally, about 12% of other travel and tourism businesses, including hotels and entertainment venues, have followed suit with an annual growth rate of 6.5% [2]. While intelligent automation has been primarily used in service operations, there is projected growth in product devel-opment, marketing, and sales (McKinsey Global Institute, 2017). Studies have shown the benefits of intelligent automation in the hospitality and tourism industry, including increased productivity, efficiency, and profitability for suppliers and personalized and convenient experiences for consumers (Kong et al., 2021; Cain et al., 2019; Samara et al., 2020). However, there is still a need for a theoretical framework to evaluate the introduction of intelligent automation in the tourism industry [3].

The tourism industry utilizes two types of artificial intelligence systems, namely purely digital systems and digital-physical hybrid systems commonly referred to as robots. These systems are employed in various aspects of the tourism industry. For instance, the airline industry utilizes automated digital systems such as online check-in and mobile boarding passes. However, the most significant impact on the tourism industry has been the emergence of various chatbot types, which have resulted in significant benefits and major changes to the industry.

2. LITERATURE REVIEW

2.1. Tourism Industry Adaptation

The tourism industry adaptation is equally crucial for Small and Medium Enterprises (SMEs). SMEs are a vital business sector in Indonesia as they contribute significantly to the country's economic growth and employment rate [4]. However, these businesses encounter various challenges, including adapting to the tourism industry. To maintain their existence and remain competitive both locally and globally, SMEs need to improve their adaptation to the tourism industry. This can be achieved by leveraging supportive technologies such as Information and Computer Technology [5]. By doing so, SMEs can enhance their efficiency and effectiveness, resulting in improved performance in achieving their business objectives. Moreover, it's important to consider social and cultural sensitivity and environmental sustainability aspects when adapting the tourism industry in SMEs [6]. This approach will ensure that the resulting tourism industry is sustainable and has a positive impact on the surrounding environment while remaining culturally and socially friendly [7].

2.2. Tourism Industry Idea

The concept of the tourism industry involves producing goods or services that rely on cultural-based human creativity to generate economic benefits and improve society's welfare [8]. Indonesia has immense potential for developing a creative industry based on culture and nature. The creative industry encompasses a wide range of areas, including applications, architecture, interior design, product design, visual communication design, fashion, FAV (film, animation, and video), photography, game development, crafts, culinary, music, publishing, advertising, performing arts, fine arts, television, and radio (Ministry of Tourism and Creative Economy, 2020). The government has implemented several policies to support the growth and development of this industry, which positively impacts the economy and employment rates. Creative industries can also create new job opportunities. Thus, the tourism industry has been identified as a critical component of Indonesia's economy. As natural resources become scarce, industries should pivot towards optimizing the creative potential of human resources, particularly the younger generation. Creative energy can lead

to the development of innovative products and services with high economic value [9]. Therefore, the creative young generation can be a vital component of an industry-oriented future (Herlambang, 2015).

3. METHOD

The research method used in this study is a quantitative approach using the Smart Partial Least Square (PLS) method as a data analysis tool [10],[11]. The quantitative approach was chosen to measure the extent of the influence of smart automation in smart tourism industry management on tourist destination loyalty and sustainable development using numerical data generated from questionnaires [12],[13], as shown in Table 1.

Table 1. Indicators Used To Measure Constructs

Construct	Indicators	Contents
Cultural Wealth (CW)	I appreciate the uniqueness of this heritage tourist destination	CW1
	I admire how this place blends with the captivating landscape/scenery/ensemble/historical city and offers many other attractions.	CW2
	This visit provides a comprehensive insight into the historical era of this cultural heritage.	CW3
	During my visit, I didn't feel connected to the related history, legends, and historical figures.	CW4
Travel Desires (TD)	The likelihood of me returning to this heritage site for another heritage trip is high.	TD1
	If given the opportunity, I would definitely return to places that have heritage tourism.	TD2
	To acquire a deeper understanding of the heritage of the city.	TD3
Social Media Platform Choices (SMPC)	I will share the positive aspects of this heritage tourism on social media.	SMPC1
	I will promote this heritage tourism on my social media platforms.	SMPC2
	I will not provide a positive review on my social media platforms.	SMPC3
Visitor Participation (VP)	I visited a place that I really wanted to visit.	VP1
	I visited a place that I've been wanting to visit so much.	VP2
	When I talk about my visit to the city, I will say positive things.	VP3
	I will engage in various activities to enhance the image of heritage tourism.	VP4

Beauty of the Journey (BOTJ)	I thoroughly enjoyed this tourism experience.	BOTJ1
	I enjoyed the activities, which were something I really wanted to do.	BOTJ2
	I am interested in the main activities of this tourism experience.	BOTJ3
	However, I had a somewhat unpleasant experience in this city.	BOTJ4

4. THE COMPREHENSIVE THEORETICAL BASIS

Additionally, the Smart PLS method was selected because it can address the issues of multicollinearity and relatively small sample size, and it has the ability to test structural models simultaneously [14]. This method can also generate path analysis that can be used to test the direct and indirect effects of the variables involved in this study.

By using multiple indicators and considering the proposed concepts and theories, this research aims to examine the aforementioned objectives and produce outcomes that can be used as guidelines to determine suitable strategic policies for managing the tourism industry. The research methodology employed in this study is quantitative analysis, and the following steps are undertaken to achieve the research objectives:

1. Preliminary survey, The step taken is observing the productivity in the tourism industry.
2. Conducting literature review, To identify theoretically the potential methods that could be applied to tackle issues at hand.
3. Identifying and formulating problems, Carrying out the process of identifying and formulating challenges that arise during the progression of the tourism industry.
4. Determining research objectives, The defined objectives will be linked to the existing problems in order to provide solutions to the aforementioned issues.
5. Conclusion, The conclusion is drawn from the result of data processing and analysis.

5. RESULT AND DISCUSSION

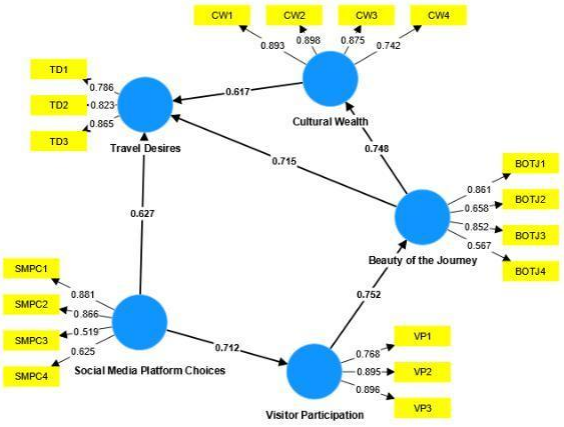

Figure 1. Conceptual Scheme

In the context of smart automation, various performance techniques, such as performance assessment and key performance indicators as expressions, should be clearly defined [15]. However, the complexity of performance assessment in smart automation must be acknowledged, which necessitates alternative performance techniques and better definitions to understand it.

