IMPACT OF SIX SIXMA ON TOURISM INDUSTRIES PERFORMANCE IN INDONESIA: EVIDENCE FROM STRUCTURAL EQUATION MODEL

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Abstract: *Concept of Six Sigma is comprehensive for finding the appropriate strategy as of the industry can run as efficiently as possible and survive in an economic wave currently under challenging times, including the tourism industry, which is the object of this research. These papers examine an overview of the empirical study of relationships between six sigma strategies toward tourism industry performance. For many countries, tourism is seen as one of the instruments for developing country because it can trigger new economic activities. Tourism also has assertive economic impact on the balance of payments, unemployment, GDP, and profitability. Unplanned and uncontrolled tourism growth has an impact on financial sustainability. The methodology used in this research is quantitative by distributing an online questionnaire consisting of 16 statement items with a five-point Likert scale. The sample size used for this research is 300 tourism service providers in 10 of the city in Indonesia, which is the leading destination for tourists. This research was processed using smart PLS 3.2.9 analysis tools and methods research in this study using Structural Equation Modeling (SEM), namely the equation model with a variance-based approach or modeling component-based structural equations. The findings from this study indicate that the latent variable models are involvement and top management commitment, training and education, cultural change, industrial infrastructure, and teamwork has a fit outer model relationship (> 0.7) between latent variables and indicators of efficacious Six Sigma implementation in the tourism industry in Indonesia. However, top management commitment and industrial infrastructure have a low t value, so of course, this is a challenge and input for developing the tourism industry in Indonesia in the future.*

Keywords : *tourism ;six sigma; sustainability*

JEL Classification: *Z32; C51*

1. Introduction

The impact of the Covid-19 pandemic that hit Indonesia and other countries worldwide was felt. Tourism is the hardest-hit sector. Tourists cannot travel or enjoy

tourist destinations because the government has set stringent regulations. The impact is felt in the tourism sector, such as hotels, travel agencies, or tourist villages that were busy attracting visitors before the pandemic. Today's tourism market circulation is characterized by increasing international competition and rapidly changing and challenging customer demands. (Beritelli P et al., 2007); when the pandemic hit, the tourist destination was empty of visitors, as is known, the tourism sector is one of the contributors to foreign exchange and employment that is able to sustain the strength of a nation in running its economy. To maintain its contribution to modern economic growth, all forms of industry, including tourism, are required to improve the production quality to meet increasingly high market demands and high expectations level of precision in the midst of a pandemic (Yurim Zagloel et al., 2018). Published by (Meadow et al.,1972) entitled The Limit to Growth which caused the world to turn its attention to the sustainability process, including in the field of tourism, The essence of tourism destination development involves several problems, including the need to manage and coordinate many elements in the tourism destination system. (Iunius, R.F et al.,2915). The Central Statistics Agency of Indonesia (BPS) recently reported an increase in foreign tourist arrivals as of May 2022. According to the agency's report, tourist visits as of May 2022 reached 212,330 visits or an annual jump of 1,382.45 percent, and in January-May, it reached 397,770 visits or grew 616.40 percent. BPS released the publication on tourist visits in early July 2022. The report is undoubtedly fresh air for stakeholders and business people in the sector after the service industry has been in a slump for a long time. Meanwhile, based on data from the Indonesian Ministry of Creative Economy and Tourism, foreign tourists visiting Indonesia in July 2022 amounted to 476,970 visits or grew by 6,396.46% compared to July 2021, which amounted to 7,342 visits. Based on nationality, the number of foreign tourist visits in July 2022 at the main entrance and other gates (Non-MPD) recorded the highest number of visits, namely: Australia with 84,569 visits, Singapore with 59,802 visits, Malaysia with 42,551 visits, India with 27,756 visits, and the United States with 21,511 visits. A critical success factor is an essential ingredient required for the success of a Six Sigma project within an industry (Coronado, R. & Antony. J, 2002). In addition, most companies do not even know and realize how important the benefits of the Six Sigma concept are, so they cannot implement it effectively. (Zeeshan et al.,2017). The purpose of this study assumes that the industry performance can be an indicator of the success of Six Sigma implementation to answer the questions;(a)to investigate the critical success factors of the implementation of Six Sigma in the Indonesian tourism industry;(b)to investigate the successful implementation of Six Sigma in the Indonesian tourism

industry;(c) to investigate the correlation between latent variable as a critical success factor of the Indonesian tourism industry.

