The Effect of Intellectual Capital on Innovation Capability

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Abstract—**This study aims to determine and analyze the effect of intellectual capital on innovation capability. This study uses a quantitative approach. The independent variables studied included intellectual capital created from human capital, and structural capital. The dependent variable is the company's innovative capabilities. In this study using a questionnaire with 16 questions. This study had 32 respondents from different startup companies in Indonesia. Analysis of the data used in the form of validity and reliability statistics, classical assumption tests, and multiple linear regression analysis. The results of the study show structural capital and human capital partially have a significant effect on innovation capability. Structural capital and human capital also have a significant effect on innovation capability.**

Keywords—*intelectual, capital, human capital, innovation capability*

I. INTRODUCTION

The developments of technological rapidly such as today demand all aspects to be able to combine with technology, one of which is economic or business. Now businesses are more efficient because they are assisted by technology and information such as digital technology services that are connected to the internet. Therefore it facilitate all human activities, for example, people who just sit and hold a cellphone or in front of a computer all needs will be available therefore it is not as troublesome as before who did not know technology and information. All fields such as transportation, culinary, education, and entertainment are very easy to get only with our cellphones connected to the internet. The world is getting more and more almost everything we need will be obtained quickly with only we squeezing on the screen of a cellphone or computer. Currently the biggest development in the world is a startup business. Startup is a company that has just been established in a building or a pilot period, more categorized only in technology and information companies that are developing in the internet world [1]. But now startups are not only limited to newly established businesses but also

businesses apply technology and information even though the company that has just been established.

Based on the results of a recent survey conducted by BPS in 2010 the population of Indonesia amounted to 237 million people with a dominance of ages in the range of 15-44 years. At that age the use of the internet cannot be separated from the internet. According to a survey also conducted by the Indonesian Internet Service Organizing Association (APJII) in 2017, that more than 50 percent or around 143 million Indonesian people have been connected to the internet. The devices used to access the internet were 44.16% using smartphones, 4.49% using computers / lapotopes, and the other 12.07%, the use of the internet was not only for communication but also possible to order goods, train tickets, business, and others. The growth of internet users every year continues to grow, seen in Figure 1 that at the last survey conducted, the growth of users in 2017 reached 143,26 million users. If we compare from 1998 to 2017 internet users are very much different. This is due to many factors that influence the trend, life style, and needs. Therefore now almost all human activities depend on the name of the internet [2].
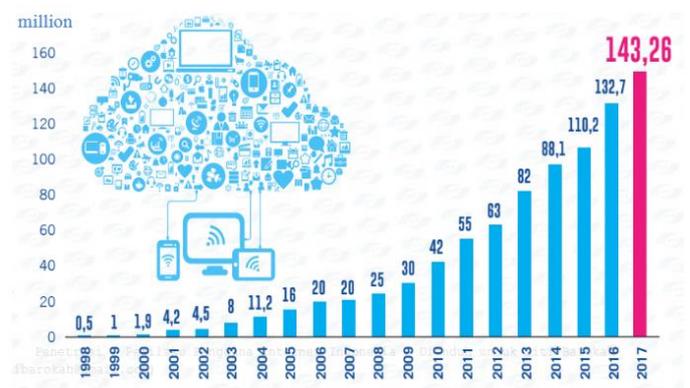

Fig. 1. Growth of internet users. Source : Asosiasi Penyelenggara Jasa Internet Indonesia (2017) [2].

The high number of internet users is a business opportunity, one of which is to facilitate all activities therefore startups appear. The growth in the number of startups in Indonesia is very rapid compared to neighboring countries in the Southeast Asia Region. According to Startup Rangkin sources in November 2018 if Indonesia occupies the fifth position with the highest number with 1,944 startups (Table 1) [3].

This has proven to be a growing number of communities that have established a startup that is both small and large, which is spread throughout Indonesia. With this startup, making knowledge in Indonesia even better, especially intellectual capital. In the technological era, it is very needed knowledge. According to Bartholomew [4], that a company competes in a free market, the company must have knowledge in order to survive. Knowledge can be an important key factor that creates more value, therefore intellectual capital is needed. In addition, in the 21st century, all kinds of company needs are very good at creating the value of intellectual capital. Intellectual capital is often known by experts or researchers as an important source of the company's competitive advantage. This can be seen in companies where intellectual capital is an intangible investment usually found in research, R&D development, innovation, knowledge and development, infrastructure which is the most important source of corporate performance [5]. Like Startup, which is well-known in Indonesia such as Tokopedia, which facilitates convenience in shopping, Traveloka provides easy transportation to get around Indonesia, GO-Jek, etc.

TABLE I.   RANKING OF WORLD STARTUPS

No	Country	Startup
1	United States	46.206
2	India	5.932
3	United Kingdom	4.857
4	Canada	2.433
5	Indonesia	1.982

Source : Startup Rangking (December 2018) [3].

