MODEL OF TOURISM SECTOR PERFORMANCE IMPROVEMENT BASED ON APPLIED TECHNOLOGY INNOVATION

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Abstract *– Tourism is one of the largest sectors in the world economy. Improving the tourism sector's performance is one of the priority programs for national development of the government of the Republic of Indonesia to encourage the country's foreign exchange earnings. The lack of various applied technology innovations in digital marketing strategies is a problem that can impact the performance of the tourism business, in particular in the digital era of the industry today. The aim of this study is to develop a model of tourism sector performance improvement based on applied technology innovation. In this quantitative research method, an empirical survey uses questionnaires distributed online and sample data collection using a purposive random sampling technique. Valid data is processed using smartPLS software. The empirical analysis was carried out to test the model and hypothesis in this study. The main results ofthis study reveal that applied technological innovation significantly mediates the influence of digital marketing strategies on the performance of the tourismsector in Indonesia. Furthermore, other results reveal that applied technological innovation also has the potential to moderate or strengthen the influence of digital marketing strategies to improve Indonesia's tourism sector's performance. The results of this model contribute to supporting the national program of the Indonesian government to improve the performance of the tourism business in Indonesia based on applied technology innovation in digital marketing strategies.*

Keywords: applied technology innovation, digital marketing strategy, model, tourism sector performance.

I. INTRODUCTION

Tourism is one of the largest and strongest sectors in the world economy. The tourism sector in Indonesia is strategic in driving economic development. Not only is it a trigger for production and consumption, but tourism can also improve the investment climate of an area (Artiningsih et al. 220). The term tourism comes from Sanskrit which consists of two syllables, namely "pari" and "wisata". Pari means repeatedly or many times, while Wisata means travel or traveling. So tourism means travel that is carried out repeatedly (Sapta & Landra 2018).

According to the Central Bureau of Statistics (2022), stated that 2022 will be a momentum for the revival of Indonesian tourism which is supported by various international events organized by the Indonesian government. The arrival of foreign tourists to Indonesia in 2022 increased by 278.10 percent compared to 2021, with tourist arrivals of 5.89 million visits in 2022. The growth of the tourism and travel sector to Indonesia's GDP is 5.2%. The Travel & Tourism Competitiveness Index is an index to measure the policies implemented by a country in supporting the sustainability of *the Travel & Tourism business.* Based on this index, in 2018 Indonesia is ranked 50th in the world

and 4th in ASEAN (Sabon et al. 2018) The recovery of the tourism and creative economy sectors has strengthened after the pandemic, although they have not yet reached pre-pandemic levels. Based on this index, in 2018 Indonesia is ranked 50th in the world and4th in ASEAN (Sabon et al. 2018).

The tourism business is a business that provides goods and or services to meet the needs of tourists and organize tourism (Sapta & Landra 2018). The tourism sector is indeed quite promising to help increase foreign exchange reserves and pragmatically is also able to increase people's income. Indicators for improving the performance of the tourism sector refer to the Travel and Tourism Competitiveness Indexes (TTCI), namely: (1) *Infrastructure,* Accessibility is very important in ensuring the comfort of tourists. How to increase tourism is done by building infrastructure, as well as access to information through social media and the official website of tourist destinations and information counters, (2) *Natural and Cultural Resources,* natural and cultural resources are indicators that attract tourists and visit touristdestinations. Management and preservation of culture and nature is the right way to increase the index of *natural and cultural resources.*Local wisdom and culture can also be one of the attractions for tourists to visit. (3) *Tourism Inbound,* is the number of tourists who visit. Marketing has an important role in attracting tourists. Promotional budget spending has an impact on the number of visiting tourists, The government's efforts to improve the industry are still being carried out. One of the government's efforts is to invite entrepreneurs to have a digital marketing strategy in the tourism services sector by implementing technological innovations to improve the performance of the tourism sector.The central government, regional governments, academics,and tourism industry players are expected to beable to work together to build the country with applied technological innovations towards an independent Indonesia.

