



Article

# Digital Marketing Utilization Index for Evaluating and Improving Company Digital Marketing Capability

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**Abstract:** The convergence of information technology, media, and telecommunications has altered consumer behavior in terms of searching, obtaining, processing, and responding to a company's information or services. The ability of a company to plan, implement, and manage digital marketing to increase its competitiveness in the eyes of consumers is referred to as digital marketing capability. This research presents a digital marketing utilization index (DMUI) to evaluate and improve a company's digital marketing capability. DMUI is made up of three components: the innovation ecosystem readiness, the adoption of digital marketing technology, and the company's digital transformation. Based on data from 217 companies in Indonesia, the results show that the DMUI of companies in Indonesia has an average of 71.97, indicating that the level of digital marketing capabilities of companies in Indonesia is in the medium category. They can improve their digital marketing capabilities by increasing the role of managerial innovativeness, organizational readiness, and perceived usefulness. Furthermore, businesses must carry out digital transformation by governing the transformation and reinvention of new business models. Finally, in addition to implementing digital marketing via websites, social media, mobile marketing, and content marketing, they must emphasize the importance of digital analytics, digital CRM, digital advertising, and display advertising to improve their company's digital marketing capabilities.



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**Keywords:** digital marketing; capability; ecosystem; index; innovation; technology; transformation

## 1. Introduction

The COVID-19 pandemic, besides having an impact on increasing consumer habits in consuming media, also had an impact on increasing the number of internet users, the use of digital devices, and also increasing online activities. Datareportal [1] shows that internet users in the world reached 4.66 billion or 59.5% of the total world population of 7.83 billion. Internet users in Indonesia reached 202.6 million (73.7%) or an increase of 27 million (16%) compared to the previous year, while active users of social media in Indonesia reached 170.0 million (61.8%) or an increase of 10 million (6.3%) compared to the previous year.

Companies as producers, facing a new marketing paradigm, have to adapt to the unprecedented changes in the marketing landscape [2]. The new marketing landscape has brought companies to conditions that require them to not only exist in the conventional competitive arena but also, at the same time, exist in the digital-based marketing arena. Manufacturers prepare themselves to provide the right answer to the needs and interests of consumers, producers also learn how to reach and engage their consumers through valuable information. Therefore, to seize opportunities or opportunities in the new marketing landscape, companies need to adjust their strategies in the digital marketing arena to gain new customers and maintain their customer loyalty and support. For that, companies must have digital marketing capabilities.

Digital marketing capability is the company's ability to plan and implement digital marketing [3]. This capability refers to the processes, structures, and skills that are the foundational assets of a company enabling it to succeed in the digital age. In other literature,

digital marketing capability is the company’s competence to use the internet and other information technologies to facilitate deep interactions with customers. These interactions give customers access to company resources and information as well as provide companies with information about their customers [4,5]. Based on these explanations, it can be concluded that digital marketing is not only about the adoption of digital marketing technology, but also about how companies can plan, implement, and manage their digital marketing. Companies must have digital marketing capabilities because they can improve business performance. According to the findings of Field [5], companies can achieve impressive results by increasing their digital marketing capabilities, their campaign costs falling by 30% and revenues increasing by 20%. Even when companies use advanced technology and human resources with superior supervision skills, campaign performance can improve by 30%.

The research model to improve the company’s digital marketing capabilities has been established [6]. The model states that a company’s digital marketing capabilities can be improved through the readiness of an innovation ecosystem, adoption of digital marketing technology, and digital transformation.

The innovation ecosystem readiness shows the level of readiness of the company’s innovation ecosystem in responding to changes in the company’s external and internal business environment. Companies that are able to build the innovation ecosystem readiness will tend to have better digital marketing capabilities compared to other companies. The digital marketing adoption shows the level of use of digital marketing technology within the organization. Companies that are able to adopt effective digital marketing technology will tend to have higher levels of digital marketing capabilities. Finally, digital transformation shows the process that companies carry out to integrate technology in their business processes. This process is closely related to leadership capabilities and technological capabilities. Companies that are able to develop digital transformation will tend to have a better level of digital marketing capability than other companies.

The purpose of this study is to calculate and analyze a company’s digital marketing utilization index (DMUI), which is made up of these three components and can be used to evaluate and improve a company’s digital marketing capability. *DMUI* assesses an organization’s ability to use digital marketing to create value for the company by leveraging the innovation ecosystem’s readiness, digital marketing technology, and digital transformation. More specifically, this study will define how the index is calculated, and show how the index results can be used to evaluate and improve the company’s digital marketing capabilities. Figure 1 depicts a summary of the research’s background and objectives.

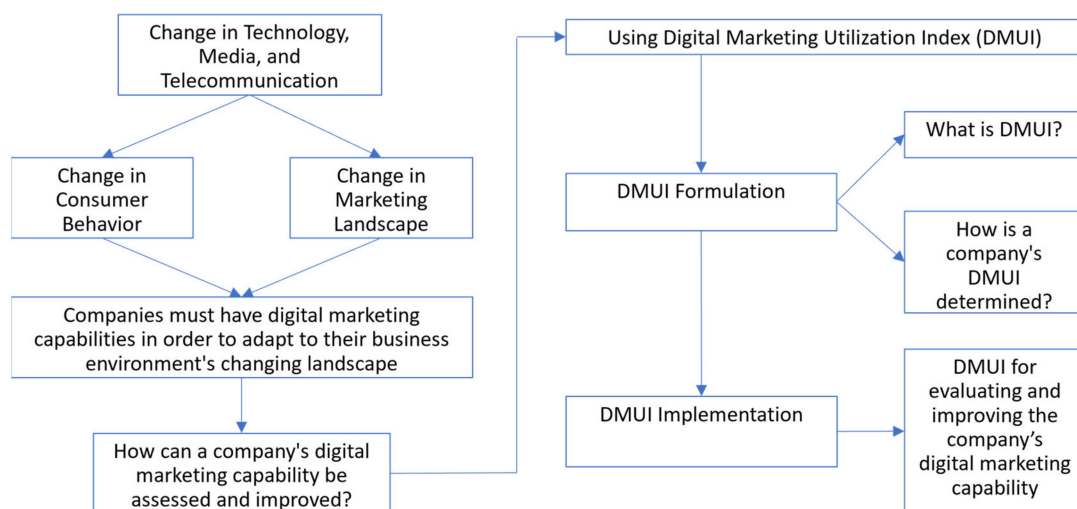


Figure 1. Research purpose.