2. Literature Review

According to (Yurim Zagloel et al., 2018) In his research, It can be concluded that the overall view of the urgent critical success factor theory for this research can be measured by the following factors, namely; involvement and commitment of top management, training and education, teamwork, cultural change, and industrial infrastructure. In the literature review by identifying the use of PLS-SEM in measuring the impact of six sigma towards sustainability (Barcia et al., 2022), implementing five categories of search criteria into the database platform as a methodology for measuring the impact of six Sigma on industrial sustainability; the results of the research are Six Sigma has a positive effect on 83% of economic indicators, 78% of environmental indicators, and 70% of social indicators. Furthermore, other studies observing the implementation of six sigma in the SMES industry and its outputs show that management style has a positive impact on SMES environmental performance. (Ali et al., 2021). The implementation of six sigma is a continuous steps that contains elements of continuous improvement (Kaizen); of course, it is not easy to make these efforts, so it is classified as a unique application and difficult to implement. The principle is based on resource efficiency and waste minimization; therefore, it can be measured significantly from the perspective of financial turnover, product life cycle, and increasing competition worldwide. The tourism sector itself is an interesting industry to study; along with the development of science, there are only a few studies in this field, one of which is by (Foris et al., 2020). The Six Sigma method is claimed by the Tourism Promotion and Development Association (APDT) in Brasov, Romania to have been implemented for the management of tourist destinations; by conducting a series of practical application testing frameworks that guarantee the management of tourist destinations. According to (Henderson et al., 2000) this pattern consists of five critical success factors that has been used in previous studies that is Top management involvement and commitment, is a determining factor for the successful implementation of the six sigma; Training and Education. Training and education programs are essential for implementing Six Sigma stages. Creating new goals for the company is possible when employees can act and think (Szeto. A et al., 2005); Teamwork is how employees interact in a group that directly actively supports and helps one another. Teamwork is a variable that cannot be avoided because of effective communication.(Carvalho & Pinto, 2014); Cultural Change. An industry

can be said to be successful if it can synergize with culture and create positive relationships with the surrounding environment. research has concluded that the collaboration of Supply Chain Orientation (SCO) and environmental cultural orientation makes a positive contribution to the environmental performance of a company or organization. (Kirchoff et al., 2016); Industrial Infrastructure. Six Sigma functions to maximize and maintain business success. It has been adopted by various levels of the organization to meet consumer needs to achieve the target. Research in Turkey illustrates that the implementation of Six Sigma for company performance results in an 80-100% increase in business profitability, thus showing the impact of Six Sigma on a company's business performance (Erturk et al., 2016).

3. Research Methodology

The measurement of six Sigma on the performance of the tourism industry Using online survey questionnaires using mechanisms and approaches according to research needs and the objects studied are related to the implementation of six sigma which have been implemented by several tourism service providers in Indonesia. This stage is of course carried out to test the model of the five latent variables along with the appropriate indicators with the literature in the previous chapter.Questionnaires were distributed to tourism service providers who had implemented Six Sigma in Indonesia. A total of 16 questionnaire questions items along with 300 respondents were applied to five measurement scales. The results of the answers from the respondents were interpreted on a five-point Likert scale ranging from 5 (strongly agree) to 1 (strongly disagree). The quantitative method approach is implemented in data analysis for further processing in software, in this case, using the Smart PLS application. In this study, a qualitative approach was also used because the question instrument was chosen to measure and analyze each indicator which was collected based on the progress of the development of the tourism industry in in ten main tourism destination cities in Indonesia, namely Jakarta, Bali, Papua, North Sulawesi, West Nusa Tenggara, Southeast Sulawesi, South Sulawesi, East Kalimantan, North Sumatra, Central Java with several contradictory assumptions and practice to provide authentic evidence to test the hypotheses and parameters of the SEM model. SEM models contribute very well to researchers working with structural equation models, such as using non-normally distributed data, small sample sizes, and indicators of formative research models (Hair J. Black, 2014). A schematic diagram of this research model is shown in figure 1.

Figure 1. Laten Variable Model Diagram
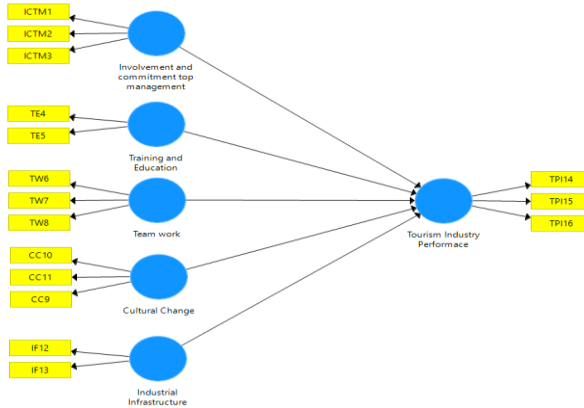
Source: Smart PLS

