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The Effect Of Application Of Blockchain Technology On Digital Marketing

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A R T I C L E I N F O

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Blockchain
Big Data
Digital Marketing

A B S T R A C T

This study aims to analyze 1) Does blockchain have a positive and significant effect on the use of big data?, 2) Does big data have a positive and significant effect on digital marketing?, 3) Does blockchain have a positive and significant effect on the future of digital marketing? This study uses survey method, and in data collection, online questionnaires were used and distributed to people who understand about the concept of blockchain technology and digital marketing. The sampling method of this research is purposive sampling with the number of samples is 118 people. The approach used is Partial Least Square-Structural Equation Modelling, using the Smart PLS 3.0 Program. The results showed that 1) Blockchain has a positive and significant effect on big data, 2) Big data has a positive and significant effect on digital marketing, 3) Blockhain has a positive and significant effect on digital marketing.

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1. Introduction

Technology according to the Big Indonesian Dictionary, has a definition as a scientific method to achieve a practical goal. Technology also has a meaning as a means or facility, to provide goods needed for the survival and comfort of human life. The development of technology is getting faster, initially the technology used by humans is only limited to the use of machines and heavy equipment to help work, while nowadays all aspects of life are associated with technology. The evolution of technology has an impact on the marketing process, and currently marketing uses a lot of information technology assistance. Digital marketing, reported in wartaekonomi.co.id (2020), emerged in the 1990s, in line with the invention of the world wide web.

Technology does not only have an effect on marketing, but also in the payment process. Currently, people can use technology to process payments using their smartphones. The transaction process still relies on the original currency, but there are also currencies that rely solely on technology completely, namely digital currency or what is now known as crypto currency.

Crypto currency first appeared in the 1990s, but many failed, until in 2009 a digital currency called bitcoin appeared (CNN Indonesia, 2021). Bitcoin itself uses blockchain technology in its application to process transactions, which do not use third parties in the process, so it is directly peer-to-peer. The concept of the block chain itself, which was originally only applied to bitcoin, is felt to be applicable in various other fields, not just digital currency. Blockchain itself is a ledger and is interconnected with one another, so it is called a blockchain. . Blockchain itself is distributed evenly and peer-to-peer, so it is considered safe to record a transaction, and also transaction data can be accessed by everyone transparently, as well as anonymously (Iredale, 2020)

Blockchain technology is predicted to have an important role in digital marketing in the future. Reported in semupdates.com (2019), of the 20 digital marketing trends that are and will go viral in 2020, one of them is blockchain technology in search engine advertising. The use of blockchain

technology is much broader than just the financial world which can be applied in the world of digital marketing because its functions are transparent and provide benefits for the branding process.

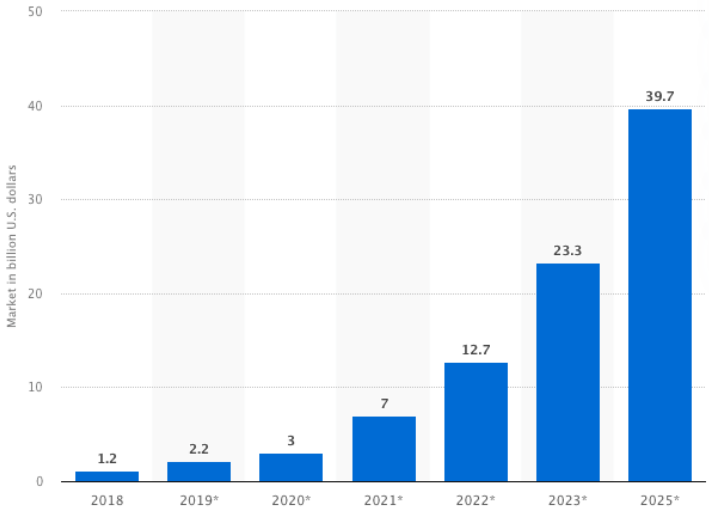

Figure 1 Blockchain Technology Market Size Worldwide
Source: Statista (2021)

Figure 1 above shows the size of the blockchain technology market around the world from 2018 to 2025, where it is predicted that by 2025, the blockchain technology market will have a size of $39.7 billion. The graph shows the predictions of the blockchain market which also shows the adoption of the use of blockchain technology. With this in mind, this research aims to find out : 1) Does blockchain have a positive and significant effect on the use of big data?, 2) Does big data have a positive and significant effect on digital marketing?, 3) Does blockchain have a positive and significant effect on the future of digital marketing?

This study is a modification of existing research which was investigated by Brauer and Eriksson (2020) with the title of **Blockchain's Influence on Digital Marketing**.

