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Industrial revolution 4.0 on big data adoption factors on social media users and popularity brands

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Abstract. The purpose of writing this paper is to look at how factors of big data adoption affect the users of social media and brand popularity. The method used in the writing of this paper is by using path analysis and also by doing literature study to find reference material. The results of the analysis indicate that there is influence of big data adoption factors that affect the popularity of the brand. With this research, we get big data model that influence the brand popularity

1. Introduction

Along with the development of technology in the world of internet use has an important role for someone. It is also felt in Indonesia internet users In Indonesia. According to [1] which was published in 2017, internet users in Indonesia recorded 132.7 million people. This number increased 51 percent compared to 2016. It is interesting to see that from 132 million internet users, 106 million of them are active internet users in social media which is the third largest in the world. This rating defeats countries such as Brazil and the United States. Big Internet users have not become an important thing for companies to use it to increase brand popularity. Though [2] consumers have the assumption that a company that has a famous brand will be safer than a company that has a brand less known. With the importance of a brand for the company of course the company must take advantage of any data held in support of the company's knowledge about customers. Companies are facing challenges that grow from a commercial perspective [3]. In particular, the value added of the company is generated from the large amount of data contained within the company's internal as well as external company. To get added value by utilizing data the company can use a method developed by Doung Laney commonly called big data. Big data is a term used to describe the amount of data volume both structured and unstructured data. It is interesting to see that the value of big data in Indonesia continues to increase but when associated with the amount of social media users the value of big data in Indonesia is still experiencing a distance that is less good than it should be.



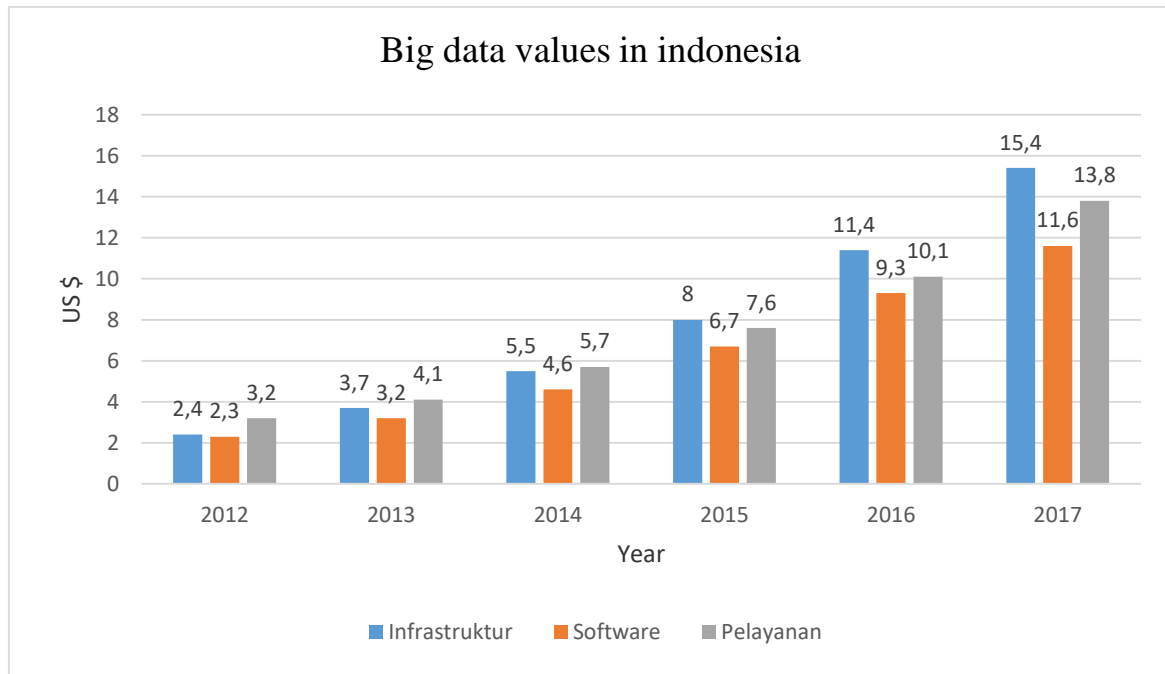


Figure 1. Big data value in Indonesia, Source: (Admin KataData, 2017).