According to Putri and Arief (2023), "Digital marketing" or commonly referred to as "Digital Marketing" is all efforts made in terms of marketing using internet-connected devices with various strategies and digital media whose goal is to be able to communicate with potential consumers with online communication channels. In this study, the Digital Marketing Strategy is a marketing strategy that utilizes various information technologies that are increasingly developing. According to (Sabon et al. 2018) ,The digital marketing strategy refers to *the* Travel & Tourism Competitiveness Index (TTCI), which is an index to measure policies implemented by a country in supporting the sustainability of the *Travel & Tourism business.* Based on this index, in 2018 Indonesia is ranked 50th in the world and 4th in ASEAN (Sabon et al. 2018). There are three digital marketing strategies used as indicators related to the performance of the tourism sector in Indonesia, namely: (1) *DOT (Destination, Origin, Timeline),* The implementation of the DOT approach differs depending on the market. The DOT approach contains tourist activities, tourist information and a calendar of major tourist events that can invite many tourists. (2) *BAS (Branding, Advertising, and Selling),* Branding indications are important in marketing the tourism sector. For example, the Indonesian tourism brand is “Wonderful Indonesia”. Next, are advertising activities carried out through print/electronic media, event marketing, cooperation with foreign websites. The selling indicator is the stage where Indonesian tourism is sold itself, such as nature tourism, handicrafts, souvenirs, tourism convenience and so on. (3) *POSE (Paid media, Own media, Social media, Endorsement).* Paid media is marketing done with paid media, like the Discovery Channel for example. Meanwhile, Own media uses official marketing media, such as the official website of the Ministry of Tourism or local government websites related to tourist and cultural destinations. Social media is used by sharing links or information about the tourism sector in Indonesia. This encourages the community to get involved. The last approach is Endorser, which is a method that is carried out through contracts with several artists to become ambassadors for Indonesian tourism.

Technological innovation plays an important role in society to meet needs, achieve goals, and solve problems of adopters directed to support corporate, industrial, economic, and social change for the competitive advantage of

companies and nations, and enhance overall human progress (Coccia, 2021). Technological Innovation is a business innovation that relies on Information Technology which is applied in this study in the tourism sector.Innovation is very important in business. The word innovation, according to Lin and Jung in 2006, comes from the Latin word, " *innovare* : which means "to make something new " (Legowo et al. 2020). A technological innovation is a new or improved product or process whose technological characteristics are very different from those before. While Applied Technology is a technology that is applied to a community business in a particular sector, so that it will be able to make adjustments to various forms of environmental, ethical, cultural, social, political to the economic aspects of the community which will be interrelated (Coccia 2021). Applied technology innovation in a business is usually indicated by the existence of new products/services (Jovany et al. 2019) (product/service innovation), new process innovations in applied technology (Pozo et al. 2019), and new business model related to technological innovations (Pollari 2016).

The main problem that will be studied and developed as a research model is whether Applied Technology Innovation has a significant role in mediating and moderating digital marketing strategies to improve the performance of the tourism sector in Indonesia so that it can contribute to the government's efforts to drive the national economy.

Previous studies related to tour and travel services have been carried out by several researchers. Putri & Arif 's study (2023) concluded that there is an influence of digital marketing and product innovation on income as a factor of business performance. Sabon et al. (2018) in his study discusses strategies to improve the performance of the Indonesian tourism sector in the Asean Economic Community. The output of this study is in the form of recommendations to improve the performance of the Indonesian tourism sector.

This study on applied technological innovation in improving the tourism performance in Indonesia leads to the government's goal of encouraging synergy to build the country with applied technological innovations in the hope that Indonesia will be more advanced and independent. This means that with the applied innovation study this technology is expected to be able to provide input and a real contribution that for the improvement Indonesia's tourism sector so that it supports towards an independent Indonesian economy. This study is also related to the Halal Ecosystem and Tourism. The halal ecosystem is a complex system of businesses, institutions, government agencies, and non-governmental organizations. There are five sectors in the halal ecosystem: goods,services, infrastructure, human resources, and government support.

Research activities require novelty which certainly will not be obtained from duplication and replication. That is what experts often refer to as the " *State of the Arts"* which is considered as one of the important keys in conducting scientific research. State of the Arts' in this study, shown in Figure 1.