2. Literature Review and Hypotheses Development

A. The Relationship between Blockchain and Big Data

Blockchain according to Wijaya and Darmawan (2017) has a definition as a DBMS or Data Base Management System, but it is not just an ordinary DBMS but has advantages, in which the data and all the information in it is protected and cannot be changed. In a Blockchain network, there is no single entity or single authorized party that controls or owns the ledger. The blockchain network does not rely on trusted institutions, but the blockchain network relies on a trusted digital environment (Al-Ahwal, 2021). The results of Polyviuo,Velanas and Soldatos (2019) shows that blockchain has a positive influence on big data. Brauer and Eriksson (2020); Karafiloski and Mishev (2011) shows that blockchain technologi has a positive impact on big data. With this, it is shown that the first hypothesis of this study is:

H1: Blockchain has a positive and significant effect on big data

B. The Relationship between Big Data and Digital Marketing

Big data has a definition as data that is still raw, where the data can be analyzed in real time even in large volumes (Sofia, Sekar Puji, Fauziah & Raya, 2019). Russom (2011) in Sutandi (2018) says that Big Data Analytics or BDA is a technology that has the aim of storing, converting, transferring and also analyzing large amounts of data that are continuously updated, have variations, and can also be

structured or structured. unstructured, and all for social and commercial gain. The research conducted by Brahimi (2020); Grishikashvili, Dibb and Meadows (2014); Rejeb, Rejeb and Keogh (2020) shows that big data has a positive influence on digital marketing., and big data is a promising technology to influence digital marketing. This shows the second hypothesis is:

H2: Big data has a positive and significant effect on digital marketing.

C. The Relationship between Blockchain and Digital Marketing

Burns, Daughterty and Eastin (2011) say that digital marketing itself has a definition as the use of digital media and the internet for marketing purposes of a business or organization. Digital marketing that is carried out through the internet is believed to be one of the best solutions in overcoming various problems that can be faced in the marketing world. It can be concluded that digital marketing is a company process that uses various internet media to process its marketing activities. Internet media used by companies can be in various forms, such as blogs, websites, email, and also social media (Sanjaya & Tarigan, 2009). The relationship between blockchain and digital marketing shows a positive results in previous research, where blockchain has a positive influence on digital marketing (Brauer & Eriksson, 2020); (Ertemel, 2018); (Kecskes, 2018). With this, it is shown the third hypothesis of this study is:

H3: Blockhain has a positive and significant effect on digital marketing.

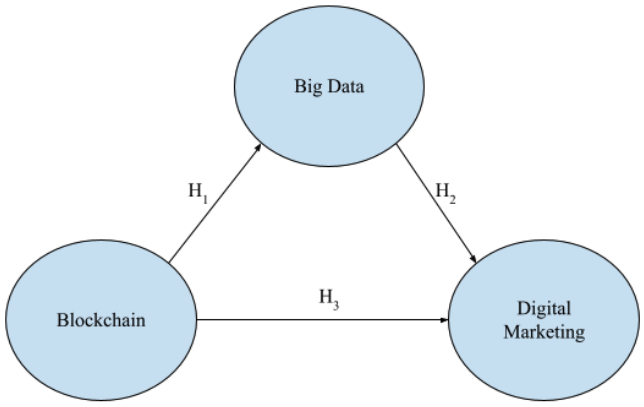

Figure 2 Research Model.

3. Research Method

This research uses a survey method with the target respondent are people who understand about the concept about blockchain technology and digital marketing. The sampling technique used was purposive sampling. The exact number of people who understands about blockchain concepts and digital marketing is not known for certain. Because of this, the process of calculating the number of samples will be calculated using the Cochran formula (Sugiyono, 2019). Based on the calculation of the Cochran formula, the number of samples obtained is 96.04 respondents which are rounded up to 97.

$$n = \frac{z^2 pq}{e^2} = \frac{(1{,}96)^2(0{,}5)(0{,}5),}{0.10^2} = 96{,}04$$

Note:
n= Number of samples
z= The price in the normal curve for a deviation of 5%, with a value of 1.96
p= 50% Correct chance
q= 50% Chance of being wrong
e= Sample error rate 10%

The questionnare items used in this research is from the variables blockchain, big data and digital marketing. The items in this research were measured using a Likert scale, where there were 5 points from point 1 which indicates strongly disagree, to point 5 which indicates strongly agree. The

items in the questionnaire for blockchain is adapted from Brauer and Erikkson (2020). The items inm the questionnaire for big data is adapted from Rejeb, Rejeb and Keogh (2020), while for the digital marketing variable were obtained from Suseno (2019). The data collected are being analyzed using the SmartPLS program, which uses partial least square model or PLS-SEM approach.

