RESEARCH ARTICLE

Sustainable Tourism Industry Development: A Collaborative Model of Open Innovation, Stakeholders, and Support System Facilities

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ABSTRACT Sustainable development in the tourism industry is a significant challenge requiring various stakeholders' collaborative efforts. The tourism industry must adopt sustainable business practices and improve its performance to overcome this. Support system facilities, stakeholders, and the application of open innovation can help increase optimal performance and support in achieving a sustainable tourism industry. Therefore, the main objective of this research is to propose a collaborative model of open innovation, stakeholders, and support system facilities to develop a sustainable tourism industry in a dynamic and competitive environment. This study uses quantitative methods for analysis. The sampling technique used purposive sampling with the criteria of SMEs scattered around the tourist area. The research model was analyzed using Partial Least Square Structural Equation Modeling (PLS-SEM) using data from 358 respondents from SMEs in the tourist area of Rembang Regency, Central Java, Indonesia, and Banyuwangi Regency, East Java, Indonesia. The study results show that performance improvements can significantly and positively affect the sustainability of the tourism industry ($\beta = 0.530$; $p = 0.005$, $p \leq 0.05$). The tourism industry's performance can be achieved by implementing open innovation, participation of stakeholders, support system facilities, and environmental dynamism ($p \leq 0.05$). However, environmental competitiveness is not proven to improve the tourism industry's performance ($\beta = 0.022$; $p = 0.120$, $p \geq 0.05$), because every organization and stakeholder is interdependent. Theoretically, this research contributes to the debate about how open innovation, stakeholders, support system facilities, and environmental dynamism can improve tourism's performance, ultimately achieving a sustainable industry. Practically, this research benefits stakeholders and SMEs in formulating an appropriate policy for achieving a green industry.

INDEX TERMS Sustainable tourism industry, tourism industry performance, open innovation, stakeholders, support system facilities.

I. INTRODUCTION

Sustainability has become a global development policy, including in the industrial sector. Sustainability is meeting the needs of organizations and stakeholders to achieve profits for economic growth, social welfare, and environmental sustainability in an integrated manner [1], [2], [3], [4], [5], [6], [7]. The aim of implementing the concept of sustainability is to ensure the sustainability of the industrial sector in the future. This is in line with the goals of the Sustainable Development Goals (SDGs) adopted by the United Nations (UN) in setting

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global targets for ending poverty, protecting the planet, and ensuring that all people can experience peace and prosperity in the future [8], [9], [10], [11]. The SDGs agenda calls for a global partnership between all destinations and stakeholders in the public and private sectors to work together to achieve economic, social, and environmental goals aligned with the needs of all generations [8].

In Indonesia, the Industry's obligation to apply the concept of sustainability, which is referred to as the green Industry, is written in Law No. 3 of 2014. A green industry is an industry that emphasizes efficiency and effectiveness in the sustainable use of resources in the production process in order to achieve both industrial development and conservation of

environmental functions, and to bring benefits to society [12]. In the 2015-2035 National Industrial Development Master Plan, it is stated that the concept of sustainability is realized through the national industrial development mission, including increasing the role of national industry as a pillar and driver of the national economy, enhancing industries that are independent, competitive, and advanced, as well as green industries [12]. The Indonesian government's strategy to achieve the goal of national industrial development is to direct the industry to enter green industrial areas [12]. One of the industries that is currently being prioritized as a green industry in Indonesia is the tourism industry.

The tourism industry is one of the industries that have the potential to contribute to the regional and national economy [13], [14], [15], [16]. The green industry in tourism refers to eco-friendly and sustainable tourism practices, which aim to minimize negative impacts on the environment and improve social and economic well-being in tourist destinations [1], [2], [11]. This is in line with Law No. 3 of 2014 concerning Industry, which promotes the development of environmentally friendly and sustainable industries to increase national economic growth. Some of the important roles of the tourism industry in achieving SDGs are SDGs 8 (decent work and economic growth), SDG 12 (responsible consumption and production) goals, and SDG 14 (life below water) goals [17], [18].

In an industry achieving a green industry can be supported by optimal performance. The role of innovation [19], [20], [21], [22], support system facilities [13], [23] and the role of stakeholders [13], [24], [25], [26] in operating all tourism industry activities can achieve optimal performance in the tourism industry. The fact that sustainable tourism in a dynamic environment must be accommodated in the era of open innovation (OI) [27], [28], [29]. Sustainability-oriented OI is open innovation to meet economic, environmental, and social organizational needs [30], [31], [32], [33]. Research conducted by Troise et al. [34] and Barham et al. [35] shows success in implementing sustainability-oriented open innovation in large industries. OI is becoming a significant paradigm for tourism industry businesses [28] and new approaches to effectively address challenges related to sustainability [27]. The importance of sustainability is not only for large industries but also for SMEs that support the operational activities of the tourism industry in a dynamic and competitive environment [13]. Therefore, open innovation that is oriented toward sustainability needs to be applied to SMEs to achieve sustainability, especially in activities related to the environment, social, employees, society, and ethics [30], [36], [37]. For SMEs, the existence of open innovation processes can lead to changes in organizational systems for the better. This means improving their ability to understand market conditions, increasing the knowledge of organizational members, and improving collaboration with various stakeholders [38], [39]. Collaboration with stakeholders, in this case, relates to ele-

ments of collaboration, joint creativity, and the attainment of new knowledge and management within an organization [38].

The role of stakeholders is also needed to achieve optimal performance and sustainability in the tourism industry [13], [24], [25], [37]. Stakeholders involved in this innovation can be the same as stakeholders involved in maintaining sustainability in the tourism industry, namely the government, private business actors, local communities, communities, and environmental organizations [13]. Stakeholders are various parties involved and interacting with each other who create value in developing, supporting, and building the tourism industry [40]. Collaboration factors with various parties are very helpful in improving the performance of the tourism industry through various policies and strategies implemented [13], [24], [37]. The government can act as a facilitator and regulator in supporting innovation in the tourism industry, for example, by providing incentives for business people to innovate to achieve sustainability [37]. Businesses can also play an important role in innovation, such as developing products and services that are environmentally friendly, using green technology, and looking for new ways to enhance the tourist experience while taking sustainability into account [24]. In addition, environmental organizations can also play a role in innovation by providing ideas and support in developing tourism products and services that are responsible for the environment and society [40]. Research by Wang et al. [41] and Jermsittiparsert et al. [42] shows that stakeholders consisting of local government, central government, real estate development companies, expert groups, administration of architectural heritage protection, and architectural heritage construction companies are considered essential for sustainable development heritage of tourism architecture in the Asian tourism industry. They have an important role to play in ensuring that facilities built for tourism not only meet the needs of the industry but also pay attention to environmental sustainability and the well-being of local people.

To improve optimal tourism performance and achieve sustainability in the tourism industry, many countries such as Taiwan [43], Italy [44], Croatia [45], China [46], Turkey [47], Australia [48] have used support facilities such as technology, waste management, clean water sources, and human resource development programs [13], [49], [50]. Achieve sustainable tourism through support system facilities that help improve the tourism industry's performance. Support system facilities refer to the tools, technology, and infrastructure that facilitate the smooth operation of tourism, ensuring that they are sustainable and meet the needs of all stakeholders [13], [23]. The use of support system facilities can help the tourism industry increase operational efficiency, improve service quality, and reduce negative environmental impacts [13], [50]. The study conducted by Achmad et al. [13] shows that support system facilities positively increase the tourism industry's performance, which will later impact a sustainable tourism industry.

Improving the tourism industry's performance is also influenced by environmental dynamism and competitiveness. In this uncertain tourism industry, studying and understanding tourist behavior during and post pandemic is of critical importance to all practitioners and researchers in the tourism industry [51]. Meanwhile, the competitive factors, lack of environmental patterns and uncertainties in the business environment require the industry to be able to use knowledge and technology effectively [19], [20], [22], [52], so that the industry is required to quickly adapt to its environments, such as government regulations, technology, demands, and community needs [53]. This study reviews environmental uncertainty factors based on PESTLE factors, including political, economic, social, technological, legal, and environmental factors [54]. This framework is used to analyze the external environment of industrial organizations. This framework focuses on the development environment of political, economic, sociodemographic, technological, legal, and ecological factors that shape the macro-environmental context in which industry and SMEs operate [52], [53], [54]. These factors can provide opportunities for developing strategies in the tourism industry carried out by stakeholders to deal with environmental uncertainties and a competitive environment.

The current problems in the tourism industry are optimizing open innovation practices, collaborating with stakeholders, strengthening support system facilities, and dealing with a dynamic environment to develop a sustainable tourism industry. In addition, it is important to emphasize the involvement of various stakeholders such as the government, tourism area management agencies, communities, society, the private sector, and individual shop owners in sustainable tourism development. System support facilities such as waste management, clean water sources and power sources are relevant to research issues in developing sustainable industrial tourism. By addressing these issues, this research provides valuable insights for developing a sustainable tourism industry through open innovation, stakeholders, system support facilities, and adaptation to dynamic and competitive environment changes.

Based on the explanation regarding the importance of open innovation in improving industrial performance, both large industries and SMEs [19], [20], [21], [22], each play a role towards the sustainability of an industry. However, this research has not measured the existing facilities in the tourism industry. And from the description of several previous studies [13], [23], [26], it has been shown that support system facilities have a positive impact in helping improve the performance of the tourism industry. However, the research has not measured open innovation and competitive environmental impact in the tourism industry. Meanwhile, research from [24], [25], and [40] only explains the influence of the role of stakeholders in improving the performance and potential of the tourism industry. However, this research has not measured the role of open innovation and a competitive and dynamic environment in the tourism industry. Each plays a role in achieving more optimal tourism industry

performance and supporting organizational goals in achieving sustainability. However, to researchers' knowledge, the relationship between open innovation, stakeholders, and support system facilities in improving the tourism industry's sustainability performance has not been examined. By integrating these three factors, this research offers a valuable contribution to achieving a sustainable industry by presenting a comprehensive model for improving the performance of the tourism industry and promoting the development of a sustainable tourism industry. The contribution of this research is very important, especially in the context of developing a sustainable tourism industry, because it provides a more comprehensive picture of the factors that must be considered in developing a sustainable tourism industry. In addition, this research provides another important contribution in providing insights on how to promote innovation in the tourism industry through a collaborative model involving various stakeholders in policy making. This will help the tourism industry achieve sustainable growth and promote sustainable economic and social development in areas affected by the tourism industry.