Figure 1. shows that the value is around 18 million rupiah. In fact, by maximizing the management of big data, companies can manage existing data for their own benefit. With the company's desire to manage big data, it will certainly increase the value of big data in Indonesia.

2. Literature Review

Big data is a condition in which conventional database systems have the inability to enlarge capacity already created. At present, data on conventional database systems is very large and growth is too fast, so the architecture of conventional database systems is not able to deal with these conditions [4] Big data has three characteristics: volume, speed and variety. The organizational context is crucial to an organization's success. The organizational context refers to the descriptive size of the organization itself [5]. Elements that can be used are top management, human resources, training programs and information management level [6]. Environmental conditions are where the organization conducts its business activities, including from market conditions, competitor circumstances, information flows, and the prevailing regulations on which the organization is located. In the company's condition in doing business regulation becomes important thing to be considered [7]. In the current era of technology the use of wireless tools is an important problem in the application of information systems in adopting big data. Brand popularity is a very important element of equity for a company because brand awareness can directly affect brand equity [8]. If consumer awareness of brands is low, it is certain that the brand equity will also be low. Social media is a medium used by consumers to share text, images, sound, and video information with both other people and companies [9]. Knowledge is the process of translating information and experiences from the past that can be made a relationship and can be understood and applied by every individual [10].

2.1 The frame of mine

After analyzing some of the existing literatures, it was found that big data was influenced by organization, technology, environment and knowledge management. It can be seen also that analysis

will be done to see big data effect on social media user behavior and brand popularity and influence of social media user behavior toward brand popularity [11].

2.2. Conceptual Framework

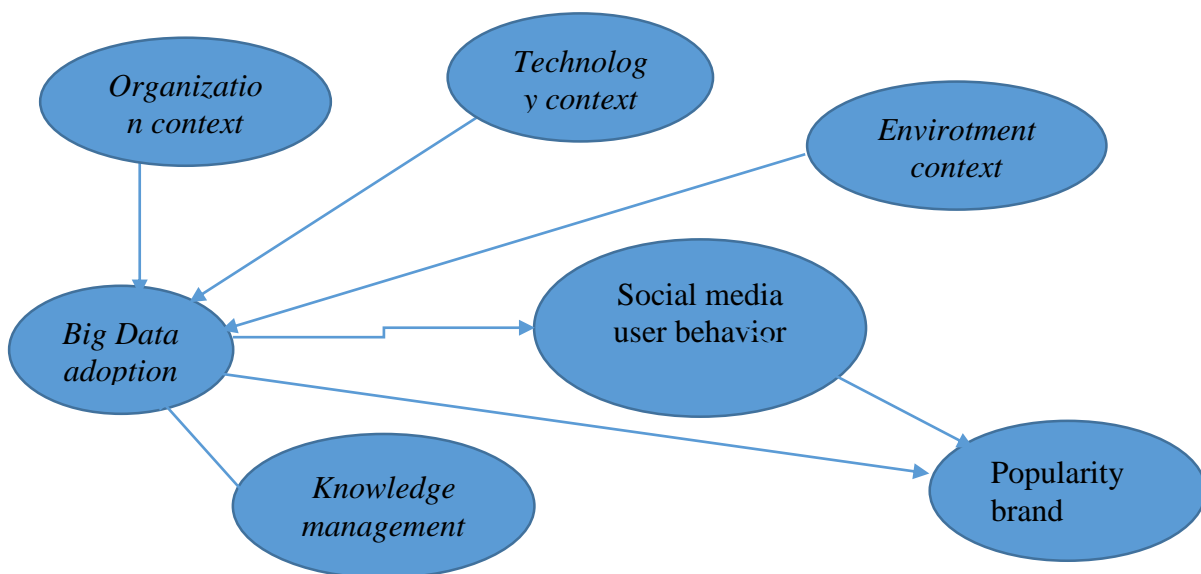


Figure 2. Big data Conceptual Framework concept factors.