## 2. Background and Related Studies

This section will present the findings of previous research on digital marketing adoption, digital transformation, and innovation ecosystem readiness factors that can improve the company’s digital marketing capabilities as a constituent component of DMUI, which was developed based on Masrianto’s research [6] as illustrated in Figure 2.

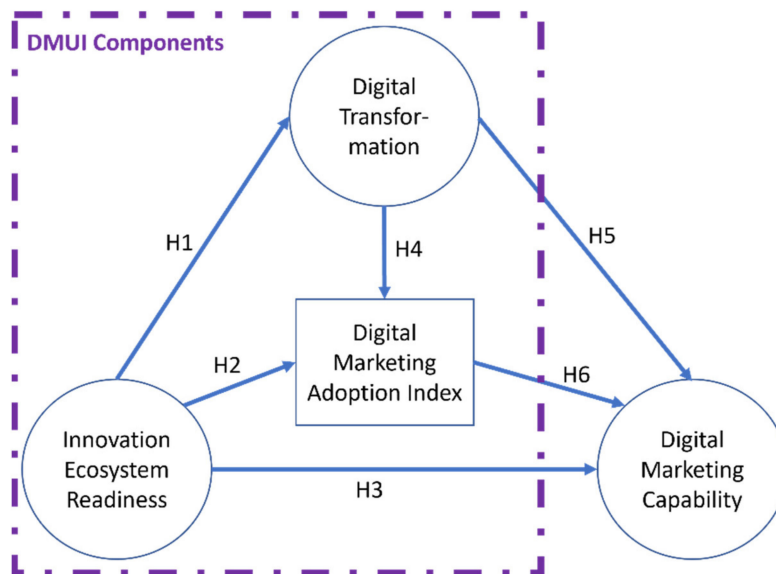


Figure 2. DMUI Components.

### 2.1. Digital Marketing Adoption

Digital marketing is an exciting new concept for many businesses today because it forms a new way of how customers and businesses communicate, share information, and buy and sell with each other [7]. Digital marketing has attracted the attention of marketers [8] because digital marketing facilitates interactions between companies and customers as well as interactions between customers so that emotional and psychological bonds between customers and companies are maintained [9].

Digital marketing is a marketing technique using digital media that can reach consumers at the right time, personally, and is relevant to their needs. Digital marketing is often also referred to as ‘online’, ‘internet marketing’, or ‘web marketing’. The term digital marketing has become the most common term, especially after 2013, along with the growing use of communication and information technology.

According to Gibson [10], as stated by Bala and Verma [11], and Srividhya [12], effective and efficient digital marketing can be achieved by using digital marketing methods and strategies that have a website component and using the internet as a platform to communicate and carry out a variety of derivative strategy activities. The use of digital marketing techniques or methods by companies includes: (1) website, (2) commerce, (3) social media marketing, (4) email marketing, (5) SEO, (6) SEM, (7) digital PR, (8) digital advertising, (9) digital CRM, (10) content marketing, (11) affiliate marketing, (12) online newsletter, (13) display advertising, (14) mobile marketing, and (15) digital analytics.

### 2.2. Digital Transformation

Digital transformation is a process of change that leverages the leverage of technology and digital capabilities to create added value through business models, operational processes, and customer experiences [13]. Therefore, digital transformation aims to improve entities by triggering significant changes in their properties through a combination of information technology, computing, communication, and connectivity [14]. Westerman [15] stated that digital transformation is a process to create a company’s digital competence,

which is determined by seven factors, namely (1) creating an attractive customer experience, (2) utilizing the power of operational processes, (3) finding new business models, (4) developing a transformation vision, (5) involving employees to make the vision a reality, (6) managing the transformation process, and (7) building technology leadership capabilities. All of these factors are a process to create a company's digital competence through the development of digital capabilities and leadership capabilities.

### 2.3. Innovation Ecosystem Readiness

The innovation ecosystem's readiness is a measure of the ecosystem's readiness to adopt innovations developed from the research titled "Firm Technology Adoption Model (F-TAM) among SME's: An Interactive Eco-System Perspective" [16,17]. The study concluded that ecosystem interactions influence the rate of adoption of enterprise innovations. Based on that research [6], the internal and external factors from innovation ecosystem readiness that will influence company digital marketing capability are (1) perceived ease of use, (2) perceived usefulness, (3) managerial innovativeness, (4) organizational readiness, (5) customer need, (6) competitive pressure, (7) innovation infrastructure, (8) opinion leadership, (9) observability, and (10) flexibility.

### 2.4. Digital Marketing Capability

The ability of a company to plan, implement, and manage digital marketing is referred to as its digital marketing capability. It refers to a company's ability to use the internet and other information technologies to facilitate in-depth customer interactions. Through these interactions, customers gain access to company resources and information, while the company learns more about its customers. The processes, structures, and skills that a company needs to succeed in the digital age are also defined as digital marketing capability [3].

Digital marketing capability is a multidimensional construction consisting of three important and complementary resources: IT resources, human resources, and business resources [4]. Furthermore, the level of a company's digital marketing capability is determined by six factors, namely (1) connecting various data sources, both online and offline, to determine target customers and get the perfect picture of customers, (2) build integrated and automation tools such as integrated advertising website and analytics technology, (3) identifying consumer needs in each customer channel, (4) conducting effective collaboration with partners and marketing technology providers, (5) conducting training and upgrading of employee skills and eliminating employee knowledge gaps, and (6) making an adaptable organization [5].