II. THEORITICAL BACKGROUND

Previous research has provided sufficient arguments regarding the role of each innovation on industry performance [19], [20], [21], [22], the role of stakeholders on industry performance [24], [25], [40], and support system facilities for the tourism industry [13], [23], [26]. Thus this research encourages integrating the three factors of innovation, stakeholder participation, and support system facilities to achieve optimal industrial performance.

Innovation, stakeholder participation, and support system facilities are important aspects of developing and improving the tourism industry's performance. Increasing the tourism industry is hoped to achieve sustainable growth and promote sustainable economic and social development in areas affected by the tourism industry, whether it is large, medium, and small-scale companies [53], [55].

A. SUSTAINABILITY IN TOURISM INDUSTRY

Sustainability in the tourism industry has become a topic of increasing importance in recent years. Sustainable development is an important concept in the sustainable tourism industry [56]. This concept combines environmental, economic, and social aspects necessary to achieve sustainable growth and protect valuable natural and cultural resources [49], [57]. According to Zhang et al. [49], the importance of measuring business performance based on three dimensions, namely environmental, social, and economic, can assess the impact of business activities on the environment, local community, and local economy [56], [58]. The sustainable tourism industry promotes environmentally friendly practices, efficient use of resources, and community participation in tourism activities [58]. The sustainable tourism industry pays attention to the interests and needs of local communities and seeks to promote the local economy by developing locally produced products and services [50]. In addition,

the sustainable tourism industry also pays attention to environmental welfare by promoting sustainable management, conservation of natural resources, and reducing the negative impacts resulting from tourism activities [50]. This is done by considering the development of environmentally friendly infrastructure, reducing waste, and reducing carbon emissions [50]. The sustainable tourism industry significantly impacts economic development, environmental preservation, and social development [50]. However, to achieve sustainable tourism sustainability, there needs to be proper management and regulation and the active participation of all stakeholders, including local communities, government, and the tourism industry [24]. Therefore, the definition of sustainability in the context of the tourism industry is the concept of meeting the needs of industry and stakeholders to achieve profits for economic growth, social welfare, and environmental sustainability in an integrated manner [5], [30].

B. STAKEHOLDER

In the tourism industry, stakeholders are needed in developing and carrying out innovations or strategies [60]. Stakeholders in the tourism industry are individuals or groups who have an interest in or influence the success or failure of the tourism industry [60]. Stakeholder contexts are various parties that collaborate and create value in developing, supporting, and building the tourism industry [13]. In Indonesia's tourism industry context, various relevant parties are the government, tourism area management agencies, local communities, and other industry parties. The role of stakeholders in the tourism industry is of great concern in dealing with the SDGs and can provide policy guidelines and strategic engagement [40]. Stakeholders can provide support in the form of policies and regulations that support the growth of the tourism industry and ensure that tourism activities are carried out sustainably and responsibly [24], [25]. Research by Amoako et al. [24] shows that the stakeholders involved, such as employees, government, community and society, the private sector, and individual shop owners, perceive factors that increase or limit performance progress in tourism. In addition, stakeholders also point out that to ensure sustainability in the industry [24]. Research from Serravalle et al. [25] stakeholders from a certain group of people in the organization can create innovations in the tourism industry to improve sustainable tourism organizations' performance. Overall, stakeholders in the tourism industry have an important role in promoting a sustainable tourism industry by ensuring that tourism activities are carried out responsibly and sustainably and provide significant economic and social benefits to local communities. Thus, in this study, it is hypothesized:

H1 : Stakeholders have positive influence on the tourism industry performance significantly.

C. OPEN INNOVATION

In a dynamic environment, innovation has become a very important topic. It is regarded as one of the key factors for industry development and survival in market competition [61]. Open innovation has attracted a lot of attention in innovation management research [30]. Industries that can innovate simultaneously will have better performance when compared to industries that do not innovate [52]. Research conducted by Rumanti et al. [55] states that innovation capabilities and open innovation practices play an important role in improving industry performance, especially SMEs. SMEs that can innovate open innovation can facilitate greater industrial performance. Research [20] shows that within an industry, especially in SMEs, the value of top management knowledge and knowledge creation practices influences open innovation, affecting organizational performance. Capability in open innovation plays an important role in improving organizational performance [20]. Research from Davoudi et al. [21] in 30 corporate industries states that open innovation has a significant positive relationship with organizational performance. The commitment-based human resource practice factor positively influences the innovation climate, and that innovation climate contributes to open innovation both inbound and outbound. Open innovation positively affects SME industry performance [22]. The context of open innovation in this study is a decentralized innovation process based on the flow of knowledge across organizational boundaries, whether it involves money or not, and through various mechanisms depending on the business model of the organization. managed. This definition highlights the importance of collaboration in the innovation process in the tourism industry. In this way, organizations can accelerate the development of new products or services, improve the quality of innovation, and create added value for customers with mechanisms adapted to organizational conditions [62]. The main flow of knowledge in open innovation is inbound and outbound [30]. Inbound relates to acquiring knowledge from external parties for internal use, while outbound relates to utilizing internal knowledge for external parties [30], [63]. Therefore, a positive relationship exists between innovation gained from open innovation and industry performance. From this explanation, the second hypothesis can be formulated as follows:

H2 : Open innovation have positive influence on the tourism industry performance significantly.

D. SUPPORT SYSTEM FACILITIES

Providing a facility support system in the tourism industry greatly influences industry performance [13]. Support system facilities in the tourism industry refer to infrastructure and services that can be developed to support sustainable tourism operations [64]. Tourism development requires the support systems necessary for tourists to meet their needs [13]. As tourism develops, it will be equipped with adequate facilities because the carrying capacity needs of tourists reflect the development of tourism in the area [65]. Support system facilities in this study refer to the tools, technology, and infrastructure that facilitate the smooth operation of tourism, ensuring that they are sustainable and meet the needs

of all stakeholders. Facility factor mapping is one of the keys that support industrial performance improvement. The study conducted [13] states that support system facilities, including waste management, power sources, and clean water sources, positively influence the performance of the tourism industry. Factors supporting system facilities that affect the improvement of the tourism industry's performance to produce strategies in the development of the tourism industry. Success in increasing the potential and performance of the tourism industry depends on the facility support system [26]. Support facilities can influence industrial performance to formulate organizational and industrial development cooperation in supporting the development of innovation systems. Meanwhile, Nainggolan et al. [23] state that the right facility system can form a green industrial area in the industry.

H3 : Support system facilities have positive influence on the tourism industry performance significantly.

E. ENVIRONMENTAL DYNAMISM
Environmental dynamism in the tourism industry refers to changes in the internal and external environment that affect the tourism industry [13]. That way, the industry must be able to innovate and use technology effectively so that an organization can quickly adapt to its environment [19], [52]. High environmental dynamism means market demand, technological change, and the institutional environment is unstable and unpredictable, while low environmental dynamism is the opposite [66]. Environmental changes can have both positive and negative impacts on the tourism industry. For example, government policies that support the development of the tourism industry can have a positive impact. In contrast, climate change and natural disasters can have a negative impact on the tourism industry [54]. According to research conducted by Wiratmadja et al. [52], technological capabilities, owner-manager characteristics, and environmental dynamism are positively influencing innovation to improve organizational performance. In an environment of dynamism, the industry needs to have an effective risk management and recovery strategy [13]. This can help the tourism industry to strengthen resilience to environmental change and reduce negative impacts on the environment and local communities. In the context of the tourism industry, environmental dynamism refers to the environmental conditions of the industry, which are patternless and unstable and require organizations to adapt quickly to their environment to continue exploring and exploiting external pressures. From the explanation of the paragraph above, this study proposes the following hypothesis:

H4 : Environmental dynamism strengthens the positive effect of stakeholders on the tourism industry performance.

F. ENVIRONMENTAL COMPETITIVENESS
In the tourism industry, there is competition between businesses that come together and are interrelated to produce goods and services to meet the needs of tourists in carrying out tourism activities [13], [19]. Environmental competitiveness is a concept that refers to the ability of an organization to achieve competitive advantage by considering environmental factors or sustainability aspects [13]. Environmental competitiveness in the tourism industry refers to the ability of each industry, especially large, medium, and small-scale companies, to maintain their attractiveness to visitors and tourists while protecting natural resources and the surrounding environment [19]. To achieve competitiveness in the environment, the tourism industry needs to ensure that they have sustainable and environmentally friendly business practices [67]. According to Nadalipour et al. [57], the competitive competitiveness of each stakeholder in the tourism industry is considered in improving the performance of the tourism industry, especially for sustainable competitiveness requiring consideration of economic, socio-cultural, and ecological dimensions. In order to increase environmental competitiveness in the tourism industry, stakeholders with interest in the tourism industry, such as governments, tour managers, communities, and local communities, need to work together to promote sustainable business practices and maintain natural resources and the environment which are tourist attractions [57]. Environmental competitiveness in the context of the tourism industry refers to the ability of a tourism destination and tourism industry organization to maintain the attractiveness and quality of its business. In the context of the tourism industry, the success of a destination in creating a healthy and sustainable environment can become a tourist attraction for tourists who want to experience a different and more responsible experience. Based on the explanation above, a hypothesis is proposed:

H5 : Environmental competitiveness strengthens the positive effect of stakeholders on the tourism industry performance.