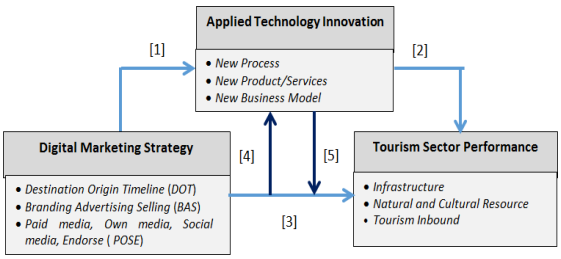

Figure 1. State of the Arts

Based on "*State of the Arts"*, this study develops a new research model to examine the role of applied technological innovation in mediating and moderating the effect of digital marketing strategies on the performance of the tourism sector in Indonesia.

The aim of this study is to develop a model of tourism sector performance improvement based on applied technology innovation The objectives to be achieved from this model are:

(1) to analyze empirically whether applied technological innovation has a role in mediating digital marketing strategies to improve the performance of the tourism sector in Indonesia,

(2) to analyze the issue of whether the role of

pure FinTech is in moderating digital marketing strategies to improve the performance of the tourism sector in Indonesia.

The model of this study makes a significant contribution to supporting the Indonesian government's national program to improve the performance of the tourism business in Indonesia, particularly the role of applied technological innovation in digital marketing strategy.

II. METHODS

This research is empirical study, using a quantitative approach.

Data Collection

For the application of the quantitative method, data collection through a questionnaire survey technique was collected using an online survey. Thus, the unit of analysis of this study is the community, both domestic and foreign tourists. Travel in Indonesia. Of the 150 respondents, samples were taken using purposive random sampling technique. In the end, 100 valid samples became valid samples.

Data Analysis

SmartPLS 3.2.7 is software used for data analysis. Likert scale to measure the variables of this study (Scale 5), with criteria starting from strongly disagree (scale 1) to strongly agree (scale 5). The main empirical test is the

evaluation of the inner and outer models of the research model proposed. For this study, evaluate the Outer Model by evaluating the validity and reliability of variables and their indicators, where values are used Cronbach's Alpha and Composite Reliability (value > 0.7). According to Hussain et al, (Hussain et al. 2018) stated that the evaluation of the Inner Model was evaluated, among others, through the value of the Goodness of Fit (GoF) And R-square (R2). The hypothesis was tested using a P-Value < 5% and a T-Statistic > 1,960 (Creswell 2017).

Conceptual Framework

A conceptual framework is a blueprint or guide for research model (Adom et al. 2018). With reference to the previous 'State of the Art' developed in this study, the research model can be shown in Figure 2.

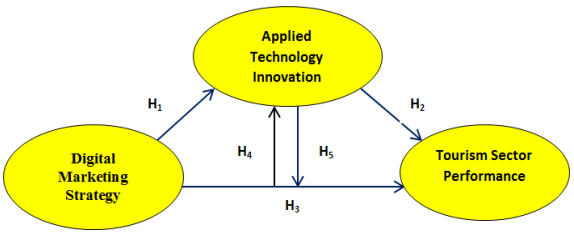

Figure 2. Research Model

Based on Figure 2, the hypothesis can be developed as follows:

The digital marketing strategy is to achieve business goals through digital technology innovation, and there are many innovations in the field of digital marketing (Sitlani and Agarwal 2018), so the hypothesis developed is:

H_1: Digital Marketing Strategy has a positive effect on Applied Technology Innovation

According to the Indonesian Ministry of Tourism and Creative Economy in the Tourism Industry Trends Book-2021, the tourism industry has experienced very fast digital growth in recent years. Tourist activities and visits that have an impact on the performance of the tourism sector, especially in planning trips, *pre-on-post journey*, due to applied technological innovations which have almost entirely adopted digital. Then the hypothesis:

H_2: Applied Technology Innovation has a positive effect on the Performance of the Tourism Sector.