### 2.5. Digital Capability Index

Many studies on digital capability indexes have been conducted in the context of country, industry, company, and society, such as the Technology Readiness Index (TRI), a multiple-item scale to assess people's readiness to interact with technology [18]; Network Readiness Index (NRI), as a major international assessment of countries' capacity to exploit the opportunities offered by ICTs through the pillars of technology, people, governance, and impact [19]; E-Government readiness index, involving website assessment, telecommunication infrastructure, and human resource endowment [20]; Digital Readiness Index (DRI) which measures a country's readiness to achieve a digital economy through seven holistic components such as basic needs, business and government investment, ease of doing business, human capital, start-up environment, technology adoption, and technology infrastructure [21]; Indonesia industry 4.0 readiness index, an industrial readiness index in Indonesia to transform towards industry 4.0, which is formed through five dimensions, namely: people and culture, management and organization, products and services, factory operations, and technology [22]; Digital Readiness Assessment (DRA), digital maturity across seven focus areas: strategy, innovation and growth, customer experience, supply chain and operations, technology, risk and cyber security, finance, legal and tax, people and organization [23]; the Digital Acceleration Index (DAI) uses six dimensions, namely:

targeting and personalization, campaign planning and execution, cross-channel integration, analytics, organizational setup and agency model, and asset production and content strategy [24]; digital marketing maturity assessment tool using RACE framework [25]; and Indonesia's SME Digital Readiness Index (ISDRI), using five dimensions in the assessment to measure how ready a business is to face digital change: people, process, strategy, technology, and integration [26].

Nevertheless, the digital capability index in the context of the company, which specifically discusses the company's digital marketing capabilities based on the pillars of innovation ecosystem readiness, adoption of digital marketing technology, and digital transformation, has never been done, or the index hereinafter referred to as the Digital Marketing Utilization Index (DMUI) had not yet existed. *DMUI* measures an organization's ability to utilize digital marketing to create value for the company through the utilization of the readiness of the innovation ecosystem, digital marketing technology, and digital transformation.

### 3. Materials and Methods

#### 3.1. Data Collection and Sampling

We used 2759 business contacts from an Indonesian national television station that contain information on company owners, directors, general managers, managers, and/or people who play a role in improving the company's marketing performance, from a variety of industries such as food, beverage, smoking, baby products, medicines/pharmaceuticals, toiletries and cosmetics, apparel/personal accessories, household products/supplies, household equipment and appliances, and automobiles. The revenue of Indonesia's TV, radio, and multimedia market from companies operating in Indonesia increased to USD 5.3 billion in 2020. The television segment generated most of this revenue, accounting for over USD 3.8 billion or represents 72% from all media revenue [27]. In that year, there were 777 companies that advertised on national TV in Indonesia. Furthermore, many companies that advertise on television have combined their campaigns with digital media [28]. Based on this, the research sample is expected to represent companies in Indonesia that have the potential to invest in digital transformation.

During the period of July to December 2021, all business contacts were directed to fill out a website containing research questions via email and the WhatsApp application. This study obtained 217 respondents who successfully filled out the questionnaire through the research website using the voluntary sample survey sampling method as a new non-probability sampling design [29].

#### 3.2. Statistical Analysis

In this study, data were analyzed using the PLS-SEM statistical method to determine the weight of each research indicator. According to Hair [30], the PLS-SEM method was chosen because there is a lack of normality in the data distribution and research requires latent variable scores for follow-up analyses. PLS-SEM is a statistical method for understanding, describing, and knowing the role of each accompanying indicator [31]. The number of samples or respondents obtained in this study exceeded the sample size recommendations for PLS-SEM analysis given by Cohen [32] and recommended by Hair [31] on statistical power analysis. When the maximum number of independent variables is six, and a statistical power of 80% is required to detect  $R^2$  of at least 0.10 with a 1% chance of error, a minimum sample of 179 samples is required. A larger sample size will improve the precision of the PLS-SEM coefficient estimation.

Following the first stage of identifying the weights of each indicator using PLS-SEM, the weights were applied to indicators from each latent variable to calculate the innovation ecosystem readiness index and digital transformation index using the max-min procedure [33]. The only manifest variable in this study, the digital marketing adoption index, was weighted using the digital marketing usage index approach by linking digital marketing techniques into web 1.0, web 2.0, web 3.0, and web 4.0 [34]. Web 1.0 was the first stage of the World Wide Web, allowing users to read and search for information. There is no

interaction; Web 2.0 services are user-oriented, leveraging collective intelligence; Web 3.0 identifies and relates Web content in a way that allows machines to understand and derive meaning from the data; and Web 4.0 is a Web that is moving towards artificial intelligence. As a result, personalized agents can collaborate with users to improve the user experience. Based on the characteristics of Web 1.0, Web 2.0, Web 3.0, and Web 4.0 activities, we assigned the following weights to digital marketing indicators with values ranging from 0 (none) to 1 (used): Websites are weighted 1, Email Marketing and Newsletters are weighted 2, Ecommerce, Social Media Marketing, Digital Public Relations, Digital Advertising, and Display Advertising are weighted 3, and the rest are weighted 4. The weights are then converted so that the sum of all indicators equals 1. The third step is to calculate the digital marketing utilization index (DMUI) using the DMUI Index formulation [35].

#### 4. Results

The results of the study will begin with proving the research hypotheses through PLS-SEM analysis, using measurement model testing and structural model testing and model accuracy testing. Then, we proceed with the analysis of the digital marketing utilization index.

The hypotheses to be proven in this study are as follows:

**Hypothesis 1.** *The innovation ecosystem readiness has a significant effect on digital transformation.*

**Hypothesis 2.** *The innovation ecosystem readiness has a significant effect on the digital marketing adoption.*

**Hypothesis 3.** *The innovation ecosystem readiness has a significant effect on digital marketing capability.*

**Hypothesis 4.** *Digital transformation has a significant effect on digital marketing adoption.*

**Hypothesis 5.** *Digital transformation has a significant effect on digital marketing capability.*

**Hypothesis 6.** *Digital marketing adoption has a significant effect on digital marketing capability.*

PLS-SEM tests and estimates whether the collected data can explain the causal relationships that occur in the model. The quality of the PLS-SEM result model will be explained by evaluating measurement models and structural models. The testing of the measurement model will refer to the results of empirical measurements about the relationship between the indicators and their constructs (variables), whereas the testing of the structural model will explain the relationship between the constructs.

Table 1 presents a summary of the PLS-SEM model's test results in the study. The obtained standardized root mean square residual (SRMR) = 0.067 value in this study indicates a good fit model because the SRMR value is less than 0.08, indicating that it has met the fit evaluation model's criteria. Standardized root mean square residual is a model fit measure, which is defined as the root mean square discrepancy between the observed correlations and the model-implied correlations. Because the SRMR is an absolute measure of fit, a value of zero indicates perfect fit [31].