4. Findings and Result

4.1 Outer model testing

To see the validity and reliability of a model, outer testing is carried out. The analysis of this test can be seen from the value of the Loading factor, average variance extract (AVE), Discriminant Validity, and Composite Reliability. The outer model is the initial stage in testing the validity of a model; a condition for factor loading must be > 0.6 (Taherdoost et al., 2014) so that the indicator is said to be valid. If it is not valid, then it must be deleted model. To find out the analysis of the outer model of this research can be seen in Figure 2 below.
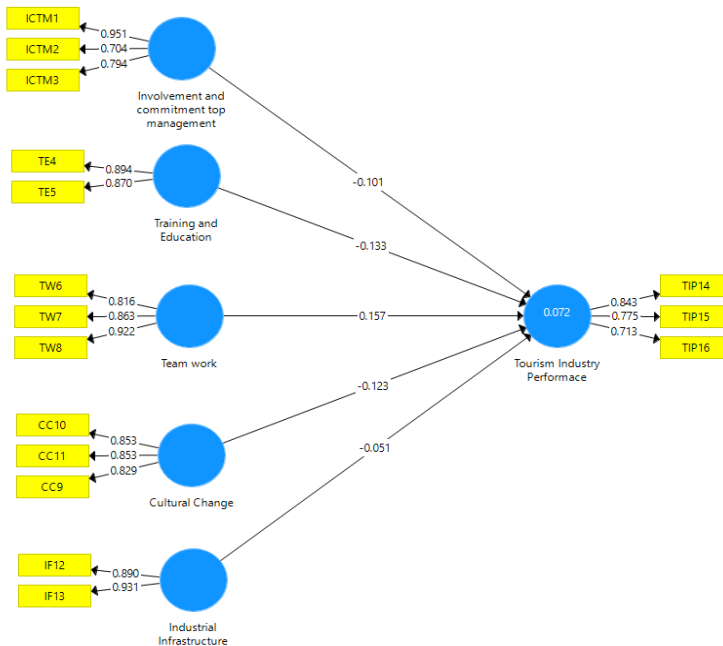

Figure 2. Algorithm Loading model Exploratory
Source: Smart PLS

Based on Figure 2, it can be concluded that the results of data processing obtained the largest number for the loading factor between the indicator and the latent variable is 0.951 (ICTM1), and the lowest is 0.704 (ICTM2), and there is no latent variable value that has a loading factor below 0.7. This proves that the model is feasible to be tested to the next stage, or in other words, the latent variable has good convergent validity. Thus, to see if the latent variables and their indicators have good reliability can be seen in table 1 below, which shows each latent variable and its indicators with Cronbach Alpha criteria of more than 0.7(Amora, 2021) and the AVE value is greater than 0.5 (Sekaran, Bougie 2016). Based on the first research question, ICTM, TE, TW, CC, and IF are critical factors for the successful implementation of the six sigma model in the tourism industry in Indonesia.

Tabel.1 Construct Reliability and Validity

|	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Cultural Change	0.805	0.829	0.882	0.714
Industrial Infrastructure	0.797	0.826	0.907	0.830
Involvement and commitment top management	0.814	1.450	0.861	0.676
Teamwork	0.850	0.996	0.901	0.754
Tourism Industry Performance	0.682	0.709	0.822	0.607
Training and Education	0.715	0.720	0.875	0.778

Source: Smart PLS

From the results of the Construct Reliability and Validity above, it can be concluded and answered the second question of this study latent variable elements and their indicators can be used to measure Tourism Industry Performance in Indonesia through the implementation of six Sigma, which has been and is currently being implemented.

4.2. Hypothesis test

Procedures are carried out bootstrapping to assess the significance of the effect of standards between variables. Based on the results of the path coefficients in table 2 below, it shows that the variables Training and Education (TE), Teamwork (TW), and Cultural Change (CC) are significant to the construct with a t-statistic value >