G. TOURISM INDUSTRY PERFORMANCE
The tourism industry is an industry that is useful in economic growth by providing employment, income, cost of living, and increasing other sectors of production in the country [13], [65]. The tourism industry is a business that gathers and is interconnected to produce goods and services to meet the needs of tourists in carrying out tourism activities [13]. The academic literature has extensively researched tourism industry performance, with many studies examining various aspects, including environmental, economic, and social impacts [13]. Tourism industry performance refers to the ability of the tourism industry to achieve predetermined goals, such as increasing the number of visitors, income, and tourist satisfaction [13]. This concept involves evaluating various factors that influence the tourism industry's performance, including economic, social, and environmental aspects. One approach to evaluating the performance of the tourism industry is through support system facilities [13], [26], the role of stakeholders [24], [25], [40] and innovations made [68], [20], [21]. Researchers can evaluate

the tourism industry's performance by measuring the quality of these factors. Studies from Nadalipour et al. [57] state that sustainable tourism considers economic, sociocultural, and ecological dimensions on the one hand and considers all stakeholders' needs to increase performance, potential, and competitiveness. In the development of sustainable tourism, management must maintain the performance of the tourism industry through management innovation and technological innovation, including a high level of satisfaction with tourists' needs, guaranteeing a significant experience for consumers, increasing their awareness of sustainable issues, and propagating sustainable tourism practices among them [49], [69]. The performance of the tourism industry influences the achievement sustainable tourism industry [70]. Good performance in industry or small companies in the tourism sector can significantly contribute to sustainable tourism development. Strong economic, social, and environmental performance can support efforts to increase the sustainability of the tourism industry [70]. Sustainable economic growth is one of the important aspects affected by the performance of the tourism industry [69]. A successful tourism industry can create jobs, increase income, and encourage the development of infrastructure that supports tourism. Based on the literature compiled regarding tourism industry performance, it can be formulated as follows:

H6: Tourism industry performance have positive influence on the sustainable tourism industry significantly.

III. RESEARCH METHODOLOGY

In this study, a model was developed to examine the effect of open innovation, stakeholders, and support system facilities on tourism industry performance-oriented toward the sustainability of the tourism industry. Factors that can affect the tourism industry's performance are open innovation, stakeholders, and support system facilities. Meanwhile, environmental dynamism and environmental competitiveness variables moderate the strengthening of relations between stakeholders on tourism industry performance. Achieving sustainability goals in the tourism industry can provide balanced benefits for the environment, society, and economy. Based on this explanation, Figure 1 displays the results of elaborating the research model used in this study.

A. SAMPLE AND DATA COLLECTION

Data was collected through a questionnaire survey on SMEs located around tourist areas in Rembang Regency, Central Java, Indonesia, and Banyuwangi Regency, East Java, Indonesia. The characteristics of each tourism object in the area are similar because of geographical similarities. The two areas have similar types of tourist attractions or have the same themes, such as mountains, lowlands, national parks, and beaches. They are located along the coast, so the amount of data is a single entity and does not describe differences in the characteristics of the location of the research object. The selection of two regions with similar attractiveness makes

it possible to provide an effective development strategy for the tourism industry. The population in this study are SMEs located around tourist areas. SMEs were chosen as a sample of respondents because tourism industry activities and the provision of tourism products and services are supported by SMEs [13]. Sampling in this study used a purposive sampling method, in which researchers chose samples based on predetermined characteristics. Researchers deliberately choose the sample unit that is considered the most relevant and representative. The characteristics of the SME respondents were selected based on their location, number of employees, and the type of SMEs. Determining the appropriate respondent characteristics in this study, with a sample of SMEs around tourist areas, can produce accurate and reliable results in understanding the conditions of the tourism industry [71].

Data collection in this study was carried out in two stages. In the first stage, conduct a pilot study to test the validity and reliability of the measuring instrument by distributing questionnaires to academic experts in tourism, SME coordinators, and tourism coordinators in Rembang Regency. The SMEs Coordinator is responsible for leading and managing the SMEs unit. The SMEs coordinator assists, supports, and develops SME businesses [13]. Meanwhile, the tourism coordinator is the person responsible for directing and managing tourism activities in a region [13]. Based on the responses to the questionnaire obtained in the pilot study, some minor improvements were made so that the respondents could truly understand the intent of the questions. Questionnaire responses obtained in the pilot study were not included in the study's final sample.

In the second stage, questionnaires were distributed from April 2022 to February 2023. In this study, the data collection technique used was purposive sampling, which aims to obtain a sample that can describe the population [71]. The population in this study were SMEs located around the tourist area of Rembang Regency, Central Java, and Banyuwangi Regency, East Java. The number of samples taken from the population is ten times the number of variables used in the analysis design and is at least 190 samples [71], [72]. The final total number of respondents obtained was 358 out of 376 respondents, so the respondent rate was 95.21% which is valid for data processing. Figure 2, Table 1, and Table 2 show the distribution of questionnaires to 358 valid respondents, with details of 203 respondents from SMEs in Rembang Regency, Central Java, and 155 respondents from SMEs in Banyuwangi Regency, East Java.

These SMEs represent several creative tourism economic industries in Indonesia [73], [74] located around the industrial tourism area of Rembang Regency, Central Java, and Banyuwangi Regency, East Java. Guidance and assistance were carried out in filling out the questionnaires by the respondents so that most could be filled in completely. However, the respondent still has the authority and full awareness to fill out the questionnaire by the actual conditions without any influence from the researcher.
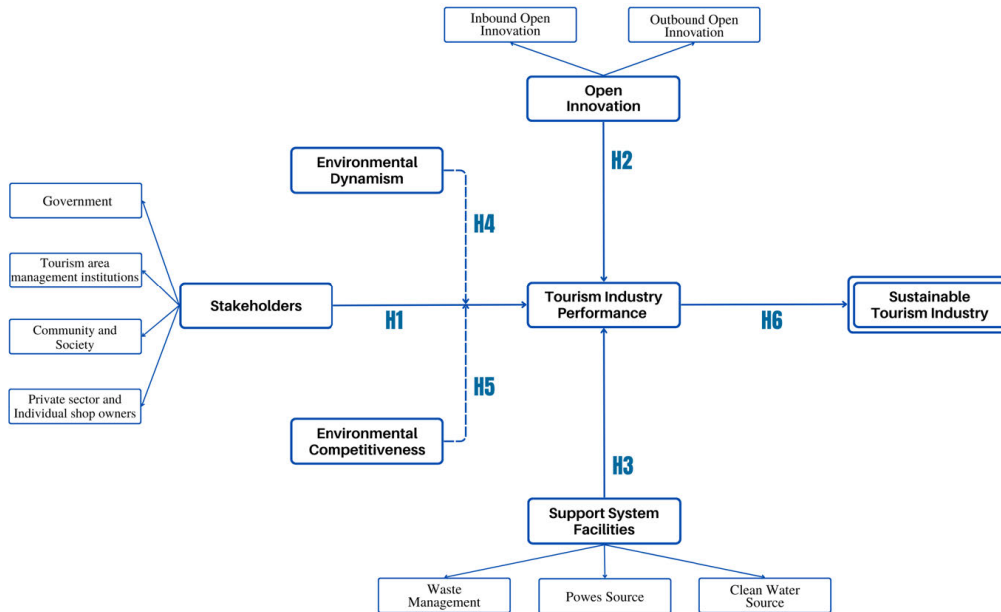
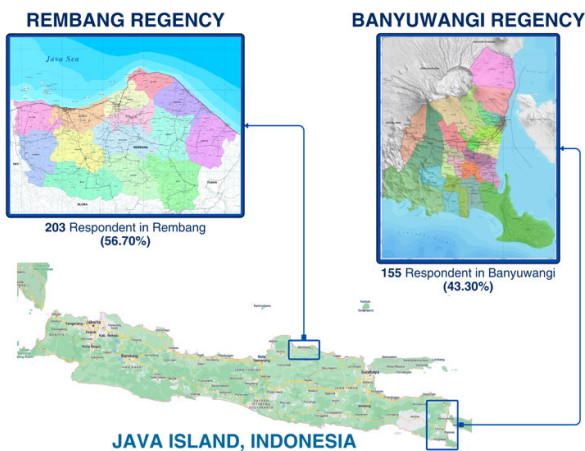**FIGURE 1.** Conceptual research model.

FIGURE 2. Distribution of valid respondents final results.

B. MEASUREMENT OF VARIABLES

The data used in this study are the results of distributing and filling out qualitative questionnaires. This study uses constructs derived from previous empirical studies and literature studies to fulfill the objective of ensuring content validity. The questionnaire consists of two parts. The first part has several open-ended and multiple-choice questions regarding the SME profile, such as the leader's name, respondent's age, location, type of SME, number of employees, and product sales area. The second part contains measurement indicators using a Likert scale of 6 points or an even number. The level of the perceptive scale starts from point 1, indicating the meaning of ''strongly disagree,'' to point 6, indicating the meaning of ''strongly agree.'' A Likert point scale of 6 (even) aims to avoid biased answers with neutral categories and eliminates inadequate words in instrument administration [71], [72]. Measurement indicators for each construct are described in Appendix A.

TABLE 1. Types of SMEs in Rembang Regency, Central Java.

Type of SMEs	Frequency	(%)
SMEs Food beverage	59	29.06%
SMEs Transportation accommodation	33	16.26%
SMEs Art and performing	21	10.34%
SMEs Market for antique	4	1.98%
SMEs Fashion clothing	43	21.18%
SMEs Craft	43	21.18%
Total	**203**	**100%**

TABLE 2. Types of SMEs in Banyuwangi Regency, East java.

Type of SMEs	Frequency	(%)
SMEs Food beverage	47	30.32%
SMEs Transportation accommodation	26	16.77%
SMEs Art and performing	14	9.03%
SMEs Market for antique	9	5.81%
SMEs Fashion clothing	35	22.58%
SMEs Craft	24	15.48%
Total	**155**	**100%**

C. OPERATIONAL OF CONSTRUCT

The independent variables are the independent variables of open innovation, stakeholders, support system facilities, environmental dynamism, and environmental competitiveness. At the same time, the tourism industry performance and the sustainable tourism industry are the dependent variables in this study.

1) INDEPENDENT VARIABLE

The independent variables in this study consist of Open Innovation (OI), Stakeholders (SH), and Support System Facilities (SSF). Some moderating variables include independent variables, namely Environmental Dynamism (ED) and

Environmental Competitiveness (EC). The open innovation variable reflects indicators of Inbound Open Innovation (IOI) and Outbound Open Innovation (OOI) [19], [20], [21], [22]. The Stakeholders variable reflects indicators of Government (GOV), Tourism Area Management Institutions (TAM), Community and Society (CS), Private Sector and Individual Shop Owners (PIO) [13], [24], [25], [40]. Meanwhile, the support system facilities variable reflects indicators of Power Sources (PS), Waste Management (WM), and Clean Water Sources (CW) [13], [23], [26]. Meanwhile, the environmental dynamism and environmental competitiveness variables moderate the strengthening of the relationship between stakeholders on tourism industry performance which is translated into 12 question items built based on factors of politics, economics, society, technology, law, and the environment [52], [57].