Furthermore, the summary of PLS-SEM evaluations table displays the values of internal consistency reliability, convergent validity, discriminant validity, collinearity, path coefficient size and significance, outer loading size and significance, and coefficient of determination, all of which are test criteria for reflective measurement models and structural measurement models.

**Table 1.** Summary of PLS-SEM evaluations.

Evaluation	Criteria	Output	Results
<b>Step 1: Evaluation of the Reflective Measurement Model</b>			
1. Internal consistency reliability	a. Cronbach’s Alpha = 0.6–0.9 or less than 0.95	0.89–0.905	Supported
	b. Composite reliability > 0.70	0.915–0.921	Supported
2. Convergent validity	a. Outer loading > 0.708	0.574–0.848	Supported
	b. Average Variance Extracted (AVE) >0.5	0.544–0.624	Supported
3. Discriminant validity	Heterotrait-Monotrait Ratio (HTMT) < 0.90	0.371–0.894	Supported
<b>Step 2: Evaluation of the Structural Model</b>			
1. Collinearity	Variance Inflation Factor (VIF) = 0.20–5	1.227–2.615	Supported
2. Size and significance of path coefficients	p-values < 0.05	p-values < 0.05	Supported
3. Coefficients of Determination (R <sup>2</sup> )	Weak = 0.25–0.50, moderate = 0.5–0.75, strong > 0.75	0.185–0.695	Weak and moderate category
<b>Step 3: Model fit Evaluation</b>			
Standardized root mean square residual (SRMR)	SRMR < 0.08	0.067	Supported

#### 4.1. Evaluation of Reflective Measurement Model

Based on Table 1, it is possible to conclude that all test components for the evaluation of reflective models produce results that support this study. This is evident from the values of internal consistency reliability, convergent validity, and discriminate validity that met the test criteria.

All indicators in the study demonstrated the significance and relevance of outer loading in each research construct. The results show that the weights of all indicators in each construct are significantly different from zero, as evidenced by a *p* value less than 0.05, as shown in Table 2.

Organizational readiness is the most important indicator for the construct of innovation ecosystem readiness (question: Our company is prepared to implement digital marketing innovation). Meanwhile, the most important indicator for the digital transformation construct is improved operations (question: Our company’s technological innovations have enabled customers to interact with our operational processes in new ways). Based on these indicators, we can conclude that the innovation ecosystem readiness is largely determined by the organization’s readiness, which refers to whether the organization’s resources, structures, systems, culture, skills, and strategies are ready to adopt digital marketing innovations. Digital transformation is largely determined by a company’s ability to exploit its core operational strengths, which means that companies can look for bottlenecks and inefficiencies in their business processes and can consider and apply digital technologies to help achieve better business processes.

In general, indicators with outer loading values less than 0.4 can be immediately eliminated from the model, while values between 0.40–0.70 can be removed from the measurement model if and only if the result of its removal increases its composite reliability value [31]. The results of this study show that some indicators have an outer loading value between 0.4 and 0.7, indicating that it is necessary to consider including or eliminating the indicator in each of the accompanying constructs. The technology leadership indicators in the digital transformation construct with an outer loading value of 0.688 are some indicators that must be considered for inclusion or elimination from the accompanying construct. Furthermore, indicators of observability, opinion leadership, competitive pressure, and innovation infrastructure with outer loading values of 0.685, 0.610, 0.590, and 0.574 in the innovation ecosystem readiness construct should also be reconsidered.

**Table 2.** PLS-SEM Results: size and significance of outer loading.

Items and Constructs <sup>1</sup>	Outer Loading	T Statistics	p Values
<b><i>Innovation Ecosystem Readiness</i></b>			
Employees of our company find it simple to implement digital marketing innovations (Perceived ease of use).	0.779	24.145	0.000
Digital marketing innovations benefit our employees’ work (Perceived usefulness).	0.815	27.153	0.000
Our company is prepared to implement digital marketing innovation (Organizational readiness).	0.842	38.648	0.000
Our company’s management is actively introducing digital marketing innovation (Managerial innovativeness).	0.834	34.101	0.000
Our customers are already using digital marketing innovations (Need of customer).	0.590	20.131	0.000
Our competitors will be superior if we don’t implement digital marketing innovation (Competitive pressure).	0.748	10.665	0.000
The government has built sufficient infrastructure to support the implementation of digital marketing innovation in Indonesia (Innovation infrastructure).	0.574	11.048	0.000
In general, opinion leaders and the media very often talk about digital marketing innovation (Opinion leadership).	0.610	12.086	0.000
Digital marketing innovation is easy to implement in our business processes (Flexibility).	0.825	29.340	0.000
It is very easy to distinguish how marketing works digital with conventional marketing (Observability).	0.685	16.191	0.000
<b><i>Digital Transformation</i></b>			
Our company uses digital channels (such as online, social media, and mobile) to market its products and services (Customer experience).	0.723	18.755	0.000
Our company’s technological innovations have enabled customers to interact with our operational processes in the new ways (Improving operation).	0.843	35.629	0.000
Our company has launched a new business model based on/ using digital technology (Reinvention of business model).	0.808	30.292	0.000
Our management has a vision to digitally transform our company’s for the future (Digital vision).	0.736	19.060	0.000
Company promotes the cultural changes necessary for digital transformation (Engaging the organization).	0.797	18.033	0.000
Our company defines it by clear roles and responsibilities between departments to carry out digital initiatives (Governing the transformation).	0.838	34.731	0.000
Information technology unit performance has been able to meet the company’s need to digitally transform digital (Technology leadership).	0.688	14.460	0.000
<b><i>Digital Marketing Adoption</i></b>			
Does your company use the following digital marketing techniques and methods? (values ranged from 0 (inexistent) to 1 (used)).	1.000		

<sup>1</sup> Indicators were developed from Gibson [10], Bala [11], Srividhya [12], Westerman [15], Doe [16,17], and Chaffey [3].

In relation to the indicators mentioned above, we reanalyzed the PLS-SEM model, a modified model, by eliminating indicators with values ranging from 0.4 to 0.7, and then compared the reliability value of the new composite to the reliability value of the old composite. According to the comparison of composite reliability values in Table 3, removing such indicators has no effect on the composite reliability value. As a result, it can be determined that there are insufficient compelling reasons to remove such indicators from the original model, because doing so will change the validity of the accompanying construct’s content while not increasing the composite reliability (CR).