1.96 and a p-value <0 .05, while Industrial Infrastructure (IF) and Involvement and commitment top management (ICTM) have a t-value <1.96. This proves that in accordance with the third research question, ICTM and IF as a model do not have a significant influence on Tourism Industry Performance, even though the author's justification in the field assumes that there are several tourism service providers in Indonesia through the commitment of the leadership and management committees who have collaborated to implement six sigma model in tourism programs. On a macro level, the tourism industry in Indonesia has yet to play a strategic role in creating six sigma principles for tourism service providers due to a lack of knowledge and financial limitations. Nonetheless, this research proves that exploratory six sigma training and education programs have been encouraged in the tourism industry in Indonesia, teamwork has a very important role in the progress of implementing the six sigma model, and it should be noted that Indonesia does have a culture change that can gradually be accepting advances in science and technology.
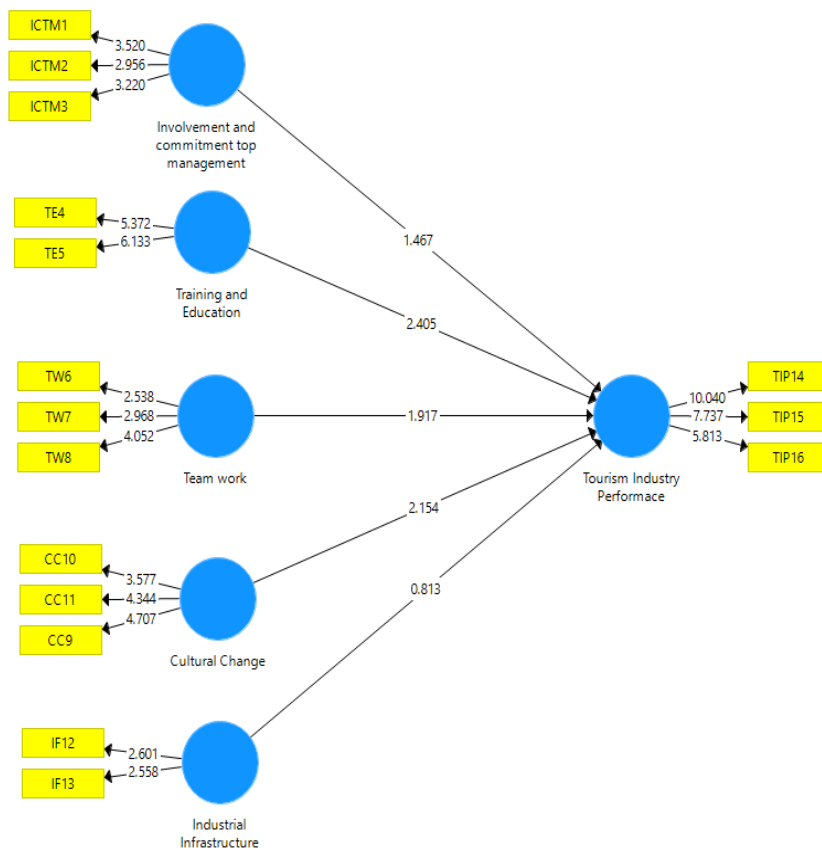
Tabel.2 Bootstrapping Analysis Result
Source: Smart PLS

4.3 Path Coefficient

The path coefficient (path coefficient) is a value that is useful to indicate the direction of the relationship to the variable, whether a hypothesis has a positive or negative direction. The path coefficient has a value in the range of -1 to 1. If the value is in the range of 0 to 1, it can be stated as positive, whereas if the value is in the range of -1 to 0, it can be stated as negative. The positive and negative relationships between latent variables and their indicators can be seen in table 3 below.

Tabel.3 Path Coefficient

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Cultural Change -> Tourism Industry Performace	0.123	-0.138	0.057	2.154	0.032
Industrial Infrastructure -> Tourism Industry Performace	-0.051	-0.057	0.063	0.813	0.417
Involvement and commitment top management -> Tourism Industry Performace	-0.101	-0.105	0.069	1.467	0.143
Teamwork -> Tourism Industry Performace	0.157	0.169	0.082	1.917	0.056
Training and Education -> Tourism Industry Performace	0.133	-0.137	0.055	2.405	0.017

Source: Smart PLS

From the table above, it can be concluded that the relationship between Cultural Change, Teamwork, and Training and Education has a positive association with Tourism Industry Performance, while Industrial Infrastructure and Involvement and top management commitment have a negative association with Tourism Industry Performance, following up on these results as previously stated that in practice Industrial Infrastructure and Involvement and commitment top management have a

role in the implementation of the six sigma model in the tourism industry in Indonesia.

5. Conclusion and Recommendations

Even though there has been a lot of research in the field of tourism, the novelty of the research is that it contributes to the fact that there are still many tourism industries in Indonesia or in other countries that need to maintain the sustainability of this industry and continue to make improvements by implementing six sigma models, especially after Covid-19 and the world is currently being hit by the economic crisis caused by war, political interests and so forth. While economic conditions are uncertain, companies in the tourism sector, especially in Indonesia, can still make cost savings and maintain and even improve the quality of their services. There is a proven effective way to do this, namely by adopting the principles of Six Sigma. In the future, of course, there will be many challenges faced by Indonesia and other countries, and stressed by authors is financing and investment as well as improving infrastructure and quality; therefore, it is hoped that the results of this research can make a positive contribution to tourism service providers.

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