According to Hair et al. [75], reflective indicators can be seen as a representative sample of all items available in the model construct (Mode A measurement in PLS-SEM). Therefore, reflective measures determine that all indicators are correlated and come from the same domain. In addition, each indicator can be exchanged for other indicators, and every single indicator can be omitted without changing the meaning of the construct as long as the construct has sufficient reliability [75].

2) DEPENDENT VARIABLE

The dependent variables in this study include the tourism industry's performance and the sustainable tourism industry. The dependent Tourism Industry Performance (TIP) variable is measured by 10 statement items related to financial and operational performance [13], [68]. At the same time, 12 statement items measure the measurement of Sustainable Tourism Industry (STI) variables. SMEs that innovate, fulfill support system facilities, and collaborate with stakeholders have different performance measures. Tourism industry performance as a result of a measurement process through open innovation, stakeholders, and support system facilities will lead to a sustainable tourism industry [49], [57].

D. DATA ANALYSIS

This study uses a structural equation model (SEM), a combination of a structural model and a measurement model, which includes latent variables and indicators for all relevant relationships [71], [76]. PLS-SEM is used for data processing and evaluating model testing. There are four reasons for using this technique. First and foremost, PLS-SEM is a powerful and useful technique for estimating complex models that contain many constructs and indicators. Second, PLS-SEM is not affected by small sample sizes because this test technique analyzes one construct at a time by applying iterative ordinary least squares ordering and multiple linear regression. Third, because it works with parametric tests, thus solving the possibility of data abnormality problems and fourth, PLS-PM

is suitable for testing the relationship between variables for research that is still in the exploratory stage, advanced stage, or a combination of both [71], [77].

Model testing uses data from 358 SMEs from respondents spread across the Rembang Regency, Central Java, Indonesia, and Banyuwangi Regency, East Java, Indonesia. The SMEs operate in six sectors of the creative economy, namely food and beverage SMEs, crafts, transportation, lodging, clothing, antique market, and performing arts. In this study, SMEs as respondents were said to have the same characteristics because this type of SME became a unit in supporting tourism industry activities in Rembang Regency, Central Java, and Banyuwangi Regency, East Java. Therefore, data from several SME types are processed simultaneously as one population. If using a ratio of 10:1, the minimum sample has been fulfilled in this study [71].

Using PLS-SEM as a statistical tool, model testing in this study consisted of two steps: the measurement model and the structural model. Testing the measurement model ensures that the analytical instrument is reliable and valid. Meanwhile, structural model testing was carried out to examine the relationship between the dependent and independent variables [71], [78]. The criteria tested in the measurement model are reliability (Composite Reliability and Cronbach Alpha), validity (Average Variance Extracted), and discriminant validity. In reliability analysis, the measurement model for composite reliability must have a value above 0.7, and Cronbach's alpha must be more than 0.6 [71], [78]. A variable is considered to have good validity (AVE) if it has an AVE value of more than 0.5 [71], [78]. Meanwhile, the Fornel-Larcker Criterion value for each construct must be greater than the highest squared correlation value with the other constructs [71]. Another criterion for assessing discriminant validity is through the cross-loading matrix. If an indicator correlates more with other latent variables than the variable it measures, then the model's suitability must be reconsidered because it shows poor indicator validity [71], [78]. Figure 3 shows the structural model relationship between the dependent and independent variables in the PLS-SEM software.

IV. RESULT

This study identifies the influence of open innovation, stakeholders, and support system facilities on tourism industry performance which is oriented toward the sustainability of the tourism industry. Therefore, this study will analyze how these factors impact the performance of the sustainable tourism industry. The recommended approaches for analyzing the relationship between these variables are measurement and structural model analysis [71], [78]. This study will collect respondent data using a questionnaire as a data collection tool. Respondents in this study were SMEs as tourism industry players in Rembang Regency, Central Java, Indonesia, and Banyuwangi Regency, East Java, Indonesia, which are related to tourism sustainability.
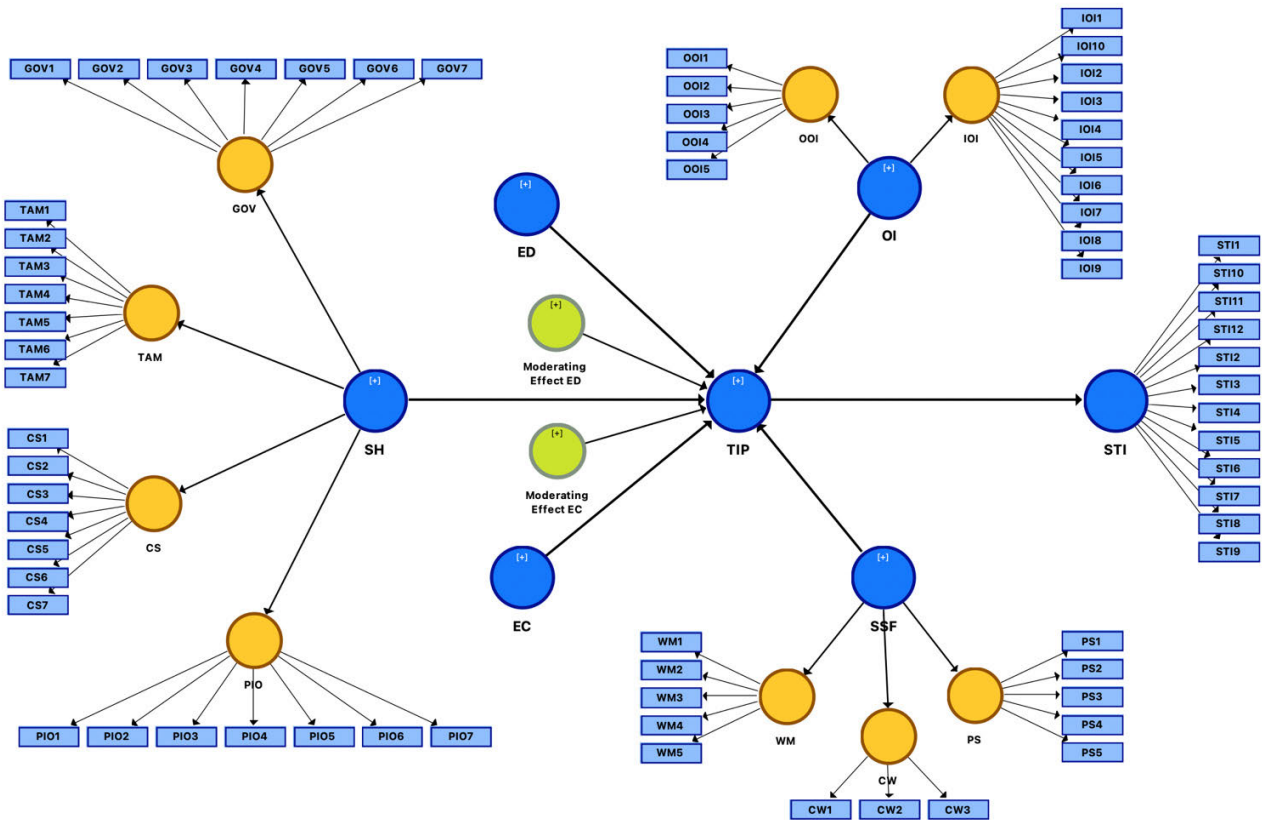
FIGURE 3. Structural model relations in PLS-SEM software.

A. PROFILE OF RESPONDENT

Respondents to the questionnaire survey were 358 SMEs that form a single unit in supporting tourism industry activities in Rembang Regency, Central Java, and Banyuwangi Regency, East Java. Respondents from the two objects have the same and similar characteristics in terms of geography and the area located on the coast. Therefore the data obtained is a single unit and does not describe differences in the character of the location of the research object [38], [79]. The results of collecting SME respondent data will be combined and processed simultaneously using the PLS-SEM software. A brief description of the valid SME respondents is explained in Table 3.

Based on Table 3, 203 SMEs (56.70%) samples were obtained from the Rembang Regency area, and 155 SMEs (43.30%) were taken from the Banyuwangi Regency area. The respondents were SMEs engaged in the creative industry to support tourism industry activities. The majority of the sample SMEs who were respondents had been operating for 10-20 years (39.66%) and 1-10 years (21.23)% with male sex (88.55%).

Based on the age of the respondents, the largest age group was 83 respondents (23.18%) in the $\geq$ 40 years category, followed by 72 respondents (20.11%) in the 31 - 35 years category, and there were 69 respondents (19.27%) in the 26 - 30 years category. Based on the total number of workers, 142 respondents dominated the SME category with a total

TABLE 3. Profile of respondents.

Measure	Category	Frequency	(%)
Region	Rembang Regency	203	56.70
	Banyuwangi Regency	155	43.30
Gender	Male	317	88.55
	Female	41	11.45
Age of SMEs	1 - 10 years	76	21.23
	11 - 20 years	142	39.66
	21 - 30 years	66	18.44
	31 - 40 years	45	12.57
	$\geq$40 years	29	8.10
Respondent's Age	< 20 years	12	3.35
	20 - 25 years	58	16.20
	26 - 30 years	69	19.27
	31 - 35 years	72	20.11
	36 - 40 years	64	17.88
	$\geq$40 years	83	23.18
Number of Worker	< 5 workers	33	9.22
	6 - 10 workers	48	13.41
	11 - 15 workers	86	24.02
	16 - 20 workers	142	39.66
	21 - 25 workers	31	8.66
	$\geq$ 25 workers	18	5.03
Total Asset (Million Rupiah)	<1000	246	68.72
	$\geq$1000	112	31.28

of 16-20 workers (39.66%), followed by 86 respondents in the SME category with a total of 11-15 workers (24.02%) and followed by 48 respondents in the SME category with a total 6-10 workers (13.41%). Based on the number of workers, it can be concluded that micro industries (1-5 work-

ers) are 33 industries, small industries (6-20 workers) are 276 industries, and medium industries (21-99 workers) are 49 industries. Meanwhile, in terms of total assets, 246 SMEs (68.72%) had assets of < 1000 million rupiah, and 112 SMEs (31.28%) had assets of ≥ 1000 million rupiah.