3.1 Measurement Model

The measurement model which includes validity and reliability of the research model carried out. Hair et al. (2019) stated that the Average Variance Extracted value must be above 0,5 and loading factor value must be above 0,7. Hair et al. (2014) say that if the AVE value is above 0,5, then the outer loading in the range of 0,4-0,7 can still be used in the research. The minimum composite reliability test is 0,7. Table 1 shows that the measurement of theinstruments is all valid, and all variables have AVE value above 0,5 and composite reliability more than 0,7

Table 1. Construct Evaluation

Construct and Item		Outer Loading
Blockchain (CR=0,883, AVE=0,601)		
BC3	Blockchain improves data privacy	0,729
BC4	Blockchain ensures that no data is tampered with	0,795
BC5	Blockchain ensures data integrity is maintained	0,824
BC6	Blockchain ensures data doesn't change	0,782
BC7	Blockchain ensures there is only one data reality	0,743
Big Data (CR=0,882, AVE=0,601)		
BD3	Big data can help track the flow of information	0,704
BD4	Big data can help marketers to track buying patterns	0,826
BD5	Big data enables businesses to stay competitive	0,825
BD7	Big data can track data about customer behavior	0,768
BD9	Big data can facilitate product innovation	0,746
Digital Marketing (CR=0,773, AVE=0,533)		
DM2	Digital media can provide interactive communication	0,767
DM3	Digital messages can be given to a large number of participants	0,669
DM5	Digital media has the ability to send and receive messages at the time consumers want	0,750

Table 2 shows the discriminant validity which measured using the Fornell-Larcker Criterion. The squared correlation for each latent must be higher than the correlation of one construct with another. In this research, the construct of each latent in higher than the correlation between one construct and another, therefore each variable in this research is accurate and valid.

Table 2. Fornell- Larcker Discriminant Validity

	Blockchain	Big Data	Digital Marketing
Blockchain	**0,775**		
Big Data	0,632	**0,775**	
Digital Marketing	0,703	0,561	**0,730**

Table 3. shows the R-square of big data is 0,399, which means that 39,9% of big data is influenced by blockchain. The R-square of digital marketing is 0,517, which means that 51,7% of digital marketing variable is influence by blockchain and big data.

Table 3. R-Square

Construct	R Square
Big Data	0,399
Digital Marketing	0,517

Table 4. Summary of Statistics Hypothesis Testing Results

Hypothesis	Standard Coefficient	p-value	Decision
H1: Blockchain has a positive and significant effect on big data	0,632	0,000	**Supported**
H2: Big data has a positive and significant effect on digital marketing	0,194	0,029	**Supported**
H3: Blockhain has a positive and significant effect on digital marketing	0,580	0,000	**Supported**

4. Results and Discussion

The test results of the first hypothesis show that Blockchain has a positive and significant effect on big data. Statistically, the p-value is 0,000<0,05 with the 5% significance level make the first hypothesis is supported. This result support the previous recearch conducted by Polyviuo,Velanas and Soldatos (2019), who said that blockchain infrastructure can positively affect big data. This research results also enriches the previous research that stated that blockchain positively affect big data (Brauer & Eriksson, 2020); (Karafiloski & Mishev, 2011).

The test results on the second hypothesis show that Big data has a positive and significant effect on digital marketing. The p-value is 0,029<0,05, with the 5% significance level makes the second hypothesis is supported. This result is conssitent with the prevoius research which stated that big data has a positive effect to digital marketing (Brahimi, 2020); (Grishikashvili, Dibb & Meadows, 2014); (Rejeb, Rejeb & Keogh, 2020)

The test results on the third hypothesis prove that Blockhain has a positive and significant effect on digital marketing. Statistically, the p-value is 0,000<0,05 with the 5% significance level make the third hypothesis is supported. This result enriches prevous research which states that blockchain has a positive effect to digital marketing (Brauer & Eriksson, 2020); (Ertemel, 2018); (Kecskes, 2018).

5. Conclusion

This study tests the research hypotheses that have been proposed in the first chapter and tested with the following conclusions: 1. Blockchain has a positive and significant effect on big data. 2. Big data has a positive and significant effect on digital marketing. 3. Blockhain has a positive and significant effect on digital marketing.The conclusion of the results of this study can also complement the results of previous studies that have been carried out previously, in which the research model was modified to see whether the indirect effect of blockchain on digital marketing through big data has a greater influence than the direct effect. Through the results of this study, it can be seen that the direct effect of blockchain on digital marketing is still greater than the indirect effect through big data.

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