5.1. Construct Reliability and Validity

To ensure the construct's reliability, two experiments were conducted, testing for two types of validity: convergence and discriminant. Convergence validity is examined to ensure that objects associated with variables correlate significantly, while discriminant validity tests show that items from different variables are not interrelated. By demonstrating the uniqueness of the dataset and the absence of associations between elements with different variables, the model is sufficiently robust to evaluate variable significance without the need for interconnections between elements [16].

5.2. Convergence validity

Several different criteria, such as Average Variance Extracted, Cronbach Alpha, Composite Reliability, and Outer Loadings, have been met in testing the convergence validity.

1. Cronbach's Alpha (0.7 Greater)
2. Composite Reliability (0.7 Greater)
3. AVE (0.5 Greater)

5.3. Discriminant Validity

In discriminant validity, Fornell and Larcker, Hetrotrait-Monotrait and cross-loading criteria are met.

1. Fornell and Larcker
2. HTMT
3. Cross loadings

Table 2. Reliability and Convergent Validity

	Cronbach's Alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted
The Beauty of the Journey	0.748	0.824	0.829	0.556
Cultural Wealth	0.878	0.824	0.915	0.730
Social Media Platform Choices	0.732	0.800	0.822	0.547
Travel Desires	0.767	0.781	0.865	0.681
Visitor Participation	0.814	0.825	0.890	0.731

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Figure 2. Cronbach's alpha

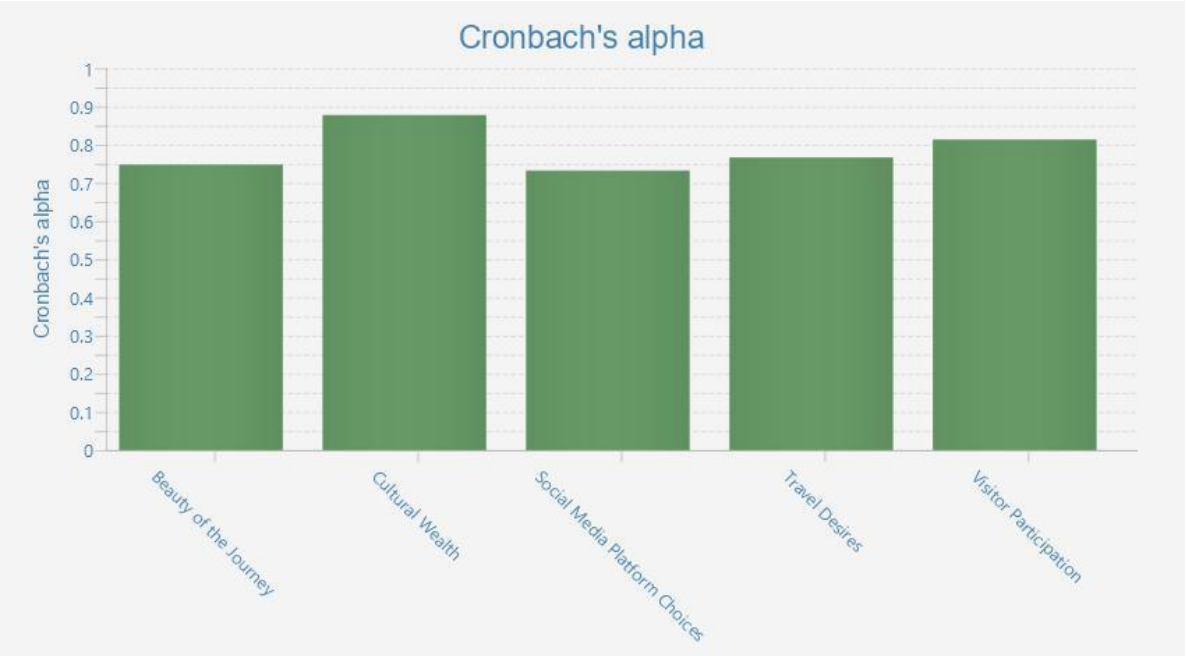

Figure 3. Composite reliability (rho_a)

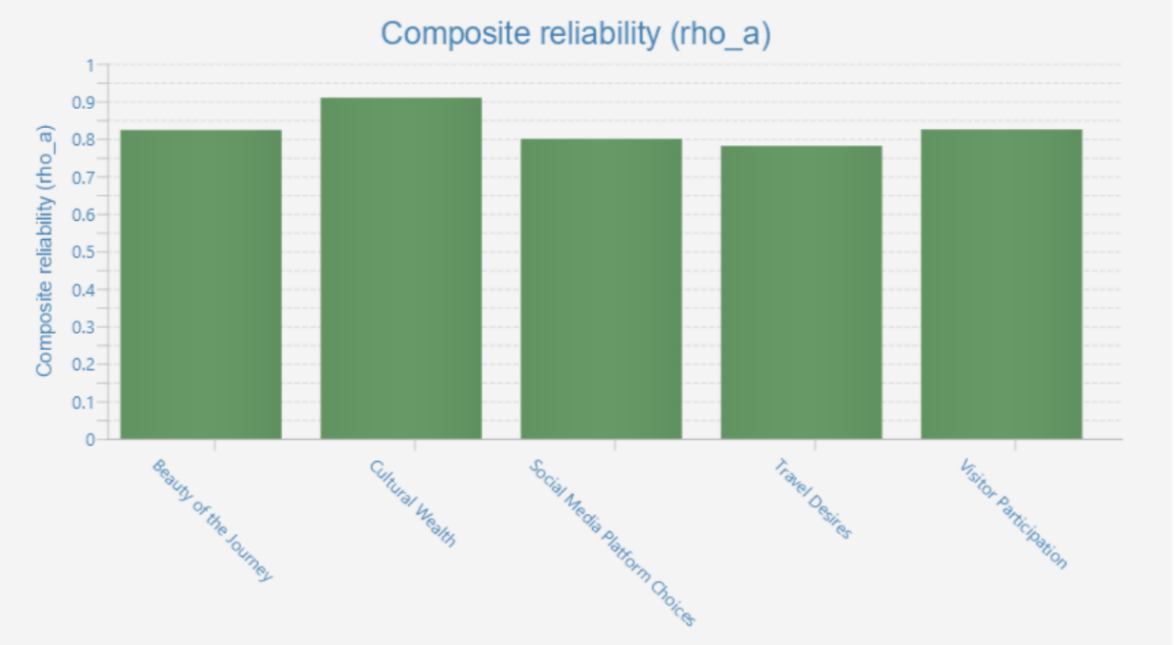

Figure 4. Composite reliability (rho_c)