B. MEASUREMENT MODEL

The first step is assessing the measurement model results for each construct and its indicators. The measurement model is a model that represents the relationship between indicators and their constructs [71]. In addition, the purpose of the measurement model is to measure and validate the constructs used in research [71]. Measurement models operationalize abstract constructs into measurement variables that can be measured empirically. This step is intended to assess the validity and reliability of the indicators that measure constructs in the research model [71]. The measurement model is tested by evaluating internal consistency (Cronbach's alpha and composite reliability), which aims to measure internal consistency reliability. Indicator reliability (outer loading) aims to measure the validity of each indicator, convergent validity to evaluate convergent validity, and discriminant validity to evaluate discriminant validity.

Several criteria must be met in testing a measurement model with reflective properties [71], namely Cronbach's alpha value of more than 0.6 and composite reliability of more than 0.7 [71], [78]. The validity of the measurement model is based on the average variance extract (AVE) value and discriminant validity, where the AVE value must be more than 0.5 for each variable [71], [78]. The outer loading value is based on an indicator with a value equal to or greater than 0.7. Indicators with an outer loading value of less than 0.4 need to be removed from the measuring instrument. Meanwhile, the outer loading value between 0.4 and 0.7 must be considered removed from the measuring instrument if it can increase the value of composite reliability or AVE [71], [78]. Moreover, the value of the Fornell-Lacker criteria for each variable must be greater than the correlation of this variable with other variables [71], [78].

This study shows that Cronbach's alpha value for sixteen constructs is more than 0.6, and the composite reliability value is more than 0.7, which indicates that the internal consistency of the measurement model in this study is good [71], [78]. The evaluation results show that the outer loading values of all indicators meet the requirements because there is no value less than 0.4, indicating that the measurement has reliability, consistency, and validity [71], [78]. Based on the AVE value for sixteen constructs is greater than 0.5, which indicates that the criteria have been met [71], [78]. The results of the measurement model assessment related to Cronbach's alpha, composite reliability, and AVE values are presented in Table 4. The Fornell-Lacker value of each construct variable fulfills the highest value in each construct tested with other constructs, meaning each indicator can be predicted well by each construct variable. Even though there are indicator values with a smaller correlation than the values

of the constructed variables in Fornell-Lacker, this can be ignored if both are relationships between the constructed variables and their dimensions as shown in Table 5 [71], [78]. Thus, from a convergence and discriminant perspective, this measurement model can be considered reliable and valid. Thus, this measurement model can be considered reliable and valid from a convergence and discriminant perspective because it meets the criteria for measurement conditions recommended by experts [71], [78].

C. STRUCTURAL MODEL

Structural model testing and analysis are carried out after the built measurement model stage meets valid and reliable criteria. In measuring the structural model, the collinearity value (VIF), the significance of the structural model relationship, the value of the coefficient of determination (R^2), and the effect size f^2 [71], [78]. The structural model examines the relationship between the independent variables, namely open innovation, stakeholders, and support system facilities, and two moderating variables, namely environment dynamism and environment competitiveness, on the dependent variable, namely tourism industry performance and sustainable tourism industry. Collinearity analysis was carried out through the Variance Inflation Factor (VIF) value. VIF is a factor that measures how much the variance of the regression estimator coefficient increases compared to the orthogonal independent variables when connected linearly. VIF values above 3.00 in the predictor construct indicate collinearity [71]. The collinearity results show that the VIF value is less than 3, so it does not show collinearity as presented in Table 6.

Then the significant value in the structural model relationship is analyzed based on the value of the path coefficient and T-Statistic [71]. The Bias Correct and Accelerated Bootstrap and the two-tailed test type were selected. The significance level was set at 0.05. As shown in Table 7, all path coefficients of each variable in the structural model are significant (p ≤ 0.05), except for the competitiveness environment variable (p ≥ 0.05) as a moderating variable.

Based on the results of the structural test, it is known that hypothesis 1, namely stakeholders, has a positive and significant effect on tourism industry performance ($\beta = 0.768$; p = 0.000, p ≤ 0.05). Hypothesis 2 is that open innovation positively and significantly affects tourism industry performance ($\beta = 0.601$; p = 0.000, p ≤ 0.05). Hypothesis 3 is that support system facilities positively and significantly affect tourism industry performance ($\beta = 0.452$; p = 0.046, p ≤ 0.05). Hypothesis 4, namely environmental dynamism, has a positive and significant effect on tourism industry performance ($\beta = 0.648$; p = 0.000, p ≤ 0.05). Hypothesis 5, namely environmental competitiveness, cannot be proven and is not significant to tourism industry performance ($\beta = 0.022$; p = 0.120, p ≥ 0.05). Hypothesis 6, namely tourism industry performance, has a positive and significant effect on the sustainable tourism industry ($\beta = 0.530$; p = 0.005, p ≤ 0.05). This shows that H1, H2, H3, H4, H6 are proven and

TABLE 4. Measurement model assessment.

Measuring Instrument	Cronbach's Alpha	rho_A	CR	AVE
Sustainable Tourism Industry (STI)	0.714	0.932	0.810	0.666
Tourism Industry Performance (TIP)	0.891	0.914	0.922	0.684
Open Innovation (OI)	0.882	0.961	0.939	0.781
Inbound Open Innovation (IOI)	0.876	0.912	0.961	0.843
Outbound Open Innovation (OOI)	0.962	0.954	0.968	0.922
Support System Facilities (SSF)	0.888	0.841	0.888	0.631
Power Source (PS)	0.729	0.819	0.838	0.651
Waste Management (WM)	0.792	0.808	0.877	0.619
Clean Water Source (CW)	0.707	0.844	0.884	0.722
Stakeholders (SH)	0.816	0.851	0.851	0.789
Government (GOV)	0.677	0.700	0.798	0.730
Tourism Area Management Institution (TAM)	0.891	0.786	0.867	0.784
Community and Society (CS)	0.842	0.790	0.860	0.721
Private Sector and Individual Shop Owners (PIO)	0.783	0.891	0.833	0.706
Environment Dynamism (ED)	0.824	0.733	0.706	0.760
Environmental Competitiveness (EC)	0.702	0.762	0.734	0.598

TABLE 5. Fornell-Lacker correlations between constructs.

	CS	CW	EC	ED	GOV	IOI	OI	OOI	PIO	PS	SH	SSF	STI	TAM	TIP	WM
CS	0.817															
CW	0.371	0.788														
EC	0.083	-0.003	0.812													
ED	0.213	0.035	0.166	0.743												
GOV	0.421	0.354	0.168	0.137	0.816											
IOI	0.388	0.125	0.171	0.295	0.377	0.923										
OI	0.166	-0.110	0.349	0.110	0.233	0.311	0.890									
OOI	0.148	-0.132	0.355	0.142	0.218	0.303	0.991	0.960								
PIO	0.496	0.143	0.280	0.287	0.270	0.457	0.543	0.520	0.825							
PS	0.272	0.478	-0.161	-0.046	0.223	0.119	-0.010	-0.243	0.053	0.808						
SH	0.624	0.268	0.211	0.173	0.222	0.476	0.054	0.420	0.815	0.257	0.834					
SSF	0.280	0.870	-0.169	-0.039	0.155	0.018	-0.301	-0.324	0.013	0.690	0.169	0.748				
STI	-0.005	-0.081	-0.046	0.036	0.015	-0.093	0.134	0.328	0.117	-0.134	0.066	-0.140	0.722			
TAM	0.472	0.224	0.160	0.092	0.330	0.414	0.316	0.288	0.521	0.280	0.822	0.170	-0.017	0.814		
TIP	0.279	-0.033	0.292	0.544	0.179	0.406	0.465	0.474	0.558	-0.084	0.459	-0.129	0.094	0.331	0.876	
WM	0.183	0.666	-0.243	-0.041	0.040	-0.053	-0.371	-0.387	0.224	0.503	0.021	0.856	-0.126	0.019	-0.152	0.704

TABLE 6. VIF value and multicollinearity.

Relationship	VIF	Conclusion
SH → TIP	1.803	No collinearity
OI → TIP	1.655	No collinearity
SSF → TIP	1.421	No collinearity
ED → TIP	1.000	No collinearity
EC → TIP	1.131	No collinearity
TIP → STI	1.000	No collinearity
SH → GOV	1.000	No collinearity
SH → TAM	1.000	No collinearity
SH → CS	1.000	No collinearity
SH → PIO	1.000	No collinearity
OI → IOI	1.000	No collinearity
OI → OOI	1.000	No collinearity
SSF → WM	1.000	No collinearity
SSF → PS	1.000	No collinearity
SSF → CW	1.000	No collinearity

TABLE 7. Significance of structure relationship.

Hypothesis		Path Coefficient	T Statistics	P Values	Conclusion
H1	SH → TIP	0.768	8.681	0.000	Accept
H2	OI → TIP	0.601	9.309	0.000	Accept
H3	SSF → TIP	0.452	7.024	0.046	Accept
H4	ED → TIP	0.648	11.220	0.000	Accept
H5	EC → TIP	0.022	1.306	0.120	Reject
H6	TIP → STI	0.530	5.749	0.005	Accept

TABLE 8. Significance for stakeholders with its dimension.

Relationship	Correlation Value	T Statistics	P Values	Conclusion
SH → GOV	0.421	12.098	0.000	Significant
SH → TAM	0.760	38.223	0.000	Significant
SH → CS	0.562	25.009	0.000	Significant
SH → PIO	0.796	39.117	0.000	Significant

have a significant relationship. In contrast, H5 is rejected and insignificant in the sustainable tourism industry in Rembang and Banyuwangi Regency. The results of the structural model are summarized in Table 7.

Furthermore, the significance value in the structural model relationship for each dimension of the stakeholders, open

innovation, and support system facilities variables will be presented as independent variables shown in Table 8, Table 9, and Table 10.

The significant value of each variable shows that each dimension of the SH, OI, and SSF variables have a significant relationship, meaning that these variables are appropri-

TABLE 9. Significance for open innovation with its dimension.

Relationship	Correlation Value	T Statistics	P Values	Conclusion
OI → IOI	0.424	8.714	0.000	Significant
OI → OOI	0.893	187.297	0.000	Significant

TABLE 10. Significance for support system facilities with its dimension.

Relationship	Correlation Value	T Statistics	P Values	Conclusion
SSF → CW	0.823	38.009	0.000	Significant
SSF → PS	0.705	18.225	0.000	Significant
SSF → WM	0.918	79.297	0.000	Significant

ate when measured by their dimensions [71]. The variable dimensions of SH, OI, and SSF are built reflectively because the indicator items come from the same domain and are correlated with each other. In addition, each indicator can be exchanged with other indicators, and every single indicator can be removed without changing the nature of the model that has been built [75].