**Table 3.** Old and new composite reliability value.

Variable	Old CR	New CR	Cronbach Alpha	AVE
Innovation ecosystem readiness	0.921	0.928	0.905	0.544
Digital transformation	0.915	0.913	0.890	0.606
Digital marketing adoption index <sup>1</sup>	1.000	1.000	1.000	1.000
Digital marketing capability	0.920	0.913	0.899	0.624

<sup>1</sup> The manifest variable.

This study demonstrated a high degree of reliability of internal consistency of all research variables, as indicated by a Cronbach’s alpha value greater than 0.89 and a composite reliability value greater than 0.90 but less than 0.95, indicating that the indicators in this study’s questionnaire can be relied on to measure the same in a construct. Furthermore, this study has a good convergent validity, as evidenced by an AVE value greater than 0.50, indicating that the construct of this study explained more than 50% of the diversity contained in the research indicators. The digital marketing adoption index variable, as the only manifest variable in the study, has a value of one for CR, Cronbach’s alpha, and AVE. This is understandable given that the digital marketing adoption index only has one response value. The HTMT value is also between 0.371 and 0.894, which is less than 0.90. This means that, based on these indicators, each construct has demonstrated good discriminant validity, or that each variable has its own uniqueness. Table 4 shows the specific discriminant validity results for each variable.

**Table 4.** Heterotrait-Monotrait Ratio (HTMT).

Variable	DMA	IER	DMC	DT
Digital marketing adoption index (DMA) <sup>1</sup>				
Innovation ecosystem readiness (IER)	0.371			
Digital marketing capability (DMC)	0.486	0.790		
Digital Transformation (DT)	0.446	0.834	0.894	

<sup>1</sup> The manifest variable.

#### 4.2. Evaluation of Structural Model

Based on Table 1, it is possible to conclude that all test components for the evaluation of structural models produced results that support this study. This is evident from the values of collinearity, coefficients of determination, and significance of path coefficients that met the test criteria. This study’s average VIF value is less than 3, indicating that there is no collinearity between constructs and that measurement bias for the path coefficient can be avoided.

Each relationship in the structural model also has a significant influence on improving the company’s digital marketing capabilities. Table 5 displays the size and significance of path coefficients in the structural model for each relationship while answering various hypotheses in Masrianto’s previous study [6]. The innovation ecosystem readiness has a significant positive effect on the company’s digital marketing capabilities (H3:  $\beta = 0.259$ ;  $p$ -value < 0.05), as does digital transformation (H5:  $\beta = 0.555$ ;  $p$ -value < 0.05), and digital marketing adoption (H6:  $\beta = 0.125$ ;  $p$ -value < 0.05). The findings of this hypothesis test support the author’s contention that innovation ecosystem readiness, digital transformation, and digital marketing as components of *DMUI* are factors that can significantly improve a company’s digital marketing capabilities.

**Table 5.** PLS-SEM results: size and significance of path coefficients.

Hypothesis <sup>1</sup>	Path Coefficients	T Statistics	p Values	Results
H1	0.772	24.719	0.000	Supported
H2	0.114	0.999	0.318	Not supported
H3	0.259	3.440	0.001	Supported
H4	0.336	3.102	0.002	Supported
H5	0.555	7.405	0.000	Supported
H6	0.125	3.015	0.003	Supported

<sup>1</sup> The hypothesis was developed from Masrianto’s research [6].

Other hypothesis test results show that the innovation ecosystem readiness has a direct influence on digital transformation (H1:  $\beta = 0.772$ ;  $p$ -value < 0.05), as well as digital transformation having a direct influence on the digital marketing adoption (H4:  $\beta = 0.336$ ;  $p$ -value < 0.05). The findings of this study are fascinating in that the innovation ecosystem readiness has no direct effect on digital marketing adoption (H2:  $\beta = 0.114$ ;  $p$ -value > 0.05). Companies with a well-prepared innovation ecosystem readiness do not adopt digital marketing before undergoing digital transformation; they understand that good digital marketing capabilities will never be achieved without undergoing digital transformation.

The coefficient of determination  $R^2$  shows a value of 0.695 for digital marketing capabilities, which means that the explanatory power of the model is relatively moderate. Hair [35] states that the value of  $R^2$  which is between 0.50–0.75 indicates that endogenous variables can be explained by exogenous variables with a moderate degree of determination.

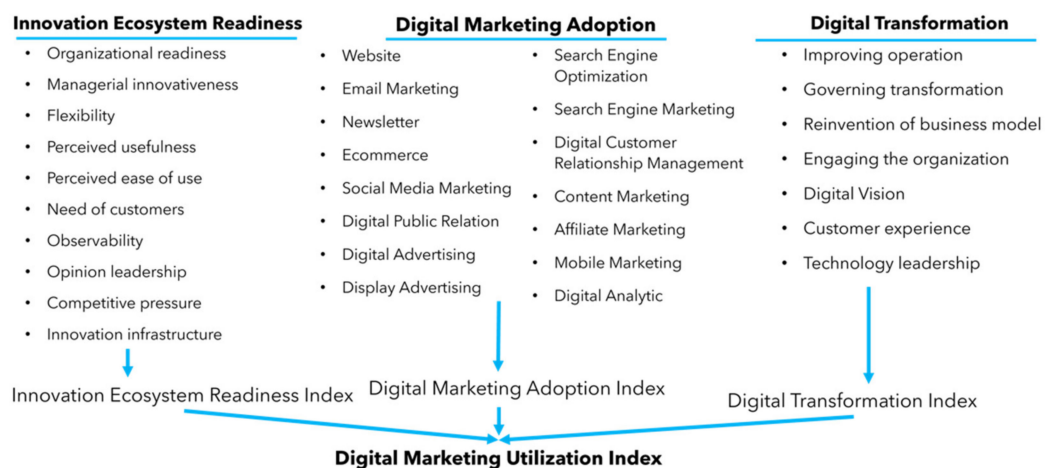
#### 4.3. DMUI Formulation

The Digital Marketing Utilization Index (DMUI) is introduced in this study to measure the level of digital marketing utilization by companies using three aspects of increasing digital marketing capabilities, namely: innovation ecosystem readiness, digital transformation, and adoption of digital marketing. Three aspects of increasing the company’s digital marketing stem from the company digital marketing capability improvement model [6].