3. Methodology

Existing problems will be analyzed so as to obtain a tentative conclusion or hypothesis. Literature materials also help in the preparation of questions used to answer hypotheses that have been made [12]. After getting the appropriate model then do the identification of variables and indicators. With the indicator then the measurement of variables will be more easily measured using the existing measuring scale [13]. After found the variables along with the indicator then carried out questionnaire dissemination in accordance with the sample that has been determined. Questionnaires that have been made using Likert scale [14]. Data from questionnaires that have been collected then performed statistical analysis. The results of the analysis will then be concluded to form suggestions for other research [15].

4. Result And Discussion

4.1 Validity test

To determine whether an indicator is a construct (latent variable), a convergence validity test of measurement model with reflexive indicator is assessed by correlation between item score and construct score calculated with the help of SmartPLS software. The individual reflexive size valid with the constants (latent variables) you want to measure ≥ 0.5 . From result of research got that result of validity test. Data < 0.5 will be omitted from the research indicator.

Table 1. Validity Test.

Indicator	Cross Loading	Decision
O1	0.609	Valid
O2	0.741	Valid
O3	0.615	Valid
O4	0.672	Valid
O5	0.546	Valid
T1	0.543	Valid
T2	0.737	Valid
T3	0.685	Valid
T4	0.660	Valid
T5	0.527	Valid
L1	0.586	Valid
L2	0.694	Valid
L3	0.330	Not Valid
L4	0.704	Valid
B1	0.691	Valid
B2	0.600	Valid
B3	0.602	Valid
B4	0.426	Not Valid
B5	0.567	Valid
B6	0.529	Valid
B7	0.594	Valid
X1	0.800	Valid
X2	0.779	Valid
X3	0.728	Valid
M1	0.732	Valid
M2	0.478	Not Valid
M3	0.760	Valid
M4	0.447	Not Valid
M5	0.666	Valid
P1	0.696	Valid
P2	0.666	Valid
P3	0.723	Valid
P4	0.754	Valid

4.2. Reliability test

More suggested to see the value is reliable construct then the value of composite reliability > 0.7 . By using SmartPLS 3.0, the reliability test results obtained from all variables have values above 0.7 so that the instruments used in this study are considered to be reliable for the questions in each variable used in this study. Table 2.

Table 2. Reliability test results.

Variable	Reliability	Decision
Big data adoption	0.77	Reliable
Knowledge management	0.81	Reliable

Variable	Reliability	Decision
Environment context	0.70	Reliable
Organization context	0.77	Reliable
Social media user behavior	0.76	Reliable
Popularity Brand	0.80	Reliable
Technology context	0.77	Reliable

4.3. R-square test

From the analysis result using SmartPLS software show R-Square value as follows:

Table 3. R-Square test result.

Variable	R-Square
Big data adoption	0.574
Social media user behavior	0.350
Popularity Brand	0.413

From Table 3. it is found that Environment, technology, organization and knowledge management affect 57% to big data while 43% influenced by other variable outside this research. From Table 3 it is found that big data affect 35% to social media user behavior while 65% influenced by other variable outside this research. From Table 3 it is found that big data and behavior of social media users affect 41% against brand popularity while 59% influenced by other variables outside this research.

4.4. Hypothesis test

To see the results of the hypothesis can be seen from the following Table 4.

Table 4. Path coefficient result.