According to the Study from Sabon et al. (2018) digital marketing strategies such as DOT, BAS and POSE can improve the performance of the tourism sector, especially regarding the number of tourist visits. So, the hypothesis is developed, as follows:

H_3: Digital Marketing Strategy has a positive effect on Tourism Sector Performance.

Business drivers have an impact on technology and the existence of a FinTech mechanism has

a strong influence on the technological innovations that can be produced. then based on this hypothesis is developed:

H_4: Applied Technology Innovation mediates the effect of Digital Marketing Strategy on Tourism Sector Performance.

Business drivers have an impact on technology and the existence of a FinTech mechanism has a strong influence on the technological innovations that can be produced. then based on this hypothesis is developed:

H_5: Applied Technology Innovation moderates the effect of Digital Marketing Strategy on Tourism Sector Performance

III. RESULTS AND DISCUSSION

The results of this empirical study, especially here, present the results of model testing and hypothesis testing in this study.

Model Testing Results

Analysis of the results of measuring the validity and reliability of the research variables by looking at Cronbach's Alpha and Composite Reliability values as well as the results of data processing and execution with Smart-PLS version 3.2 (Hussain et al. 2018).

Table 1. Validity and Reliability Test Results

Variable	Cronbach Alpha	Rho A	Composite Reliability	AVE
Digital Marketing Strategy	**0.895**	**0.906**	**0.935**	**0.829**
Applied Technology Innovation	**0.872**	**0.891**	**0.923**	**0.801**
Tourism Sector Performance	**0.8I3**	**0.816**	**0.889**	**0.728**
Moderating Effect 1	**1.000**	**1.000**	**1.000**	**1.000**

Table 1 shows the value of Cronbach's Alpha > 0.7, and Composite Reliability > 0.7. These results indicate that all the variables used in the research are valid and reliable.

The results of the Inner Model Test by looking at the Outer Loading value, shown in Figure 3.

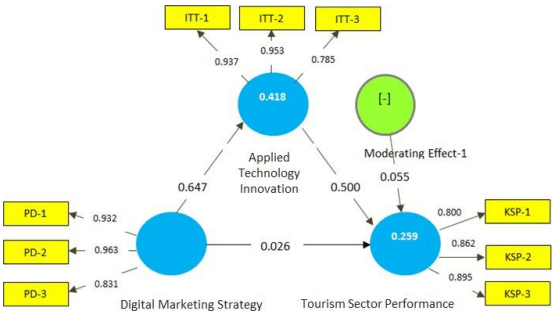

Figure 3. The output of Outer Loading

The indicator that has the most influence on the digital marketing strategy variable is the BAS indicator (PD2), with a value of 0.963 and the lowest is the POSE indicator with a value of 0.831. In the Applied Technology Innovation variable, the most influential indicator is New Products/Services (IT2), with a value of 0.953 and the lowest is *the New Business Model* (IT3) indicator. Finally, themost influential Tourism Sector Performance variable is the Tourism Inbound indicator, withan outer loading value of 0.895 and the lowest is the Infrastructure indicator with a value of 0.800.

The results of the study using Structural Equation Modeling (SEM) analysis obtained the following equation:

$$ATI = \beta_{11}DMS + \xi_1 \quad (1)$$

Applied_Technology_Innovation = 0.647*Digital_Marketing + ξ1

$$TSP = \beta_{12}DMS + \beta_{13}ATI + \beta_{13}DMS*ATI + \xi_2 \quad (2)$$

Tourism Sector Performance = 0.647*Digital_Marketing + 0.500*Applied_Technology_Innovation + 0.323*Digital_Marketing*AppliedTechnology Innovation + ξ_2

where :

β = *coefficient value beta* and,

ξ = *measurement error*

In testing the structural model (Inner Model), the overall fit index is measured using the *Goodness of Fit (GoF*) criteria, Q-square

values, and R-square values (Hussain et al. 2018) . The value of *Goodness of Fit (GoF*) is determined using the following formula:

Goodness of Fit (GoF)

$= \sqrt{average\ communality \times average\ R-square}$

$=\sqrt{0.391 \times 0.339}$

$=\sqrt{0.132}$

$= 0.364$

The Q-square value is determined by the following formula:

$Q\text{-}square = 1 - [(1 - R_1^2)x(1 - R_2^2)]$ (4)

$= 1 - [\ (1-(0.418)^{\ 2}\ )\ x\ (\ 1-(0.259)^{\ 2}\ )]$

$= 1 - 0.770$

$= \mathbf{0.230}$

From the results of testing the inner model by looking at the magnitude of the GoF value, it shows that the model has a very high overall suitability index (GoF value > 0.360). In addition, the model has a very high level of predictive relevance (*Q-square value* = 0.230 > 0.20). Applied Technology Innovation Variables have a value of 0.418 for *R-square* and 0.259 for Tourism Sector Performance. This means that Applied TechnologyInnovation has a very high influence category because the *R-square value* > 0.30, while Tourism Sector Performance has a low influence category. These results are shown in Table 2.

Table 2. Inner Model Test Results

Variable	*R-Square*	*Communality*	*GoF*	*Q-Square*
Digital Marketing Strategy		**0.647**		
Applied Technology Innovation	**0.418**	**0.500**	**0.364**	**0.230**
Tourism Sector Performance	**0.259**	**0.026**		

Source: 2023 Research Data Processed Results

Other results state that 41.8% of Applied Technology Innovation is influenced byDigital Marketing strategy factors, so that 58.2% of Applied Technology Innovation isinfluenced by other factors not discussed inthis study. Conversely, 25.9% of Tourism Sector Performance is influenced by DigitalMarketing Strategy and Applied TechnologyInnovation. Then 74.1% by other factors not discussed in this study.

Hypothesis Testing Results

All the results of the analysis of hypothesis testing are shown in Table 3.

Table 3. Hypothesis Testing Results

Hypotheses	*Original Sanple*	*Sample Mean*	*StDev*	*T-Stat*	*P-Value*
H1: DMS→ATI	**0.647**	**0.648**	**0.067**	**9.589**	**0.000**
H2: ATI→TSP	**0.500**	**0.502**	0.103	4,845	**0.000**
H3: DMS→TSP	**0.349**	**0.366**	0.104	3,350	**0.001**
H4: DMS→ATI →>TSP	**0.323**	**0.326**	0.078	4,160	**0.000**
H5 ME-1→TSP	**0.055**	**0.062**	0.065	**0.842**	**0.400**

Source: 2023 Research Data Processed Results

The results of hypothesis testing can then be analyzed and explained as follows:

H1: Digital Marketing has a positive and significant effect on Applied Technology Innovation . The Beta coefficient value is 0.647, the T-statistic value = 9.589 (> 1.96), and the P-Value is 0.000 (< 0.05).

H2: Applied Technology Innovation has a positive and significant effect on Tourism Business Performance . The Beta coefficient value is 0.500, and the T-statistic value = 4.845(> 1.96), and the P-Value is 0.000 (< 0.05).

H3: Digital Marketing has a positive and significant effect on Tourism Business Performance . The Beta coefficient value is 0.349, the T-statistic value = 3.350 (> 1.96), and the P-Value is 0.001 (< 0.05).

H4: Applied Technology Innovation significantly mediates Digital Marketing for Tourism Business Performance. Beta coefficient value = 0.647 x 0.500 = 0.323 (> 0.026), T-statistic value = 4.160 (> 1.96), and P-Value 0.000 (< 0.05).

H5: Applied Technology Innovation is notpure in moderating Digital Marketing for Tourism Business Performance . The beta coefficient value is 0.055, the T-statistic value = 0.842 (<

1.96), and the P-Value is 0.400 (> 0.05). However, Applied TechnologyInnovation will have the potential to significantly moderate Digital Marketing for Tourism Sector Performance. Based on FinTech has a positive and significant impact on the Performance of the Tourism Sector . The beta coefficient value is 0.500 (> 0.055), the T-statistic value is 4.845 (> 1.96), and the P-Value is 0.00 (< 0.05). It is also proven bythe *R-Square value* Applied Technology Innovation of 0.418 > *R-Square* value The performance of the tourism sector is 0.259.