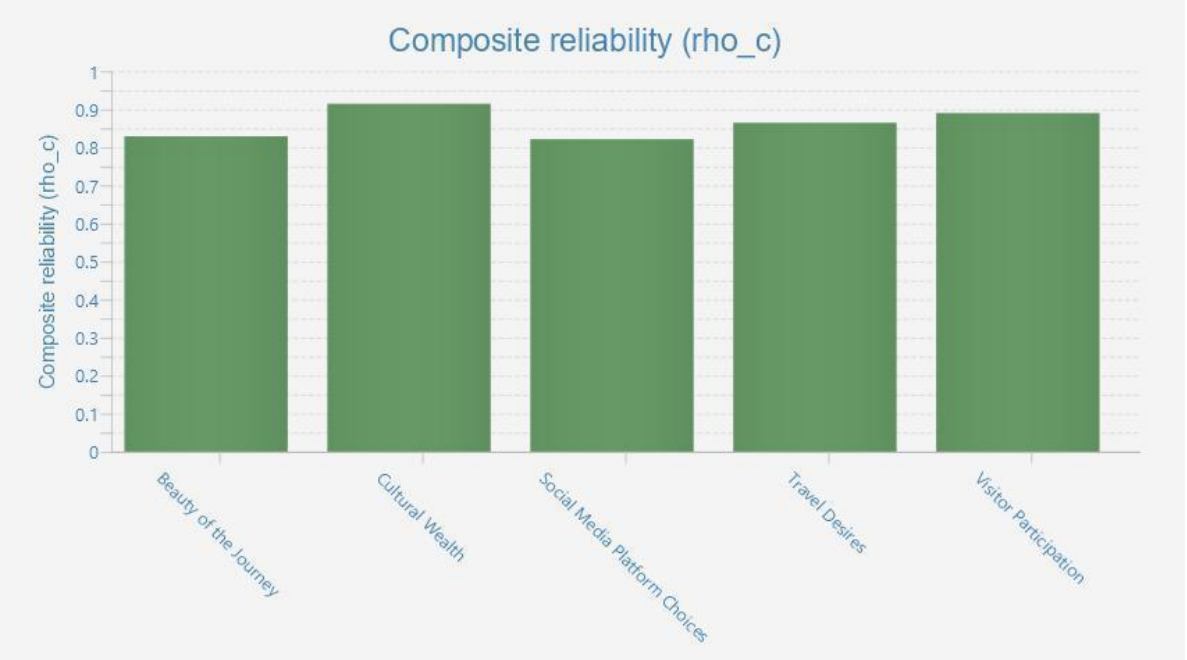

Figure 5. Average Variance Extracted (AVE)

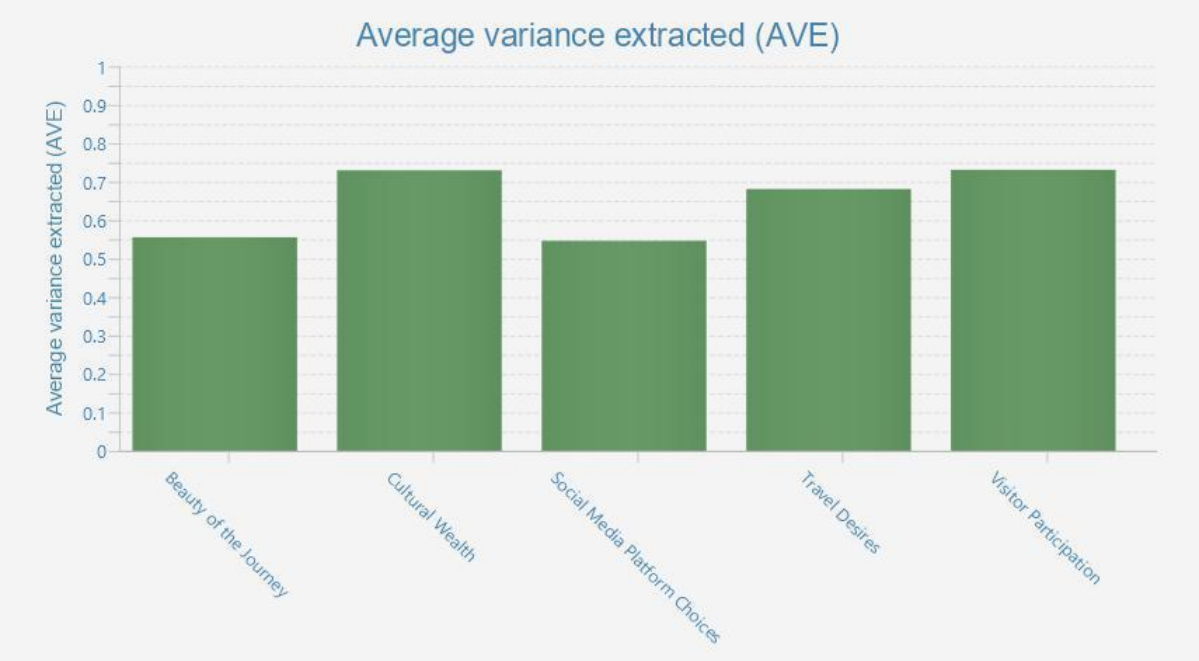

Table 3. Heterotrait Monotrait Table

	The Beauty of The Journey	Cultural Wealth	Social Media Platform Choices	Travel Desires	Visitor Participation
The Beauty of The Journey					
Cultural Wealth	0.805				
Social Media Platform Choices	0.778	0.692			
Travel Desires	0.859	0.695	0.751		
Visitor Participation	0.881	0.845	0.855	0.935	