In testing the structural model, the value of the coefficient of determination (R^2) is analyzed to determine the significance and relationship of each constructed path to dimensions [71]. The R^2 value and path coefficient show how well the data support the hypothesized model [71]. The R^2 value above 0.5 indicates that the dimensions are correlated and can explain the construct well [71]. Based on the correlation coefficient value, the stakeholder variable is proven to have a good correlation with the constituent dimensions consisting of government ($R^2 = 0.572$), tourism area management institutions ($R^2 = 0.723$), community and society ($R^2 = 0.447$) and private sector and individual shop owners ($R^2 = 0.704$). The open innovation variable is proven to have a reasonable correlation with its constituent dimensions, which consist of inbound open innovation ($R^2 = 0.541$) and outbound open innovation ($R^2 = 0.951$). Meanwhile, the support system facilities variable proved to have a reasonable correlation with its constituent dimensions consisting of waste management ($R^2 = 0.862$), power sources ($R^2 = 0.555$), and clean water sources ($R^2 = 0.689$). The tourism industry performance variable is proven to have a reasonable correlation with an R^2 value of 0.653 for the sustainable tourism industry variable with an R^2 value of 0.519. In this case, around 65.3% of the variation in the sustainable tourism industry variable can be explained by the tourism industry performance variable. Meanwhile, around 51.9% of the variation in the STI variable can be explained by OI, SH, SSF, ED and EC, which can be seen in Table 11.

From some of the analysis results described earlier, Figure 4 describes the structural relationships in the research model, which describes all hypotheses that have a significant relationship with the dependent and independent variables.

The research model shown in Figure 4 was created by proving the hypothesis in this study. A red dashed line indicates that the variable has no significant effect on the model, and a black line indicates a significant relationship between the variables in the model.

TABLE 11. Significance of structure relationship.

Construct	Dimension	R^2	R^2 Adjusted
SH	Government	0.572	0.569
	Tourism Area Management Institution	0.723	0.720
	Community and Society	0.447	0.445
	Private Sector Individual Shop Owner	0.704	0.702
OI	Inbound Open Innovation	0.541	0.540
	Outbound Open Innovation	0.951	0.948
	Waste Management	0.862	0.861
SSF	Power Source	0.555	0.553
	Clean Water Source	0.689	0.687
TIP	Tourism Industry Performance	0.653	0.644
STI	Sustainable Tourism Industry	0.519	0.543

TABLE 12. f^2 value.

Construct	f^2
SH → TIP	0.219
OI → TIP	0.108
SSF → TIP	0.178
ED → TIP	0.389
EC → TIP	0.111
TIP → STI	0.134

In addition, it is also important to analyze the magnitude of the influence between variables through the effect size or f^2 value. The f^2 value of 0.02 indicates that the effect size value is low. Values between 0.02 and 0.15 have a moderate effect size, while a minimum value of 0.35 has a high effect size. According to Hair et al. [71], an f^2 value of less than 0.02 can be ignored or considered as having no impact. In Table 12, the f^2 value in this study is explained.

V. DISCUSSION

This research focuses on identifying the integration of the roles of stakeholders, open innovation, and support system facilities to improve the performance of the tourism industry from an environmental, economic, and social perspective and encourage sustainable tourism industry development. In addition, environmental effects in achieving optimal performance, such as environmental dynamism and environmental competitiveness, are also considered.

The tourism industry is a sector that contributes to increasing income and employment in Indonesia [80], [81], [82], especially in Rembang Regency, Central Java, Indonesia and Banyuwangi Regency, West Java, Indonesia [13], [83]. The two regions were chosen as research objects because they have a lot of tourism potential to support tourism industry activities, such as nature tourism, cultural tourism, artificial tourism, culinary tourism, and religious tourism [13], [83]. The selection of sampling used in measuring a sustainable tourism industry is by using a purposive sampling technique, with the criteria of SMEs scattered around tourist areas, so that a sample of 358 SMEs is obtained. SMEs have an important role in tourism industry activities [13], [84]. With the right support, SMEs can help increase tourist attractiveness and regional income and strengthen local culture [84].
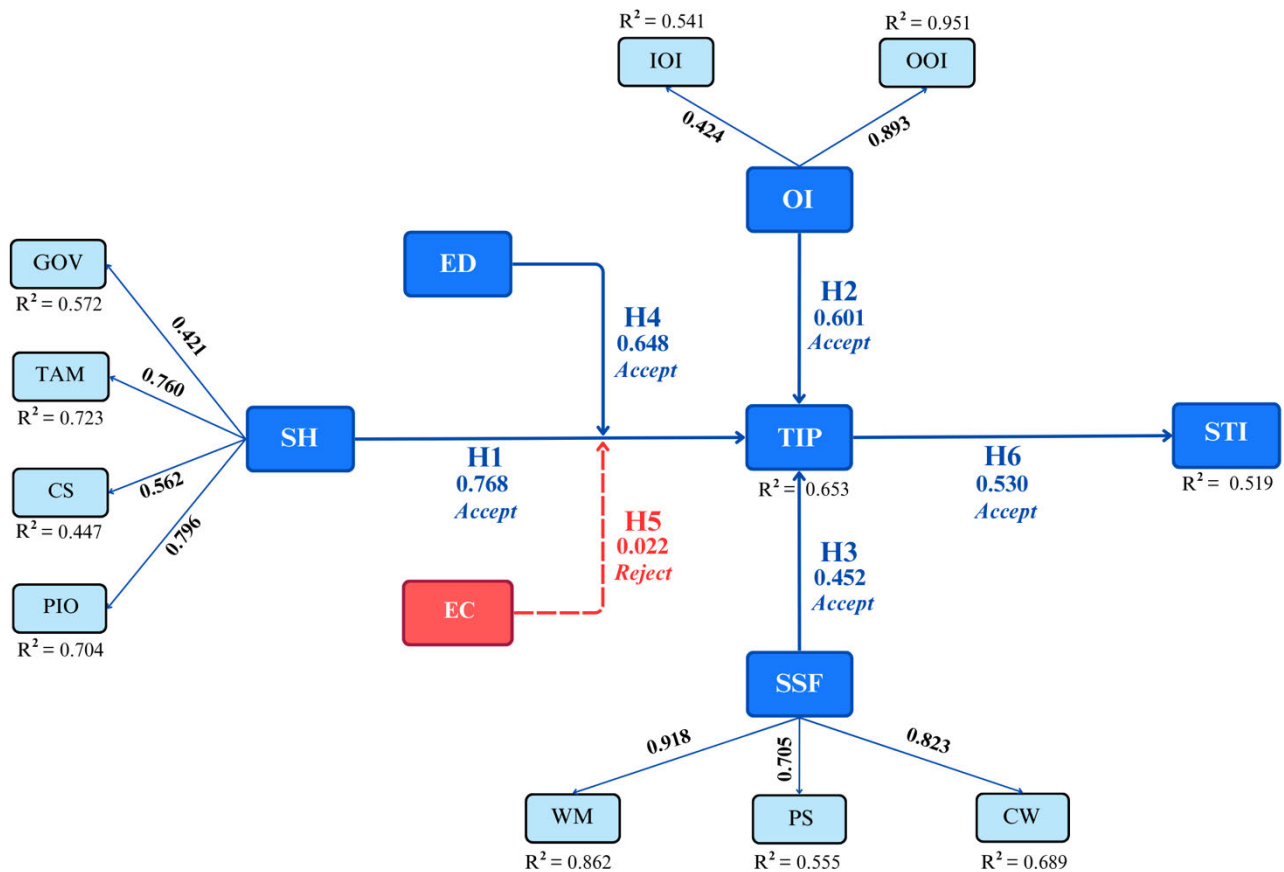
FIGURE 4. Structural model relationship.

In addition, SMEs can help improve service quality and develop creativity and innovation in the tourism industry [85]. The development of the tourism industry is a priority for most countries because of the benefits it generates for society, starting from an economic, environmental, and social welfare perspective [86], [87].

The results of research conducted in the context of the tourism industry in Indonesia show that increasing tourism industry performance can positively assist in achieving a sustainable tourism industry. This is in line with previous research from [88] and [89], which shows that the tourism industry's performance plays an important role in increasing sustainable tourism. Tourism industry performance can be achieved through four variables, namely the role of stakeholders, open innovation, support system facilities, and environmental dynamism. In contrast, the environmental competitiveness variable is rejected and is not proven to affect tourism industry performance.

The influence of the role of stakeholders in increasing the sustainable tourism industry is very important, so hypothesis 1 in this study is proposed. The analysis results show that stakeholders have a high significant value on the tourism industry's performance ($\beta = 0.768$; $p = 0.000$, $p \leq 0.05$). Thus, the role of stakeholders is highly considered in the tourism industry development pro-

cess [13], [25], [60]. Stakeholders involved in improving the tourism industry in Rembang Regency, Central Java, Indonesia, and Banyuwangi Regency, East Java, Indonesia, contributed significantly. The approach systematically taken by stakeholders will then help organizations in the tourism industry to increase their sustainability [25]. According to Habibullah et al. [90], they were stated that the sustainability of the tourism industry is very important to maintain the environment and local culture and ensure long-term business continuity. The government's role in Rembang Regency, Central Java, and Banyuwangi Regency, East Java, is important in creating regulations and policies that support a sustainable tourism industry [83]. This includes management of natural resources and the environment, licensing regulations, supervision and law enforcement, and infrastructure development [13]. In addition, NGOs and environmental organizations can monitor the social and environmental impacts of the tourism industry and provide recommendations and support to the government and tourism businesses to promote sustainable practices [25]. Entrepreneurs and tourism business actors must promote tourism products that are environmentally friendly and sustainable and minimize negative impacts on the environment and local culture. Local communities also need to be involved in developing sustainable tourism products and preserving local culture and environ-

ment [26], [83]. With good collaboration and cooperation between different stakeholders, the tourism industry can operate sustainably and provide positive economic, social, and environmental benefits to the community and the surrounding environment [25].