II. THEORY AND HYPOTHESIS

In the digital era like today, a business is not only focused on producing products but also able to produce products that have knowledgetherefore the company is able to have more value than its competitors. In creating value from a product or service a business can no longer rely solely on financial capital. Because the current situation is far different from the era before knowing digital. Where creating value today means businesses are able to provide added value to their products both in their products and services. Knowledge will be intellectual capital if a business is able to create value that causes a positive response in the market. According to Lytras and Pablos [6], that companies must combine financial capital with intellectual capital to be able to create added value for business. Intellectual capital consists are human capital and structural capital [6,7].

Structural capital [4,8], that this approach focuses on the relationship between people and social relations. In structural capital, this has the advantage that people will be connected to each other who have not previously known. In addition, according to Castro et al. [9], that structural capital is everything behind the office. Structural capital describes if structural capital is the framework and glue of the organization because it provides tools and is able to transfer knowledge during business activities. According to Castro et al. [9] that the component of structural capital are technology capital and organizational capital. Technology capital is a capital of innovation to combine organizational knowledge to develop activities and functions of technical systems of operations, develop production processes effectively, and advance organizational knowledge to develop technological innovations in the future, which consists are business elements in research and development, infrastructure, intellectual and industrial property. While organizational capital is the result of a combination of intangible assets, in which business processes develop in it consists of elements of organizational culture, information and telecommunications, and organizational structure.

There are many differences with the definition of human capital, according to Abeysekera [10] that human capital focuses more on combining individual factors and the strength of the group of company workers with knowledge, ability, behavior, energy, and employee commitment to the desire to share information, participation in a team and focus on company goals. Human capital is made up of employees who make company management while structural capital is controlled and regulated by the company [9].

Factors that enable innovation: e-Commerce, sustainability, development, and focus on accelerating the creation of new products. An important role of innovation is to transfer knowledge into new products, processes, and services [11]. The innovation capability will lead to effective innovation potential for a business. Where the concept of innovation is not as simple as thought, many aspects of management, leadership, and technical aspects are good at allocating strategic resources, market knowledge, and organizational incentives. The success of a company is a company that embraces innovation capabilities in the core technology that enables companies to respond quickly to changing market conditions and to complex product specifications [12]. Based on these reasons, the researcher determines 3 hypotheses, as follows figure 2:
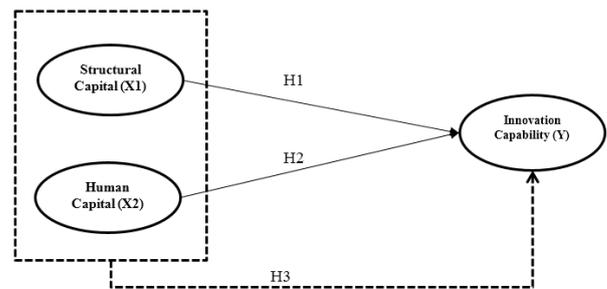

Fig. 2.   Model hypothesis.

There are 3 hypotheses in this study, namely:

- H1: Stuctural Capital has a significant effect on Innovation Capability.

- H2: Human Capital has a significant effect on Innovation Capability.

- H3: Structural Capital and human capital together have a significant effect on Innovation Capability.

III. RESEARCH METHODS

A. Samples and Data

This research focuses on new and old startup companies in Indonesia. The Startup company was chosen because currently startups are growing, especially in Indonesia, more are setting up startups from both students and the private sector. In this study using a questionnaire with 16 questions. This study has 32 respondents from different startup companies in Indonesia. Respondents are those who are startup owners or who work at startups in Indonesia. In this study there are sample criteria, as follows table 2:

TABLE II. CRITERIA OF SAMPLE

Characteristics	Category	Amount	Total	Percentage	Total
Time	>5 year	4	32	12,5	100%
	5 year	3		9,375	
	4 year	3		9,375	
	3 year	3		9,375	
	2 year	7		21,875	
	<1 year	12		37,5	
Investment	>1 billion	7	32	21,875	100%
	700 million -1 billion	2		6,25	
	300 million – 700 million	6		18,75	
	100 million – 300 million	2		6,25	
	<100 million	15		46,875	
Number of employees	>20	8	32	25	100%
	15-20	2		6,25	
	10-15	1		3,125	
	5-10	9		28,125	
	<5	12		37,5	

B. Variables

This study uses two independent variables, namely capital structure and human capital, which includes intellectual capital. The independent variable used in this study is innovation capability.