Figure 6. Heterotrait Monotrait Ratio

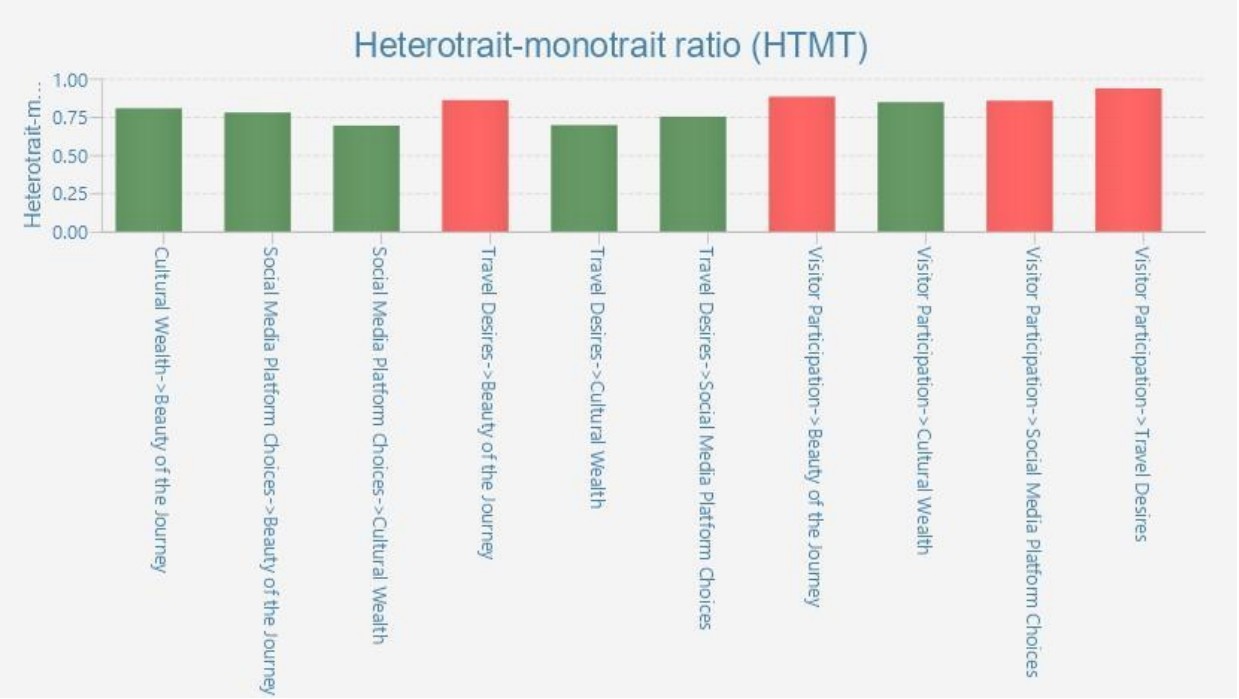

Table 4. Fornell Lacker Criterion

	The Beauty of the Journey	Cultural Wealth	Social Media Platform Choices	Travel Desires	Visitor Participation
Beauty of the Journey	0.745				
Cultural Wealth	0.748	0.854			
Social Media Platform Choices	0.644	0.635	0.739		
Travel Desires	0.715	0.617	0.627	0.825	

Table 5. Cross Loadings

	The Beauty of The Journey	Cultural Wealth	Social Media Platform Choices	Travel Desires	Visitor Participation
BOTJ 1	0.861	0.727	0.663	0.623	0.705
BOTJ 2	0.658	0.314	0.338	0.438	0.395
BOTJ 3	0.852	0.709	0.483	0.685	0.693
BOTJ 4	0.567	0.283	0.388	0.235	0.285
CW 1	0.707	0.893	0.571	0.552	0.716
CW 2	0.701	0.898	0.642	0.579	0.695
CW 3	0.668	0.875	0.542	0.616	0.623
CW 4	0.403	0.742	0.351	0.265	0.415
SMPC 1	0.535	0.539	0.881	0.562	0.555
SMPC 2	0.627	0.639	0.866	0.605	0.689
SMPC 3	0.172	0.166	0.519	0.129	0.231
SMPC 4	0.408	0.358	0.625	0.372	0.488
TD 1	0.493	0.382	0.593	0.786	0.557
TD 2	0.562	0.409	0.454	0.823	0.539
TD 3	0.695	0.696	0.512	0.865	0.726
VP 1	0.595	0.551	0.518	0.646	0.768
VP 2	0.231	0.172	0.129	0.166	0.519
VP 3	0.488	0.408	0.372	0.358	0.625

The tables (Tables 3, 4, and 5) present the Heterotrait-Monotrait, Fornell and Larcker, and cross- loading criteria, respectively. It is important to highlight that all of these values exceed the cutoff threshold of 0.85, and the heterotrait-monotrait values are further supported by the graphical representations in Figure 6.

However, the heterotrait-monotrait condition remains unfulfilled. This condition is also satisfied when the diagonal values in the corresponding columns are greater, as observed in the Fornell and Larcker criteria. Table 3 reveals significant correlations between each item and its respective variable but not with other items or items from different variables. Consideration should be given to the inclusion of additional items or elements from diverse variables.

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5.3. Bootstrapping Results and Hypothesis Testing

Table 6. P-values and T-values

	T Statistics (—O/STDEV—)	P Values
The Beauty of the Journey -¿ Cultural Wealth	13.197	0.000
The Beauty of the Journey -¿ Travel Desires	3.627	0.000
Cultural Wealth -¿ Travel Desires	0.749	0.454
Social Media Platform Choices -¿ Travel Desires	2.051	0.000
Social Media Platform Choices -¿ Visitor Participation	9.567	0.000
Visitor Participation -¿ Beauty of the Journey	11.735	0.000