In addition, open innovation proposed as hypothesis 2, plays a crucial role in achieving optimal performance and industry sustainability [22], [38]. The results of the structural model test in this study show that open innovation and tourism industry performance have a statistically significant relationship ($\beta = 0.601$; p = 0.000, p $\leq$ 0.05). Therefore, in the tourism industry, open innovation can help create new solutions to overcome challenges and problems related to environmental, social, and cultural sustainability [20]. These results are in line with research [30], which states that innovation can help SMEs and organizations create more attractive and sustainable tourism products, thereby strengthening the competitiveness of the tourism industry in an increasingly tight global market [29], [91]. In addition, open innovation can also help create new opportunities for sustainable business development and strengthen the competitiveness of the tourism industry in a constantly changing market environment. Open innovation can also help overcome challenges in developing sustainable tourism products, such as minimizing negative environmental and local cultural impacts [92]. Therefore, the government, business actors, tourism area management institutions, communities, and communities need to participate in open innovation collaborations to create innovative solutions that can improve the performance and sustainability of the tourism industry as a whole [93], [94], [95].

In the context of support system facilities, the research results show that support system facilities have a positive and significant effect on tourism industry performance ($\beta = 0.452$; p = 0.046, p $\leq$ 0.05), so hypothesis 3 proposed in this study is supported. Support system facilities that can assist in achieving sustainability in the tourism industry consist of waste management, clean water sources, and power sources [13]. This facility also helps create a positive and sustainable tourism experience for tourists in the Rembang and Banyuwangi Regencies, which can strengthen the competitiveness of the tourism industry in a dynamic market environment. In addition, support system facilities can also help reduce the negative impact of the tourism industry on the environment by creating new technologies and methods that are more efficient and environmentally friendly [23]. Therefore, the government and business actors in the tourism industry need to work together to improve the facilities supporting this system by investing in new infrastructure or improving the quality of existing facilities. In the long term, improving the quality and availability of support system facilities will help improve the performance and sustainability of the tourism industry [96].

In the context of the environment in the tourism industry, SMEs operating around tourist areas have an important role in achieving optimal performance and sustainability. In this study, the role of environmental dynamism strengthens the positive influence of stakeholders on the performance of the tourism industry ($\beta = 0.648$; p = 0.000, p $\leq$ 0.05). Hypothesis 4 proves that environmental dynamism affects the ability of SMEs to adapt to fast and unexpected environmental changes [19], [22], [52]. The tourism industry in Rembang Regency, Central Java, and Banyuwangi Regency, Indonesia, is vulnerable to changes in environmental factors such as climate change, government policies, and higher consumer expectations that can affect the performance of SMEs in the short and long term [13]. Therefore, SMEs in the tourism industry must have the ability to adapt to a changing environment and maintain strong competitiveness in the long term. However, in this study hypothesis 5 was not proven to be significant, namely the relationship between environmental competitiveness as a moderator to strengthen the influence between stakeholders and tourism industry performance ($\beta = 0.022$; p = 0.120, p $\geq$ 0.05). The environmental competitiveness hypothesis can be rejected because in some cases, SMEs around tourist areas can work together to carry out their operations, benefiting all these SMEs. For example, SMEs can share resources, such as raw materials and labor, reducing production costs and increasing efficiency. In cases like this, efforts to improve environmental competitiveness may not be the most important factor influencing tourism industry performance. This is because cooperation between these IKMs can help reduce production costs and increase efficiency, which in turn can improve the tourism industry's performance. The study's results Popa et al. [22] also suggest that statistically environmental competitiveness is not proven to reinforce the relationship between stakeholders and organizational performance. Moderator environmental competitiveness is related to the ability of SMEs organizations to produce products or services at an efficient cost and low prices [19]. In this study, the SMEs in Rembang Regency, Central Java dan Banyuwangi Regency, East Java that are the object of research have not been able to carry out production cost efficiency due to the availability of supplier raw materials that are used jointly, the use of sales points or showrooms used jointly in the tourism industry centers, joint activities between SMEs and stakeholders in determining new services and products that characterize the location, and the strong nature of togetherness between owners and leaders in SMEs to support tourism industry activities. This causes competition in general to not occur in SMEs around tourist areas. Mutual dependence in fulfilling this is one of the factors that cause environmental competitiveness not to be proven as a strengthening of the relationship between stakeholders and the performance of the tourism industry in this study.

Finally, improving the tourism industry's performance can positively impact environmental, social, and economic sustainability ($\beta = 0.530$; p = 0.005, p $\leq$ 0.05). This is in accordance with research by Sobaih et al. [70] regarding the role of performance in the relationship between small hospitality enterprises' resilience and sustainable tourism development. Research by Sobaih et al. [70] shows that company perfor-

mance through planned and adaptive resilience positively and significantly affects sustainable tourism development. Research from Sobaih et al. [70] is an early attempt to explore the direct impact of small hospitality business resilience on sustainable tourism development and the indirect impact of tourism performance. Improving the tourism industry's performance means increasing operational effectiveness and efficiency and fostering sustainable industrial competitiveness. Research from Nadalipour et al. [57] stated that to achieve sustainability is the simultaneous consideration of the performance of all these factors and the performance of all stakeholders involved in a goal. Stakeholder performance is influenced by the attractiveness of destinations, on the one hand, and the attitudes of internal stakeholders towards tourism [57]. The optimal performance of stakeholders in terms of waste management, energy efficiency, cultural protection, and local community participation can positively impact tourism sustainability [57]. In this case, the tourism industry can reduce negative environmental impacts by increasing operational effectiveness and efficiency. For example, tourism can help minimize adverse environmental impacts by reducing energy and water use and better managing waste [97]. In addition, by increasing operational efficiency, the tourism industry can also reduce operational costs, improving business competitiveness and profitability.

VI. CONCLUSION

Based on the research that has been done, it can be concluded that open innovation, stakeholders, and support system facilities have a critical role in achieving the sustainability of the tourism industry. Furthermore, a detailed description of the main findings of this study, as well as contributions and future directions, are provided below.

A. MAIN FINDINGS

This research aims to increase the optimal performance of the tourism industry and encourage sustainable development through open innovation, stakeholder collaboration, and support system facilities ($p < 0.05$). The results of this study indicate that open innovation opens opportunities for new and better innovations in overcoming environmental and social problems in the tourism industry ($\beta = 0.601$; $p = 0.000$, $p \leq 0.05$). This helps create products and services that are more environmentally friendly and sustainable and improves overall business performance. Stakeholders, including the government, tourism management agencies, communities, and local communities, also have an important role in achieving the sustainability of the tourism industry ($\beta = 0.768$; $p = 0.000$, $p \leq 0.05$). Participation and cooperation of all parties help overcome social, economic, and environmental problems in the tourism sector. In this case, creating an environmentally friendly environment and a prosperous society is the main focus in achieving the sustainability of the tourism industry. In addition, good support system facilities are also an important factor in achieving the sustainability of the tourism industry ($\beta = 0.452$; $p = 0.046$, $p \leq$

0.05). Support facilities such as waste management, clean water, power, and infrastructure must support sustainable and environmentally friendly tourism practices. In this case, the government and the private sector need to work together in building infrastructure that supports the sustainability of the tourism industry. However, environmental competitiveness in the tourism industry has not proven to be influential in improving the performance of the tourism industry ($\beta = 0.022$; $p = 0.120$, $p \geq 0.05$), because SMEs and stakeholders around tourist areas prefer to work together and depend on each other to meet the needs of tourists.

Open innovation, stakeholders, and support system facilities are important factors in increasing optimal performance and achieving sustainability in the tourism industry ($\beta = 0.530$; $p = 0.005$, $p \leq 0.05$). The involvement of all parties in the tourism industry and support from the government and the private sector is needed to create a sustainable and environmentally friendly business environment. All parties must cooperate and take responsibility for achieving optimal performance and sustainability goals in the tourism industry that will provide long-term benefits for the environment, society, and the economy.

B. THEORITICAL AND PRACTICAL IMPLICATION

Theoretically this study discusses several theoretical implications. First, this research contributes to enriching the review literature and understanding the factors that influence optimal performance and sustainability of the tourism industry as well as providing new perspectives in terms of open innovation, stakeholders, and support system facilities. In addition, the empirical tools in this study can become a reference for future research in the tourism industry and provide a better understanding of how to achieve sustainability in the tourism industry. Therefore, this research contributes to the field of knowledge in the existing literature on tourism industry performance modeling and tourism sustainability by developing open innovation, stakeholders, support system facilities, and environmental dynamism variables as moderating variables. Second, this study provides theoretical implications that strengthen the understanding of the relationship between open innovation and sustainable tourism industry development. These implications show that open innovation practices, such as collaboration with external parties and sharing knowledge, can accelerate sustainable tourism development. By broadening the knowledge base and engaging diverse stakeholders, tourism can adapt to environmental changes and increase sustainability. Third, because this research examines the context of a dynamic environment, this research emphasizes the importance of involving different stakeholders, including employees, government, community and society, the private sector, and individual shop owners in developing sustainable tourism amidst rapid environmental changes. Tourism can adapt and overcome changing environmental challenges through collaboration and cooperation with stakeholders.

Practically, this research can help SMEs as research objects that support tourism industry activities and stakeholders as strategies and policymakers. For SMEs, this research provides insights to develop sustainable and innovative business practices that can provide long-term benefits for their business and environment. SMEs must consider the importance of stakeholder involvement and cooperation with other parties in the tourism industry and pay attention to infrastructure supporting sustainable business practices. This is also following the results of this study that environmental competitiveness does not affect improving the tourism industry's performance. With lots of cooperation with partners in their operations, SMEs can achieve optimal performance. In addition, SMEs must utilize technology in innovation and waste management. Technology utilization will help SMEs increase production efficiency, reduce waste, and create higher-quality products. Examples of technologies that can be utilized are waste processing machines, more efficient production technologies, and more environmentally friendly raw materials. With the application of this technology, SMEs can achieve optimal performance and sustainable business practices. Sustainable business practices will help SMEs reduce negative impacts on the environment and surrounding communities, improve product quality, and increase business profits in the long run. For the government, this research emphasizes the importance of policies that support innovation, stakeholder involvement, and support for environmentally friendly infrastructure such as waste management, electricity sources, and clean water sources to achieve sustainability in the tourism industry. These policies and regulations should encourage companies to develop sustainable business practices, including reducing waste, recycling, and using environmentally friendly raw materials. In addition, the government needs to strictly supervise and inspect companies in conducting their business. This can be done to ensure that the company complies with established policies and regulations and implement sustainable business practices. Therefore, the government needs to develop strategies and policies that consider this to improve the performance and sustainability of the tourism industry.