As previously stated, digital marketing capabilities are focused on strategy rather than technology. The three fundamental aspects of improving digital marketing capabilities discussed in this study are inextricably linked to the relationship between digital marketing planning, implementation, and management. Companies can identify the factors that contribute to high and low levels of digital marketing capabilities, allowing them to take corrective actions to improve their digital marketing capabilities immediately. DMUI is presented to meet that requirement.

The 32 indicators used to calculate the digital marketing utilization index were derived from 10 indicators indicating innovation ecosystem readiness, 15 indicators indicating digital marketing adoption, and 7 indicators indicating digital transformation, as shown in Figure 3. The DMUI is a composite index that measures three aspects of a company’s digital marketing capability.

The first step in calculating the DMUI is to create three separate indices for each dimension. These index dimensions (one for innovation ecosystem readiness, one for digital marketing adoption, and one for digital transformation) are then used to calculate total DMUI using geometric means. The loading factor of each significant indicator produced by PLS-SEM is used to analyze the index value of each variable, such as the innovation ecosystem readiness index, digital transformation index, and digital marketing capabilities index. The loading factor determines an indicator’s absolute contribution to a construct [31]. The absolute contribution of each reflective model indicator then becomes the weight of the items to produce the variable score. Furthermore, for weighted digital marketing adoption indicators, the digital marketing usage index approach is used [34]. The max-min procedure is then used to convert each score on each of these dimensions into an index score with a distribution of values ranging from 0 to 100.



**Figure 3.** Components and sub-components of the DMUI.

The basic formula for converting the indicator score value ( $V$ ) into an index score ( $I$ ) is [33]:

$$I = 100 \times \frac{V - \text{min\_value}}{\text{max\_value} - \text{min\_value}} \tag{1}$$

where  $\text{min\_value}$  is the lowest possible score value (lower bound) and  $\text{max\_value}$  is the highest possible score value (upper bound).

The second step is to compute the total *DMUI*, which is the result of multiplying the three indices and then calculating the geometric mean to produce the final number of the *DMUI*.

The formula for calculating *DMUI* is:

$$DMUI = \sqrt[3]{I_I \times I_D \times I_A} \tag{2}$$

where  $I_I$  is the innovation ecosystem readiness index,  $I_D$  is the digital transformation index, and  $I_A$  is the adoption for digital marketing index.

#### 4.3.1. Innovation Ecosystem Readiness Index

The index of innovation ecosystem readiness is derived from the exogenous latent variable of innovation ecosystem readiness as measured by indicators that characterize the ecosystem’s readiness to use digital marketing innovation. The innovation ecosystem’s readiness is measured using ten main indicators derived from the five dimensions of the ecosystem that interact with one another, namely employee perceptions and attitudes, internal characteristics, and external characteristics, the industry’s characteristics, the country’s and society’s characteristics, and the characteristics of digital marketing technology. Based on the results of the PLS-SEM weighting, we applied the following to each indicator: organizational readiness and managerial innovativeness were weighted at 0.12; perceived ease of use, perceived usefulness, and flexibility were weighted at 0.11; customer need was weighted at 0.10; observability was weighted at 0.09; and the remaining competitive pressure, innovation infrastructure, and opinion leadership were weighted at 0.08.

The indicators of innovation ecosystem readiness were measured using a Likert scale with values ranging from 1 (strongly disagree) to 5 (strongly agree). The total innovation ecosystem readiness score was then computed by weighting each of its indicators. Furthermore, a maximum-minimum procedure was used to convert the total innovation ecosystem readiness score into a 0–100 score index.

The value of the innovation ecosystem readiness index was obtained from all companies in Indonesia included in this study based on the above-mentioned score index calculation steps demonstrating that the score index value ranges from 33 to 100. As many as 25% of companies have an innovation ecosystem readiness score index value of less than

67, and 50% have a score index value of less or more than 78, and the remaining 25% have a score index value of greater than 92.

#### 4.3.2. Company Digital Transformation Index

The index of digital transformation is derived from the endogenous latent variable of digital transformation as measured by indicators that characterize company digital transformation. The digital transformation is measured using seven main indicators derived from the two dimensions of the digital transformation that interact with one another, namely building digital capabilities and building leadership capabilities. Based on the results of the PLS-SEM weighting, we applied the following to each indicator: improving operation, reinvention of business model, engaging the organization, and governing the transformation were weighted at 0.15; digital vision was weighted at 0.14, and the remaining customer experience and technology leadership were weighted at 0.13.

The indicators of digital transformation were measured using a Likert scale with values ranging from 1 (strongly disagree) to 5 (strongly agree). The total digital transformation score was then computed by weighting each of its indicators. Furthermore, a maximum-minimum procedure was used to convert the total digital transformation score into a 0–100 score index.

The value of the digital transformation index was obtained from all companies in Indonesia included in this study using the above-mentioned score index calculation steps demonstrating that the score index value ranges from 14 to 100. As many as 25% of companies have a digital transformation score index value of less than 61, 50% have a score index value of less or more than 75, and the remaining 25% have a score index value of greater than 93.

#### 4.3.3. Company Digital Marketing Adoption Index

Digital marketing adoption is measured using fifteen main indicators derived from the digital marketing techniques that use by companies, namely (1) website, (2) eCommerce, (3) social media marketing, (4) email marketing, (5) SEO, (6) SEM, (7) digital PR, (8) digital advertising, (9) digital CRM, (10) content marketing, (11) affiliate marketing, (12) online newsletter, (13) display advertising, (14) mobile marketing, and (15) digital analytics. To each indicator, we applied the digital marketing usage index approach [36] as follows: content marketing was weighted at 0.09; search engine optimization, search engine marketing, social media marketing, affiliate marketing, mobile marketing, digital analytics, and digital customer relationship management were weighted at 0.08; digital advertising, digital public relations, display advertising, and eCommerce were weighted at 0.06; email marketing was weighted at 0.05; newsletter was weighted at 0.04, and the remaining website was weighted at 0.02.