Figure 7. The beauty of the Journey on Cultural Wealth

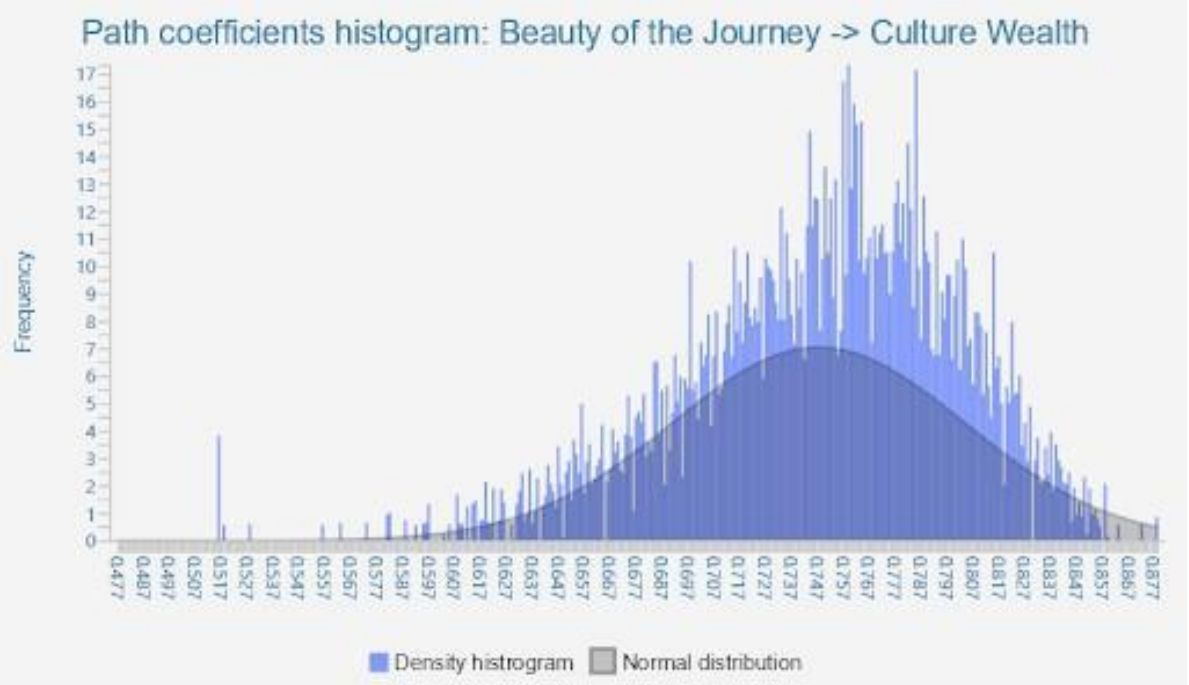

Figure 8. The beauty of the Journey on Travel Desires

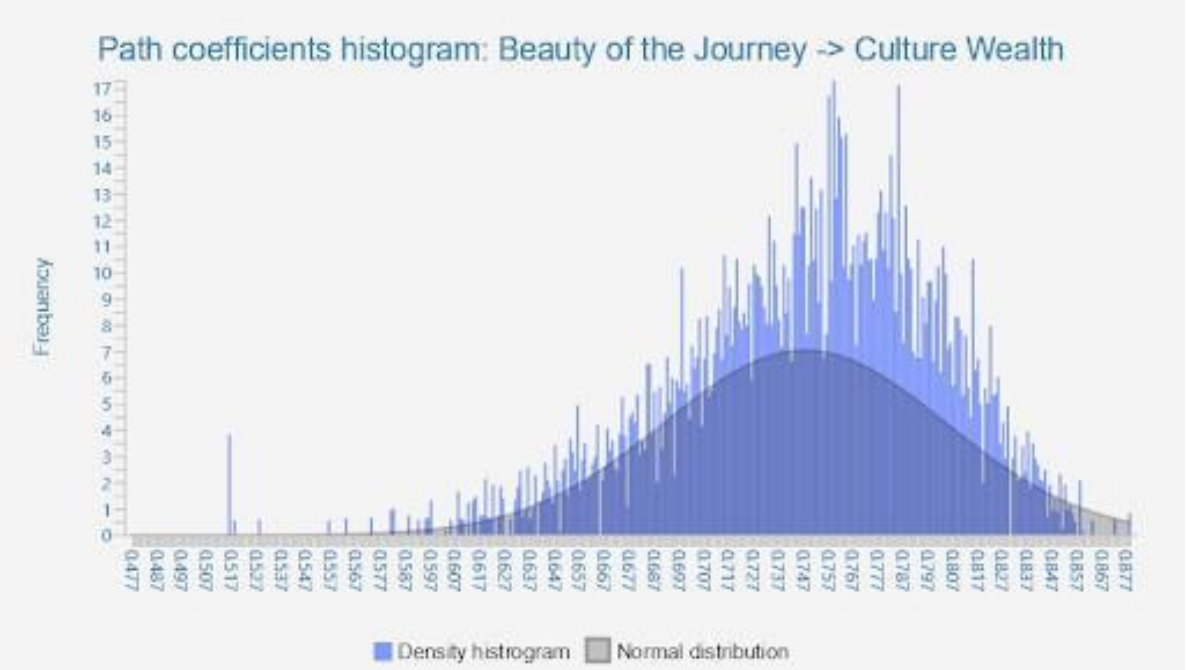

Figure 9. Cultural Wealth on Travel Desires

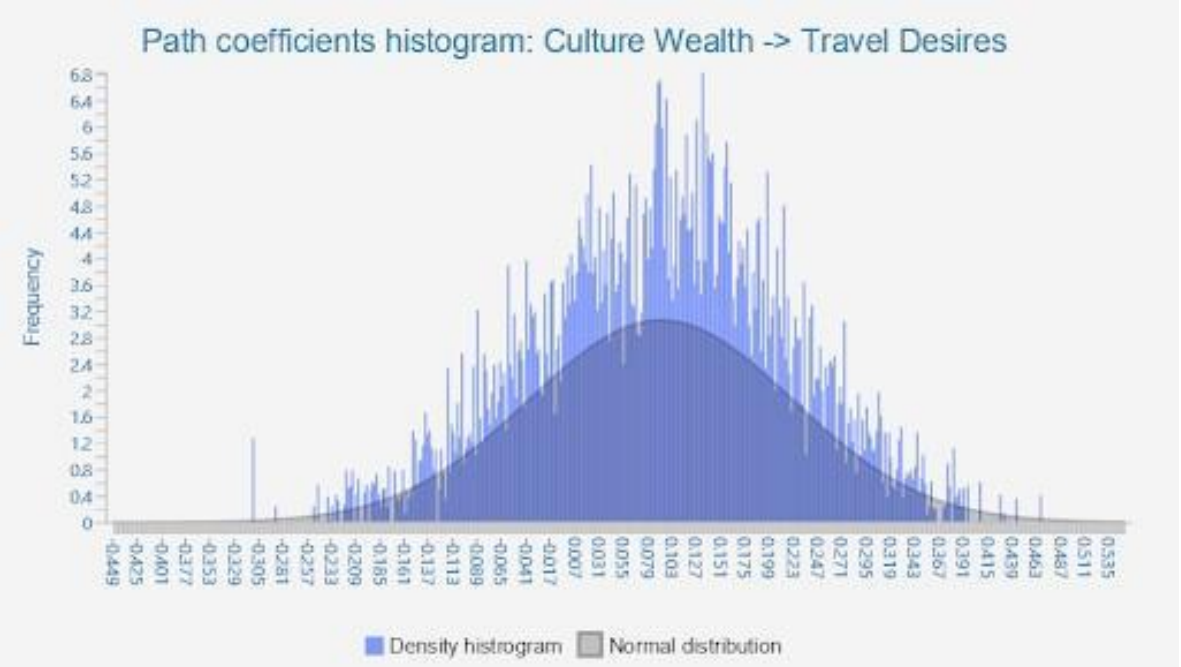

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Figure 10. Social Media Platform Choices on Travel Desires