Variable	T Statistics	T Count	Decision
Big data adoption ---> Social media user behavior	7.74	1.65	Accepted
Knowledge management → big data adoption	3.77	1.65	Accepted
Big data adoption → Popularity brand	3.88	1.65	Accepted
Environment context → big data adoption	2.29	1.65	Accepted
Organization context → big data adoption	1.65	1.65	Accepted
Social media user behavior → popularity brand	2.27	1.65	Accepted
Technology context → big data	3.33	1.65	Accepted

4.5. Research model

To know the big data factors affecting brand popularity, it is necessary to do regression test by using factors by using existing values of each factor and value of knowledge about big data adoption according to the respondents contained in the questionnaire. The results of calculations for regression analysis, obtained the following equation:

$$Y_1 = 6.82 + 0.23 X_1 + 0.14 X_2 + 0.30 X_3 + 0.1 X_4$$

$$Y_2 = 6.82 + 0.49 X_1 + 0.22 X_2$$

Based on the results of questionnaire processing obtained the result that the level of knowledge about the big data is 6.82 which is between the positions less and enough. By using factor scores and formula values, it can be seen the evaluation of factors that affect the big data adoption and its influence on brand popularity. Table 5.

Table 5. Maximum and minimum value.

Variable	Minimum	Maximum
X ₁ (Environment context)	-3.78	2.30
X ₂ (Organization context)	-3.38	2.32
X ₃ (Technology context)	-3.54	2.12
X ₄ (Knowledge Management)	-2.83	1.94

By looking at the formula that has been obtained and the minimum value and maximum in Table 6. can be seen that

$$Y_1 = 6.82 + 0.23 X_1 + 0.14 X_2 + 0.30 X_3 + 0.1 X_4$$

Since the equation of factors affecting big data adoption is all positive then to get the biggest Y value for each independent variable can be inserted the greatest value all to get result of equal to 8,9. Similarly, to see the smallest value of Y or to predict the possible decline can be inserted the smallest value for each independent variable so that the results obtained by 3.5.

Table 6. Maximum and minimum value.

Variable	Maximum	Minimum
X ₁ (Big data adoption)	-3.56	1.88
X ₂ (Social media user behavior)	-3.55	1.81

To see the value of the factors that influence the popularity of the brand can be seen that the equation used is

$$Y_2 = 6.82 + 0.49 X_1 + 0.22 X_2$$

Because the equation of factors affecting brand popularity is all positive then to get the largest Y value for each independent variable can be included the greatest value all so that the results obtained by 8.13. Similarly, to see the smallest Y or to predict the possible decline, it can be inserted the smallest value for each independent variable so that the result is 4.29

5. Conclusion

From result of questionnaire processing hence researcher can conclude that:

1. From the results of data processing has been done results obtained that the factors of the big data adoption affecting brand popularity is the environment context, organization context, technology context and knowledge management.
2. Big data adoption factor is a representation of brand popularity have indicator that is good information arrangement impact on big data implementation, Management of change influence to big data implementation, top management decision influence big data implementation, organizational structure influence big data implementation, staff training influence to adoption of application big data, wireless technology has big effect on big data, data control influences big data implementation, infrastructure influences big data, data interpretation capability affects big data,

government regulation affects big data implementation, information intensity influence big data implementation, Competitive Pressure affects the implementation of big data, Logo affects brand recognition, Price affects brand recognition, Packaging design affects customer's memory of brand, Purchasing decision is influenced by brand popularity, With big data implementation then the company can process the existing data quickly for economic and social analysis, Understanding the pattern of data will make the company able to solve problems, Data volumes change the pattern of social research, Truth data can affect innovation in business, The greater the data will make the data results become vulnerable, Properly stored data will be useful for generating opportunities, Updates or status changes to be important to social media users, Sharing of information becomes profitable in the use of social media, Information on social media affects purchases, Submission of information through Socialization more directly effective rather than delivery through documentation, Creation of system-based knowledge can be generated more and varied, and Systems-based knowledge management is effective in the delivery and acceptance of knowledge.

3. Big data adoption model of social media user behavior and brand popularity are:

$$Y_2 = 6.82 + 0.49 X_1 + 0.22 X_2$$

where bigger big data and social media user behavior is bigger and also the value of brand popularity also vice versa

4. Looking for other factors that affect big data in Indonesia so that it can increase percentage of influence big data.
5. Expanding existing population and sample sampling so that data will become more varied.
6. Perform data collection methods that are not only rigid on the questionnaire alone, do the data collection of the facts and phenomena that occur in the community. Then can be modified in order to be tested by statistical methods

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