Overall, the implication of this paper is an understanding of the importance of collaboration and involvement of all parties in innovating by utilizing support system facilities to achieve sustainability in the tourism industry. All parties must take responsibility and work together to create a sustainable and environmentally friendly business environment that provides long-term benefits for the environment, society, and the economy.

C. LIMITATIONS AND FUTURE RESEARCH DIRECTION
This research has opened new insights for researchers regarding the factors that influence optimal tourism industry performance and the sustainability of the tourism industry. However, this study has several limitations that can be refined in future studies. First, the data obtained is taken at quite a long time interval, namely from 2022 to 2023, when significant environmental changes occurred due to the co-19 pandemic. It would be more comprehensive if the data were collected at the right time and not too long. Second, the data obtained in this study is from SME data located around the tourist area of Rembang Regency, Central Java, and Banyuwangi Regency, East Java. At the same time, this research discusses the tourism industry in general. Third, this research refers to the sustainability of the tourism industry in general, so research that is more focused on the geographical context and the specific tourism industry is still needed. Finally, the data obtained in this study came from two different regions because they have the same characteristics. It would be more accurate if a multigroup analysis was carried out to check whether different objects could affect the results of this study or not.

Several opportunities can be found in this study for further research. Further research can characterize each SME implementing industrial sustainability based on its competitive level. This is an interesting issue because, in this study, the object of SMEs in the tourism industry still has low competitiveness. In addition, future research can further analyze the environmental impact analysis of sustainable tourism produced by the tourism industry and ways to reduce this impact. Future research can also explore the impact of technological innovation on the environment in the tourism industry to help sustain industries, such as waste management or energy-saving technologies.

APPENDIX
Sustainable Tourism Industry (STI)
Achievement of the tourism industry/organization in the economic, environmental, and social dimensions in an integrated manner by considering the interests of stakeholders.

Construct	Measure
STI1	The organization's profit from product sales in the last one-year period reached the target.
STI2	Production costs in the last one-year period did not exceed the budget.
STI3	The materials used in all industrial operational processes do not damage the environment.
STI4	Energy is used efficiently in all industrial operational processes.
STI5	Water is used efficiently during industrial operational processes (e.g., reuse of re-filtered wastewater).
STI6	Industrial operational waste does not harm the environment (e.g., liquid waste/solid waste).
STI7	Operations within the organization do not pollute the environment around the tourist area.
STI8	Employee safety in working for the organization is guaranteed.
STI9	The level of employee satisfaction while working for the organization is high.
STI10	Employees receive regular training opportunities from the organization.
STI11	The organization makes financial contributions to support local community activities.
STI12	The organization makes non-financial contributions in support of local community activities.

Tourism Industry Performance (TIP)

The measurement of all activities involves multiple agencies and sectors in the tourism industry and requires complex integration among those responsible for its development.

Construct	Measure
TIP1	This organization considers net profit trends as a measure of performance.
TIP2	The organization's net profit has increased consistently over the past year.
TIP3	This organization pays attention to increasing revenue as a measure of performance.
TIP4	Tourists are satisfied with the organization's products and services.
TIP5	This organization keeps employee morale high, especially during the pandemic.
TIP6	Productivity targets set by the organization have always been achieved over the past year.
TIP7	The quality of the products produced by workers is in accordance with the standards set by the organization.
TIP8	Products and services are received on time by tourists.
TIP9	Products made by the organization dominate the market.
TIP10	Total sales have increased over the past year.

Open Innovation (OI)
Inbound Open Innovation (IOI)

Innovation in organizations is carried out by exploring sources of innovation, such as new knowledge and technology from external sources such as customers, suppliers, competitors, government, consultants, universities, or research organizations.

Construct	Measure
IOI1	External parties are directly involved in innovation activities in the tourism industry.
IOI2	The government helps in innovation activities in the tourism industry.
IOI3	Tourists help in innovation activities in the tourism industry.
IOI4	Competitors help in innovation activities in the tourism industry.
IOI5	Research institutes assist in innovation activities in the tourism industry.
IOI6	Universities or educational institutions contribute to innovation activities in the tourism industry.
IOI7	Suppliers contribute to innovation activities in the tourism industry.
IOI8	Several consultants assist in innovation activities in the tourism industry.
IOI9	Innovation activities carried out by the tourism industry depend on external assistance.
IOI10	The tourism industry uses the latest tools to increase internal innovation.

Outbound Open Innovation (IOI)

Innovation within the organization is carried out by developing the organization's internal innovation capabilities so that the results can be provided to external organizations through licenses, patents, or certain contracts to obtain financial and non-financial benefits.

Construct	Measure
OOI1	The tourism industry seeks to gain other benefits from the internal innovations that have been carried out.
OOI2	The tourism industry offers new methods used by internal organizations in other organizations.
OOI3	The tourism industry sells tourism product licenses to other organizations.
OOI4	The tourism industry sells batik product patents to other organizations.
OOI5	New ways of developing tourism, new ways of promotion, and new ways of treating industrial waste, to be applied in other organizations.

Support System Facilities (SSF)
Power Source (PS)

The factor of the availability of electricity sources around the tourism industrial area to support all activities and activities.

Construct	Measure
PS1	There is an electricity network in the tourist area.
PS2	The electricity network can be used properly in tourist areas.
PS3	There is an adequate generator to anticipate problems in tourist areas.
PS4	Electrical network repairs in tourist areas can be done quickly (within 1 hour duration).
PS5	Electrical network inspection is carried out regularly (once a month).

Waste Management (WM)

The availability factor of waste treatment around the tourism industry.

Construct	Measure
WM1	Garbage collection in tourist areas is carried out every day.
WM2	Waste sorting is carried out by cleaning officers in tourist areas.
WM3	There are good trash cans that are easy to find in tourist areas.
WM4	Trash bins are available according to the type of waste (e.g., paper, plastic, organic waste).
WM5	Attractions are always clean, and no trash scattered around.

Clean Water Source (CW)

The availability and operational factors of clean water around tourist areas.

Construct	Measure
CW1	Clean water is available in tourist areas
CW2	There are drainage channels in tourist areas
CW3	Drainage channels are well maintained which are checked once a month

Stakeholders (SH)
Government (GOV)

Regulators and policy makers in creating tourism industry value, such as developing, supporting, and building the tourism industry, as well as coordinators and facilitators between various stakeholders.

Construct	Measure
GOV1	The government participates in promoting tourism through social media or similar means.
GOV2	The government held a special program to promote tourism.
GOV3	There is a government program related to skills training for residents around tourist areas in managing and promoting tourism.
GOV4	There is communication related to tourism between residents around the tour and the government.
GOV5	Government policies help the availability of facilities and infrastructure around tourist areas.
GOV6	The government is/will be planning programs that create tourism potential.
GOV7	There is cooperation with the government.

Tourism Area Management Institutions (TAM)

Organizational institutions were responsible for managing and developing the industrial tourism area in an integrated manner.

Construct	Measure
TAM1	Tourism area management agencies participate in promoting tourism through social media or similar means.
TAM2	Tourism area management agencies hold special programs to promote tourism.
TAM3	The policy of the tourism area management agency helps the availability of facilities and infrastructure around the tourist area.

Construct	Measure
TAM4	There is communication related to tourism between residents around the tour and the tourism area management agency.
TAM5	The policy of the tourism area management agency helps the availability of facilities and infrastructure around the tourist area.
TAM6	the tourism area management agency is/will be planning programs that create tourism potential.
TAM7	There is cooperation with tourism area management agencies.

Community and Society (CS)

Active participation of the public or communities that contribute, manage, and support tourism industry activities such as providing tourism facilities and services, promotion, and marketing.

Construct	Measure
CS1	The community and society participate in promoting tourism through social media or similar means.
CS2	Communities and society hold special programs to promote tourism.
CS3	Community and society policies help provide facilities and infrastructure around tourist areas.
CS4	There is communication related to tourism between residents around the tour and the community.
CS5	Community and society policies help provide facilities and infrastructure around tourist areas.
CS6	The community and society are/will be planning programs that create tourism potential.
CS7	Collaboration with the community and society.

Private Sector and Individual Shop Owners (PIO)

Various companies, shops, and businesses are directly involved in providing services and facilities for tourists.

Construct	Measure
PIO1	The private sector and SME owners participate in promoting tourism through social media or similar means.
PIO2	The private sector and SME owners hold special programs to promote tourism.
PIO3	Private sector policies and SME owners help provide facilities and infrastructure around tourist areas.
PIO4	There is communication related to tourism between residents around the tour with the private sector and IKM owners.
PIO5	Private sector policies and SME owners help provide facilities and infrastructure around tourist areas.
PIO6	The private sector and SME owners are/will be planning programs that create tourism potential.
PIO7	There is cooperation with the private sector and SME owners.

Environment Dynamism (ED)

Environmental conditions that refer to the current environment have no patterns and instability, so organizations must quickly adapt to their environment to continue exploring and exploiting external pressures.

Construct	Measure
ED1	In the last year the environment in tourist areas has changed a lot (especially during the pandemic).
ED2	There are changes in the habits of residents around the tourist area from year to year.
ED3	There is an additional potential for tourist areas from year to year.
ED4	There are routine government programs in promoting tourism.
ED5	There are regulatory changes regarding the development of the tourism industry.
ED6	Government regulations support the development of tourist areas.
ED7	In the past year (according to the accounting period) there has been an increase in the number of visiting tourists.
ED8	In the past year (according to the accounting period) there has been a decrease in the number of visiting tourists.
ED9	In the past year (according to the accounting period) there has been a change in the types of tourists visiting.
ED10	Every month there is a change in the number of sales of tourism industry products.
ED11	Every month there is a change in the type of service from the organization.
ED12	Changes in the type of service are influenced by general economic conditions.

Environmental Competitiveness (EC)

The current high level of competition requires companies to produce products or services that are cost efficient and at low prices.

Construct	Measure
EC1	These organizations/store owners/SME compete with others in the same tourism industry area.
EC2	These organizations/store owners/SME have major competitors in one area of the tourism industry.
EC3	High competition between organizations/store owners/SME in one area of the tourism industry.
EC4	There is high competition with other organizations that produce tourism products outside the region.
EC5	Competitive prices for tourism industry products are an advantage for the organization.
EC6	Prices of tourism industry products are determined by market competition.

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