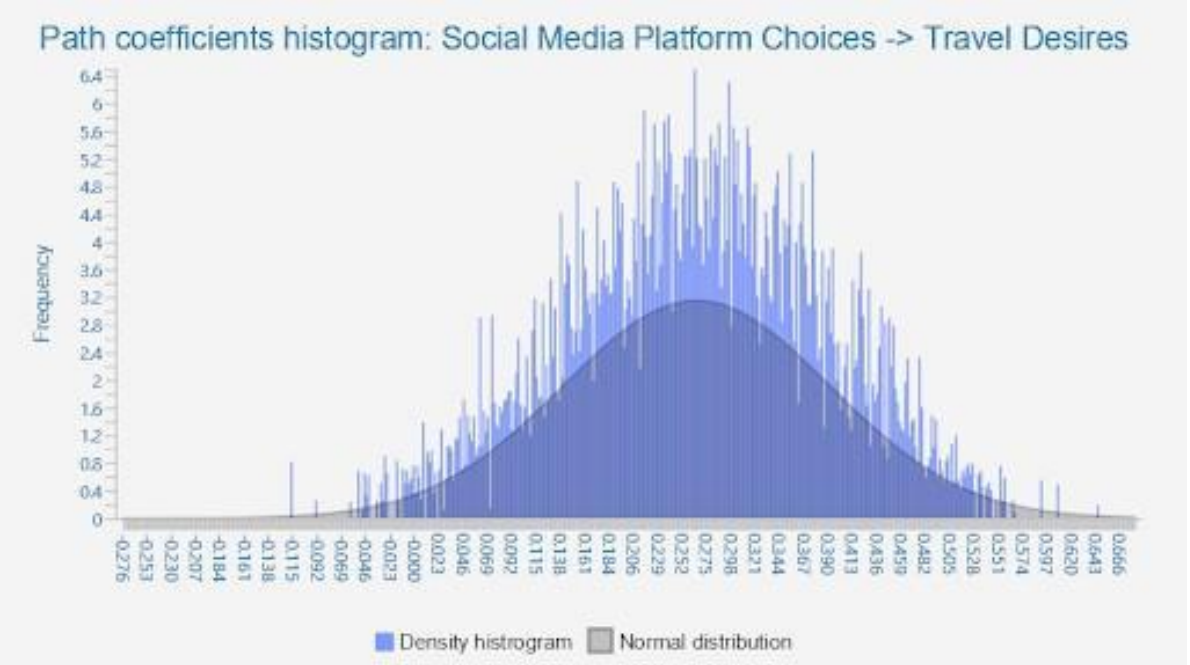


Figure 11. Social Media Platform Choices on Visitor Participation

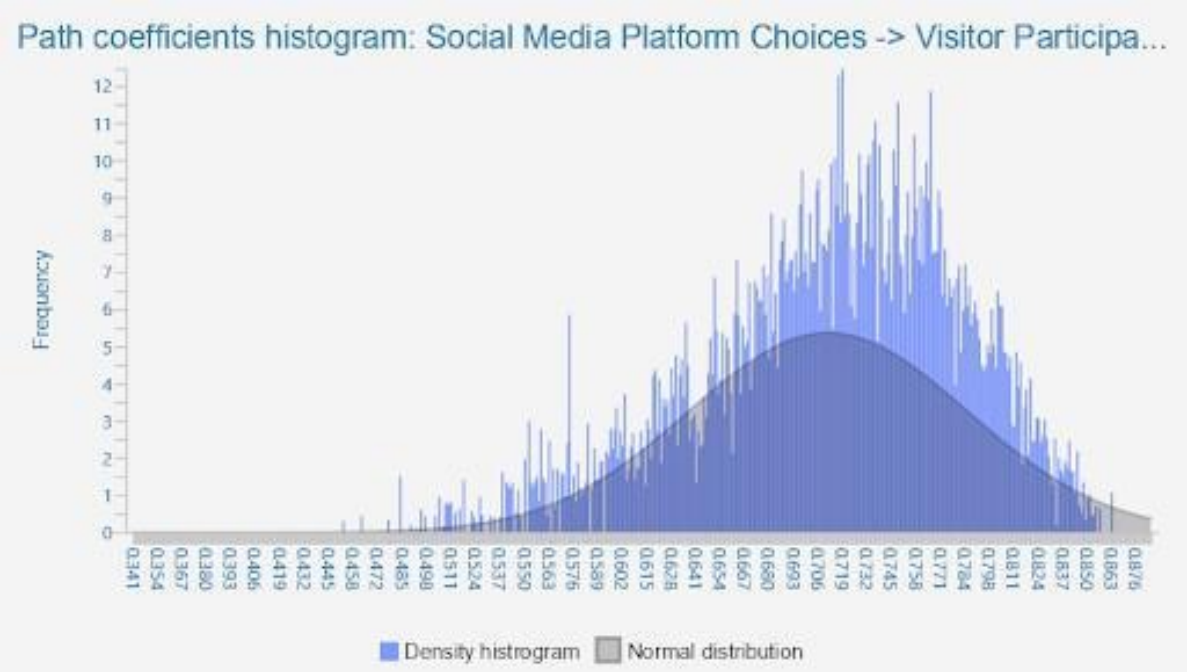


Figure 12. Visitor Participation in Beauty of the Journey

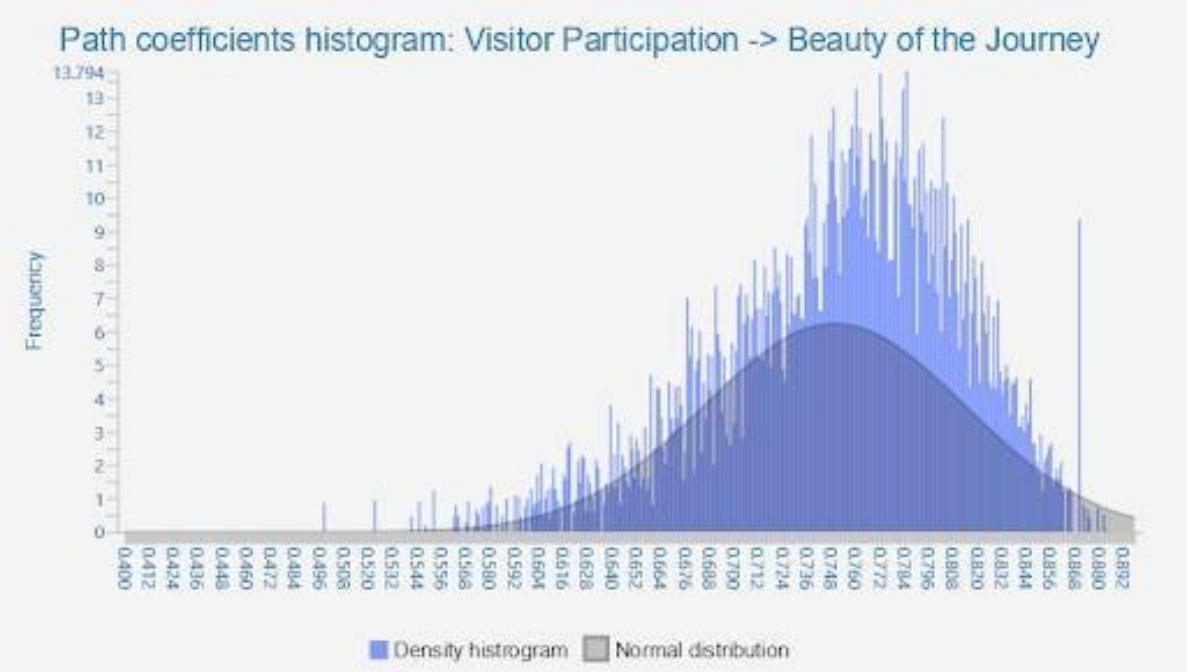
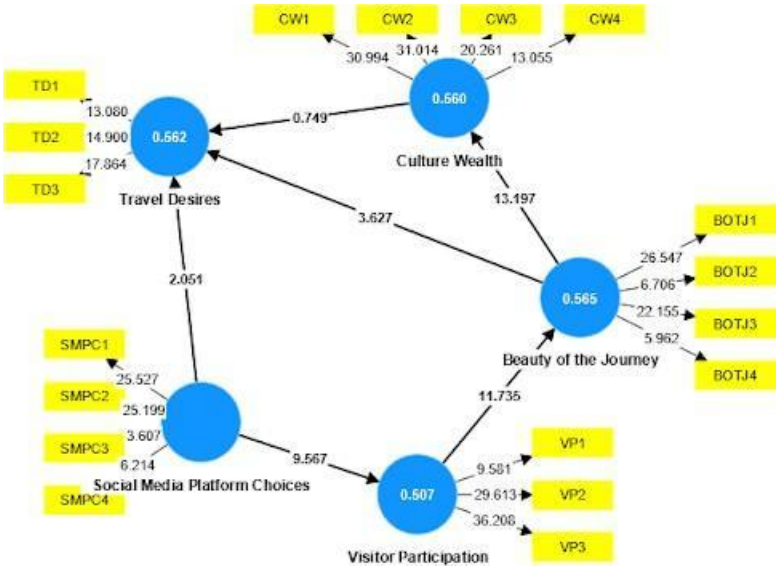