The indicators of digital marketing adoption were measured using binary data with values ranging from 0 (do not use) to 1 (use). The total digital marketing adoption score was then computed by weighting each of its indicators. Furthermore, a maximum-minimum procedure was used to convert the total digital marketing adoption score into a 0–100 score index.

The value of the digital marketing adoption index was obtained from all companies in Indonesia included in this study using the above-mentioned score index calculation steps demonstrating that the score index value ranges from 0 to 100. As many as 25% of companies have a digital marketing adoption score index value of less than 49.5, 50% have a score index value of less or more than 74, and the remaining 25% have a score index value of greater than 91.

After the three indexes in the *DMUI* component are calculated, the *DMUI* value for each company can be calculated using Formula (2), which has been presented previously. The value of the digital marketing utilization index was obtained from all companies in Indonesia included in this study using the above-mentioned *DMUI* score index calculation steps demonstrating that the score index value ranges from 27 to 100. As many as 25% of

companies have a digital transformation score index value of less than 60, 50% have a score index value of less or more than 74, and the remaining 25% have a score index value of greater than 84.

Based on the results of the above company grouping, further investigation of the components that comprise *DMUI* was conducted, specifically by comparing the average index score in each group of companies. According to Table 6, companies with a low category of digital marketing utilization index will also have a low level of innovation ecosystems readiness, digital transformation, and digital marketing adoption. Similarly, companies with a high category of digital marketing utilization index are more prepared for innovation ecosystem readiness, digital transformation, and digital marketing adoption.

**Table 6.** The average index score for each company classification in Indonesia.

Components <sup>1</sup>	Low	Medium	High
Innovation ecosystem readiness index	65	78	91
Digital transformation index	56	75	92
Digital marketing adoption index	51	72	81
Digital marketing utilization index	55	74	86

<sup>1</sup> The digital marketing utilization index and its constituent components.

#### 4.4. *DMUI Implementation (Case Study from Companies in Food and Beverage, Property, and Online Product Industry Sectors)*

The preceding discussion described how the index score is calculated. This study generates a *DMUI* index score calculator that is useful for identifying the level of use of digital marketing by companies, predicting the level of the company’s digital marketing capabilities, and then parsing the causes of the company’s high and low levels of digital marketing capabilities to identify things that the company must improve to improve its digital marketing capabilities.

The following is an example of questionnaire responses from three companies obtained in this study. As a mark of respect for research ethics, we do not display the company name, instead using the symbols A, B, and C. Companies A, B, and C are in the beverage, real estate, and online product industries, respectively. These companies wanted to know their current level of digital marketing capabilities and what factors they need to improve their digital marketing capabilities. Each company completed a questionnaire, which was represented by its management team, and the results are shown in Table 7.

Based on the questionnaire responses provided by company A’s management, it can be calculated and identified that company A’s digital marketing capability index is 61, with a digital marketing utilization index of 44. Company A’s digital marketing capability index and digital marketing utilization index are classified as low category because their  $DMUI = 44$  ( $DMUI < 60$ ).

According to the *DMUI* index score calculator, the low level of company A’s digital marketing capability is due to the low utilization of digital marketing, particularly in the aspects of ecosystem readiness (index value = 51), digital transformation (index value = 49), and digital marketing adoption (index value = 35). In this example, it can be concluded that company A is not adept at managing every aspect of its digital marketing capabilities. As a first step, we can suggest to company A that it immediately begins to build the readiness of the innovation ecosystem by focusing on aspects of managerial innovativeness, organizational readiness, and perceived usefulness.

**Table 7.** Digital Marketing Utilization index score calculator.

Variables	Indicators	Companies			Variables	Indicators	Companies						
		A	B	C			A	B	C				
Innovation Ecosystem Readiness					Digital Marketing Adoption								
1	Perceived ease of use	4	3	5	1	Website	0	1	1				
2	Perceived usefulness	3	4	5	2	Email marketing	0	1	1				
3	Organizational readiness	2	4	5	3	Newsletter	0	1	1				
4	Managerial innovativeness	2	4	5	4	Ecommerce	1	1	1				
5	Need of customer	3	3	5	5	Social media marketing	1	1	1				
6	Competitive pressure	4	4	5	6	Digital public relation	0	1	1				
7	Innovation infrastructure	3	4	5	7	Digital advertising	1	1	1				
8	Opinion leadership	3	3	5	8	Display advertising	1	1	1				
9	Flexibility	3	4	5	9	Search engine optimization	0	1	1				
10	Observability	4	4	5	10	Search engine marketing	0	1	1				
Digital Transformation					11	Digital CRM	0	1	1				
					12	Content marketing	1	1	1				
					13	Affiliate marketing	0	1	1				
					14	Mobile marketing	0	1	1				
					15	Digital analytic	0	1	1				
					1	Customer experience	4	4	5	Index Score Calculation Results <sup>1</sup>			Index Score
					2	Improving operation	2	4	5	Digital Marketing Utilization Index (DMUI)			
3	Reinvention of business model	2	4	5									
4	Digital vision	4	3	5		44	77	100					
5	Engaging the organization	3	3	5	a.	Innovation Ecosystem Readiness Index	51	68	100				
6	Governing the transformation	3	4	5	b.	Digital Transformation Index	49	68	100				
7	Technology leadership	3	4	5	c.	Digital Marketing Adoption Index	35	100	100				

<sup>1</sup> Results of questionnaire response and index score calculation for companies A, B, and C.

The second example is company B, through the same questions and procedures as the example company A, it can be calculated that the digital marketing capability index of company B is 64, with a digital marketing utilization index of 77. The value of the digital marketing capability index and the digital marketing utilization index of company B is classified as medium category because their  $DMUI = 64$  (DMUI between 60–84).

According to the *DMUI* index score calculator, the medium level of company B’s digital marketing capability is due to the low of utilization of digital marketing, particularly in the aspect of ecosystem readiness (index value = 68) and digital transformation index value = 68). In this example, it is possible to conclude that company B has been very successful in implementing digital marketing techniques and methods (index value = 100), but aspects of ecosystem readiness and digital transformation still need to be improved. As a next step, we can suggest to company B that it begins developing digital transformation immediately by focusing the company’s attention on the aspects of proper transformation governance (governing the transformation) and efforts to find new business models (reinvention of business models).