Discussion

The results of the model test in this study indicate that all of the research variables are very valid and reliable. All variables have a Cronbach's Alpha value > 0.7, and Composite Reliability > 0.7. The results of the Inner Model Test based on measuring the highest Outer Loading value for each variable reveal that in the tourism sector it turns out that digital marketing strategies use more *Branding, Advertising* and *Selling* (*BAS*) strategies to produce new tourism products or services in applied technological innovations, so that the performance of the tourism sector leads to an increase in the number of tourist visits. However, the thing that is lacking and must be considered in order to increase theperformance of the tourism sector based on the lowest outerloading value, namely that the tourism sector is still not optimal in using digital marketing strategies.

Paid media, Own media, Social media, Endorse (*POSE*) and applied technology innovation are still lacking to produce new business model innovations, furthermore the sector's performance is still not optimal in terms of tourism infrastructure (related to tourism accessibility). The results of testing *the inner model* by looking at the magnitude of theGoF value show that the model has a very high overall suitability index, has a very high level of predictive relevance (based on the *Q Square value*) and has a very high influence category, by looking at the *R-square value.* Other results state that 41.8% of Applied Technology Innovation is influenced by Digital Marketing strategy factors, so that 58.2% of Applied Technology Innovation is influenced by other factors not discussed in this study. In contrast, 25.9% of tourism sector performance is influenced by digital marketing and applied technology innovation, and 74.1% by other factors not discussed in this study.

The results of the hypothesis test in this study show that digital marketing strategies have a positive effect on applied technological innovation (H1). This is in line with the study of Sitlani and Agarwal (2018), which statesthat the digital marketing strategy is to achieve business goals can be done through applied digital technology innovations. The results of testing the hypothesis (H2) reveal that applied technological innovation has a positive effect on the performance of the tourism sector. This is supported by publications from the Indonesian Ministry of Tourism and Creative Economy in his book which states that tourist activity and visits have an impact on the performance of the tourism sector, due to applied technological innovations which have almost entirely adopted digital. The hypothesis test (H3) reveals that the digital marketing strategy has a positive and significant effect on the performance of the tourism sector. These results are in line with the results of research by Sabon et al. (2018) which states that the digital marketing strategy implemented can improve the performance of the tourism sector, especially related to the number of tourist visits. In the fourth research hypothesis (H4), the results show that applied technological innovation has a role in mediating digital marketing strategies for the performance of the tourism sector. Furthermore, the results of the fifth hypothesis (H5) reveal that applied technological innovation has a potential influence in moderating the effect of digital marketing strategies on the performance of the tourism sector. These two hypotheses (H4 and H5) are novel in this study.

This finding has deeper implications, from theoretical and practical aspects, especially researchers and practitioners in the tourism sector in Indonesia, that the role of applied technological innovation is very significant in improving the performance of the tourism sector.

Suggestions or recommendations that can be given from the results of this study are as

follows: First, by looking at infrastructure indicators in tourism sector performance, the central or regional government needs to improve infrastructure facilities that support tourist accessibility. Second, all entrepreneurs engaged in this sector must be encouraged to be more active in promoting promotions through social media or related to POSE because they do not have large costs for marketing. Third, entrepreneurs in the tourism sector must innovate applied technology to produce new business models to mediate and strengthen digital marketing strategies for the performance of the tourism sector.

This paper has several limitations: First, these findings limit the study to the selected tourism industries in the Indonesian context. Second, there are some elements of research regarding the method which may limit the empirical findings due to the small sample size. Lastly, the questionnaire approach is not completely free from the subjectivity of the respondents.

IV. CONCLUSION

In summary, this study emphasizes the development of a model for improving the performance of the tourism sector in Indonesia based on applied technological innovation.

The results of the model development reveal that applied technological innovation is able to significantly mediate digital marketing strategies to improve the performance of the tourism sector.

In addition, applied technological innovation has the potential to moderate the influence of digital marketing strategies on the performance of the tourism sector.

For future research, research related to the application of other information technologies, such as artificial intelligence, in the tourism sector is very much needed.

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