Figure 13. PLS Model T-test Results



5.3. Elucidation of Results

Upon observation, it becomes evident that the beta value, p-value, and t-value serve as valuable tools for determining the support of a hypothesis. Remarkably, the impact of travel beauty on cultural Wealth exhibits an extraordinarily low p-value of 0.000, well below the established threshold of 0.05. Moreover, there is a notable advantage when factors such as cultural Wealth influence the utilization of travel beauty in the process of acquiring competitiveness. The influence of cultural Wealth on competitiveness presents a significant and acknowledged benefit. Furthermore, the T-value for the targeted hypothesis surpasses 13.197,

as it represents the alternative hypothesis of a positive effect from the independent variable on the dependent variable. The directional value derived from the T-test will be subject to further examination and evaluation. Additionally, the initial average value, beta, offers insights into the positive or negative direction, with the positive values highlighting their positive associations. Figures 7, 8, 9, 10, 11, and 12 depict the path coefficients and the impact of independent factors on the dependent variable. Notably, figure 7 visually illustrates the correlation between variables and presents the model created in SMART Pls.

6. CONSTRUCT RELIABILITY AND VALIDITY

In summary, this study makes a significant contribution to the current body of literature by shedding light on the transformative influence of smart automation on the tourism sector, particularly for Small and Medium Enterprises (SMEs) [17]. Moreover, it offers valuable insights and actionable recommendations for SMEs to optimize their business practices. Future investigations in this domain will undoubtedly deepen our comprehension of the complex interplay between intelligent automation and SME performance, serving as a catalyst for the flourishing and triumph of SMEs in the age of smart automation.

The findings of this research carry significant implications for the business practices of Small and Medium Enterprises (SMEs) that deserve attention [18]. SMEs must acknowledge the paradigm-shifting po- tential of Smart Automation and proactively contemplate its integration into their operations. By embracing Smart Automation technology, SMEs can unlock heightened productivity, amplify revenue growth, and en- hance decision-making processes. A pivotal step for SMEs lies in investing resources to cultivate their Smart Automation prowess, encompassing facets such as preparedness, strategic planning, implementation, and im- pact evaluation. Through this comprehensive approach, SMEs can fully harness the advantages bestowed by Smart Automation, positioning themselves for a distinctive competitive advantage.

Moreover, the research findings emphasize the importance of well-established theories like the resource- based view and dynamic capabilities theory in explaining the impact of Smart Automation on the performance of the tourism industry. It is crucial for Small and Medium Enterprises (SMEs) to integrate these theoretical perspectives into their Smart Automation strategies and resource management approaches in order to attain an enduring competitive edge and maximize their performance results [19].

In the context of suggestions for further research, it is crucial to delve into the specific mechanisms and factors that act as mediators between the use of smart automation and the performance of the tourism industry in Small and Medium Enterprises (SMEs). Exploring the potential challenges and barriers to smart automation adoption in SMEs will also provide valuable guidance in developing effective strategies to overcome these obstacles. Additionally, conducting comparative studies across industries or diverse geographical contexts can provide a deeper understanding of the specific implications of smart automation on the performance of the tourism industry in SMEs [20].

Overall, this research makes a valuable contribution to the existing literature by revealing the impact of smart automation on the performance of the tourism industry in Small and Medium Enterprises (SMEs), as well as providing relevant practical implications for SMEs' business practices. Further research in this field will continue to broaden our understanding of the intricate dynamics between smart automation and SME performance, ultimately fostering the growth and success of small and medium enterprises in the era of smart automation.

7. SUGGESTIONS

It is recommended to conduct a comprehensive analysis of the specific mechanisms and fac- tors that mediate the relationship between smart automation adoption and entrepreneurial performance in SMEs. This could involve examining the role of organizational culture, employee attitudes, and technological infrastructure in facilitating the integration of smart automation.

1. Exploring the potential challenges and barriers to smart automation

adoption in SMEs would be valuable for developing effective strategies to overcome such hurdles. This could involve investigating factors such as cost, technical expertise, and resistance to change and identify- ing approaches to mitigate these barriers.

2. Conducting comparative studies across diverse industries or geographical contexts can pro- vide a deeper understanding of the context-specific implications of smart automation on SMEs' entrepreneurial performance. This could involve examining how different industries or regions adapt to and leverage smart automation technologies and identifying best practices that can be applied across sectors.
3. It is recommended to explore the long-term effects of smart automation on SMEs, including its impact on job creation, skill requirements, and overall business sustainability. This could involve examining the workforce implications of smart automation adoption and identifying strategies to reskill and upskill employees to ensure a smooth transition.
4. Investigating the ethical and social implications of smart automation in SMEs is another area worth exploring. This could involve examining issues such as data privacy, algorithmic bias, and the potential impact on local communities and developing guidelines or frameworks to ensure responsible and inclusive implementation of smart automation technologies.
5. It is important to consider the scalability and affordability of smart automation solutions for SMEs. Research could focus on identifying cost-effective and scalable automation technolo- gies that can be readily adopted by small and medium enterprises, thereby facilitating wider access and adoption in the sector.
6. Lastly, conducting longitudinal studies to track the evolution of smart automation in SMEs over time would provide valuable insights into its long-term impact on performance, com- petitiveness, and industry dynamics. This could involve examining the adoption patterns, success factors, and challenges faced by SMEs as they navigate the changing landscape of smart automation.