The last example is company C. The digital marketing capability index of company C is 100, with a digital marketing utilization index of 100 as well. The value of the digital

marketing capability index and the digital marketing utilization index of company C is classified as high category (very good) because their  $DMUI > 84$ .

According to the  $DMUI$  index score calculator, the high level of company C's digital marketing capability is due to the high of the utilization of digital marketing in all aspect of its digital marketing capabilities. In this example, it can be concluded that company C has been classified as very good at managing every aspect that can improve its digital marketing capabilities.

## 5. Discussion

### *Discussion on Empirical Findings*

This study discovered that digital transformation has a direct effect on digital marketing adoption as well as digital marketing capabilities, but similar findings have been found in other studies [36,37]. Furthermore, contrary to previous research [16,17,38], the readiness of the innovation ecosystem has no direct impact on digital marketing adoption. The readiness of the company's innovation ecosystem does not guarantee the adoption of digital marketing, but it does provide more awareness to companies to carry out digital transformation so that companies can choose digital marketing adoption methods that are more in line with the company's business processes. As a result, the role of digital transformation in mediating the readiness of the innovation ecosystem and the adoption of digital marketing will be critical.

This study was able to formulate and implement a digital marketing utilization index for evaluating and improving company digital marketing capability.  $DMUI$  can be created by combining the innovation ecosystem readiness index, digital transformation index, and digital marketing adoption index. Based on this research, all of these variables have a direct impact on company digital marketing capability. It also categorizes companies in Indonesia into three categories: low, medium, and high  $DMUI$ . Companies in the low category have a low level of innovation ecosystem readiness, a low level of digital transformation, and a low level of digital marketing adoption, and vice versa.

This study also identified and presented practical ways to improve a company's digital marketing capabilities. The  $DMUI$  index score calculator can calculate and then identify a company's level of digital marketing capabilities. This  $DMUI$  calculator can also show the factors that contribute to the company's digital marketing capability levels. This will undoubtedly help the company identify and understand its flaws, allowing it to take corrective action.  $DMUI$  differs from existing digital capability indices in that it involves the adoption and techniques of digital marketing as a whole, and links them to digital transformation and ecosystem readiness.

## 6. Contribution

### *6.1. Theoretical Contribution*

This study adds significantly to the marketing and digital literature. We were able to demonstrate that digital marketing capability can be developed by combining the innovation ecosystem readiness index, digital transformation, and digital marketing adoption. There is currently no model that describes how companies develop their digital marketing capabilities by simultaneously identifying the three indices. The majority of digital capability indexes created are technology-focused rather than digital-marketing-focused. Our findings highlight the significance of integrating innovation ecosystem readiness, digital transformation, and digital marketing adoption in order to maximize the power of a company's digital marketing capabilities in order to win business competition.

This finding is consistent with previous research on business strategy approaches such as dynamic capability [33] and the resources-based view [39]. A dynamic capability view-based business strategy approach is related to the company's ability to integrate, build, and reconfigure internal and external competencies in order to deal with the rapidly changing business environment. We discovered that digital transformation, or the implementation of dynamic capability, plays the most important role in increasing digital marketing capabilities.

The resource advantage-based business strategy approach emphasizes that a company's competitive advantage is formed when it has unique and difficult to imitate resources. We discover that digital marketing adoption, which is the implementation of a resources-based view, has the smallest contribution to the company's digital marketing capabilities.

An important implication of this finding is that, while digital marketing adoption is widely recommended by researchers such as Gibson [10], Bala and Verma [11], and Srividhya [12], companies will gain a competitive advantage only if digital marketing adoption is combined with digital transformation and ecosystem readiness. A resource-based business strategy approach, in other words, must be linked to a dynamic capability-based business strategy [40].

## 6.2. Managerial Contribution

Although the company's digital marketing capabilities can be attained through one of the channels of digital marketing adoption, digital transformation, or innovation ecosystem readiness, digital marketing is more than just technology adoption; it is also about strategies to integrate technology into business processes. Digital transformation is the primary driver of increased digital marketing capabilities. Companies can increase the role of managerial innovativeness, organizational readiness, and perceived usefulness to improve their innovation ecosystem readiness. Furthermore, businesses must govern the transformation and reinvention of new business models to carry out digital transformation. Finally, in addition to implementing digital marketing through websites, social media, mobile marketing, and content marketing, the company must emphasize the importance of digital analytics, digital CRM, digital advertising, and display advertising. As a result, the following are some managerial implications that can improve DMUI:

1. Companies must prioritize digital marketing in their organizational strategies. As a result, businesses must align their digital strategies with their organizational and marketing strategies. Companies must establish organizational goals, marketing goals, and digital marketing goals in order to properly plan digital marketing budgeting to achieve return on investment.
2. Companies must create an organizational structure to support digital marketing operations. As a result, the company may think about changing or creating a new structure by integrating the marketing team, information technology team, and other teams, or by utilizing cross-functional teams. Furthermore, if the company's internal resources are insufficient, it can consider outsourcing options.
3. Companies must create processes, procedures, and/or information systems to support digital marketing. As a result, they must have systems in place to manage the quality of digital marketing content, manage customer information, plan and report on digital marketing effectiveness, and have integrated technology solutions from both internal and external sources.
4. Companies must identify the characteristics of their human resources, which tend to be marketing and information technology savvy. As a result, the company must improve the skills of the digital marketing team through employee development and training in order to increase employee knowledge and skills about digital marketing and increase management involvement in digital marketing.
5. Companies must have an organizational style and culture that guides collective behavior by key managers in achieving organizational goals and digital marketing goals, so that digital marketing can become a common goal to be achieved by the company. This culture must be owned by the company in order to align internal and external perceptions of various goals.

## 7. Conclusions

The *DMUI* index assesses how businesses use digital marketing. The measurement includes not only digital marketing technology adoption, but also digital transformation and innovation ecosystem readiness. *DMUI* can assess a company's digital marketing



capabilities and determine the root causes of high and low digital marketing capabilities, allowing *DMUI* to make recommendations on how to improve the company's digital marketing capabilities.

This study employs a sample of companies from a variety of industry sectors and does not employ probability sampling. In future research, more examples of companies in the same industry category should be studied so that the discussion per industry category in which the company does business becomes more in-depth. As a result, it will be very interesting to dig deeper into why each industry has such disparities in digital marketing capabilities.

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