These suggestions can guide future research endeavors and contribute to a comprehensive understand- ing of the implications and potential of smart automation in SMEs.

8. ACKNOWLEDGEMENT

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REFERENCES

[1] E. Paget, F. Dimanche, and J.-P. Mounet, "A tourism innovation case: An actor-network approach," *Annals of Tourism research*, vol. 37, no. 3, pp. 828–847, 2010.

[2] V. K.-S. Liew, "The effect of novel coronavirus pandemic on tourism share prices," *Journal of Tourism Futures*, vol. 8, no. 1, pp. 109–124, 2022.

[3] S. Ivanov and C. Webster, "Conceptual framework of the use of robots, artificial intelligence and service automation in travel, tourism, and hospitality companies," *Robots, artificial intelligence, and service automation in travel, tourism and hospitality*, pp. 7–37, 2019.

[4] S. Karim, F. Naz, M. A. Naeem, and S. A. Vigne, "Is fintech providing effective solutions to small and medium enterprises (smes) in asean countries?," *Economic Analysis and Policy*, vol. 75, pp. 335–344, 2022.

[5] G. N. Uunona and L. Goosen, "Leveraging ethical standards in artificial intelligence technologies: A guideline for responsible teaching and learning applications," in *Handbook of Research on Instructional Technologies in Health Education and Allied Disciplines*, pp. 310–330, IGI Global, 2023.

[6] S. Suriyankietkaew, K. Krittayaruangroj, and N. Iamsawan, "Sustainable leadership practices and com- petencies of smes for sustainability and resilience: A community-based social enterprise study," *Sustain- ability*, vol. 14, no. 10, p. 5762, 2022.

[7] H. Mousazadeh, A. Ghorbani, H. Azadi, F. A. Almani, A. Zangiabadi, K. Zhu, and L. D. Da´vid, "Devel- oping sustainable behaviors for underground heritage tourism management: The case of persian qanats, a unesco world heritage property," *Land*, vol. 12, no. 4, p. 808, 2023.

[8] A. Restu, E. Trihayuningtyas, and R. W. Rahtomo, "The partnership of government and creative industry in developing creative tourism in kampung batik kauman, surakarta," *International Journal of Sustainable Competitiveness on Tourism*, vol. 1, no. 02, pp. 62–68, 2022

[9] A. Lutfi, A. L. Al-Khasawneh, M. A. Almaiah, A. Alsyouf, and M. Alrawad, "Business sustainability of small and medium enterprises during the covid-19 pandemic: The role of ais implementation," *Sustain- ability*, vol. 14, no. 9, p. 5362, 2022.

[10] F. A. Ghansah, J. Chen, and W. Lu, "Developing a user perception model for smart living: A partial least squares structural equation modelling approach," *Building and Environment*, p. 109399, 2022.

[11] C. Sriliasta, D. S. S. Wuisan, and T. Mariyanti, "Functions of artificial intelligence, income investment instrument, and crypto money in era of the fourth revolution," *International Transactions on Artificial Intelligence*, vol. 1, no. 1, pp. 117–128, 2022.

[12] V. Ndou, E. Hysa, and Y. Maruccia, "A methodological framework for developing a smart-tourism desti- nation in the southeastern adriatic–ionian area," *Sustainability*, vol. 15, no. 3, p. 2057, 2023.

[13] M. Wahyudi, V. Meilinda, and A. Khoirunisa, "The digital economy's use of big data," *International Transactions on Artificial Intelligence*, vol. 1, no. 1, pp. 62–70, 2022.

[14] J. F. Hair Jr, G. T. M. Hult, C. Ringle, and M. Sarstedt, "A primer on partial least squares structural

equation modeling (pls-sem) sage publications," *Thousand Oaks, CA, USA*, 2016.

[15] M. Dewan, M. Murshed, and F. Lin, "Engagement detection in online learning: a review," *Smart Learning Environments*, vol. 6, no. 1, pp. 1–20, 2019.

[16] S. Epskamp, M. Rhemtulla, and D. Borsboom, "Generalized network psychometrics: Combining network and latent variable models," *Psychometrika*, vol. 82, pp. 904–927, 2017.

[17] S. Hampton, R. Blundel, A. Wahga, T. Fawcett, and C. Shaw, "Transforming small and medium-sized enterprises to address the climate emergency: The case for values-based engagement," *Corporate Social Responsibility and Environmental Management*, vol. 29, no. 5, pp. 1424–1439, 2022.

[18] L. Oyewobi, O. F. Adedayo, S. O. Olorunyomi, and R. A. Jimoh, "Influence of social media adoption on the performance of construction small and medium-sized enterprises (smes) in abuja–nigeria," *Engineer- ing, Construction and Architectural Management*, 2022.

[19] S. Teerasoponpong and A. Sopadang, "Decision support system for adaptive sourcing and inventory management in small-and medium-sized enterprises," *Robotics and Computer-Integrated Manufacturing*, vol. 73, p. 102226, 2022.

[20] J. Mendy and M. Rahman, "Supporting smes' internationalisation through a deeper understanding of human and technology barriers: Applying effective hrm processes from a developing country," *Journal of Organizational Effectiveness: People and Performance*, vol. 6, no. 4, pp. 205–226, 2019.

[21] Purnama, Suryari, and Wahyu Sejati. "Internet of Things, Big Data, and Artificial Intelligence in The Food and Agriculture Sector." International Transactions on Artificial Intelligence 1.2 (2023): 156-174.

[22] Anwar, Muhammad Rehan. "Analysis of Expert System Implementation in Computer Damage Diagnosis with Forward Chaining Method." International Transactions on Artificial Intelligence 1.2 (2023): 139-155.]

[23] Hudiono, Rini Kartika, and Sri Watini. "Remote Medical Applications of Artificial Intelligence." International Transactions on Artificial Intelligence 1.2 (2023): 182-187.

[24] Prawiyogi, Anggy Giri, and Riya Widayanti. "Exploratory Activities in Educational Games using Fuzzy Logic." International Transactions on Artificial Intelligence 1.2 (2023): 188-194.

[25] Jayanagara, Oscar, and Dewi Sri Surya Wuisan. "An Overview of Concepts, Applications, Difficulties, Unresolved Issues in Fog Computing and Machine Learning." International Transactions on Artificial Intelligence 1.2 (2023): 213-229.