C. Research Methods

This study uses a quantitative approach with multiple linear regression analysis methods for all hypotheses. According to Sugiyono [13], that quantitative approach is a method that is objective, measurable, rational, and systematic and research data in the form of numbers and analysis using statistics. Based on the hypothesis above, this study uses a multiple linear regression analysis method. According to the method of multiple regression analysis in this study consists of two independent variables, namely the structure of capital and human capital besides that also want to know the effect jointly between the independent variables on the dependent. The multiple linear regression equation with two independent variables is as follows:

$$Y = a+b1X1+b2X2+e$$

Information:
Y: Dependent Variable
X: Independent Variables
a: Constant
b: Regression Coefficient
e: Error

IV. RESULTS

TABLE III. DESCRIPTIVE STATISTICS TEST

Items	SS		S		CS		CTS		TS		STS		Mean	
X1.1	17	53,1	10	31,3	3	9,4	2	6,3	0	0,0	0	0	170	5,3
X1.2	11	34,4	6	18,8	7	21,9	7	21,9	1	3,1	0	0	147	4,6
X1.3	17	53,1	7	21,9	5	15,6	2	6,3	1	3,1	0	0	165	5,2
X2.1	15	46,9	9	28,1	5	15,6	3	9,4	0	0,0	0	0	164	5,1
X2.2	17	53,1	8	25,0	5	15,6	1	3,1	1	3,1	0	0	167	5,2
X2.3	14	43,8	10	31,3	5	15,6	3	9,4	0	0,0	0	0	163	5,1
X2.4	9	28,1	11	34,4	7	21,9	2	6,3	3	9,4	0	0	149	4,7

Table 3. Cont.

Y1.1	18	56,3	12	37,5	2	6,3	0	0,0	0	0,0	0	0	176	5,5
Y1.2	18	56,3	11	34,4	3	9,4	0	0,0	0	0,0	0	0	175	5,5
Y1.3	19	59,4	11	34,4	2	6,3	0	0,0	0	0,0	0	0	177	5,5
Y1.4	13	40,6	16	50,0	2	6,3	1	3,1	0	0,0	0	0	169	5,3
Y1.5	17	53,1	12	37,5	2	6,3	1	3,1	0	0,0	0	0	173	5,4
Y1.6	17	53,1	12	37,5	2	6,3	1	3,1	0	0,0	0	0	173	5,4
Y1.7	8	25,0	11	34,4	8	25,0	2	6,3	2	6,3	1	3,1	146	4,6
Y1.8	15	46,9	14	43,8	3	9,4	0	0,0	0	0,0	0	0	172	5,4
Y1.9	16	50,0	12	37,5	4	12,5	0	0,0	0	0,0	0	0	172	5,4
Grand Mean														**5,2**

Source: SPSS Output

Based on sixteen statements representing three indicators, the average score reaches 5.2. According to Bhattacherjee [14] descriptive research is directed at making careful and detailed observations of documentation of an interesting phenomenon. The review of this observation must be based on the scientific method. This analysis is done by calculating the mean value for each construct or latent variable which is interpreted into 3 categories according to Levine et al. [15]. From table 3 the output of descriptive statistics is 5.2 therefore it is categorized as high, between 4.34-6.00.

TABLE IV.   VALIDITY TEST

| Item	Correlation Coeficient	Sig.	Criteria
1	0,697	0,000	Valid
2	0,785	0,000	Valid
3	0,856	0,000	Valid
4	0,713	0,000	Valid
5	0,790	0,000	Valid
6	0,840	0,000	Valid
7	0,701	0,000	Valid

Source: SPSS Output

Based on the results of the validity test in table 4, if the value of items from items 1 to 7 has a significant value <0.05, that is equal to 0.00. To be able to determine whether all items are valid or cannot be seen at significance values. It can be seen if all items are valid because the value is significant <0.05. Besides that, you can also compare r count with r table. It is known that r table is 0.349. Based on all the results of the calculated r value, the value is> 0.349, it can be seen if the validity test is fulfilled.

TABLE V.   RELIABILITY TESTS

Cronbach's Alpha	N of Items
,882	7

Source: SPSS Output

Based on the reliability test results in table 5, it is known if the Cronbach Alpha value is> 0.05, which is equal to 0.953. According to Sekaran [16], the Cronbach Alfa value of less than 0.6 is not good or not reliable while 0.6 and above is good and stated reliably. According to the results of SPSS, the value of Cronbach Alfa is 0.953 therefore this study passed the reliability test. This means that the gauge will get a consistent measurement if the test measurements are repeated again.
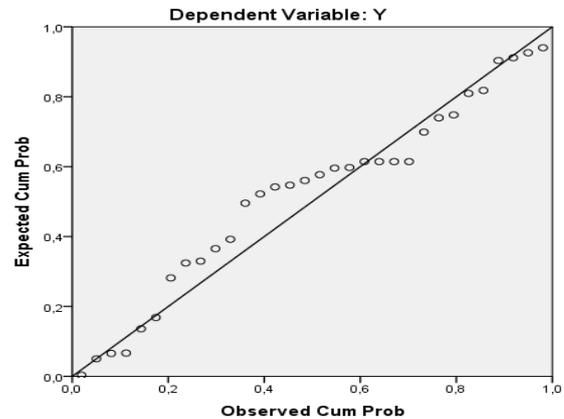
Source: SPSS Output

Fig. 3.   Normality test.

Figure 3 is the result of SPSS from the normality test using the graph method. To analyze it, the distribution of data on the diagonal lines on the P-P chart Plot of regression standardized residuals was seen. Seen in figure 3, it is known if the points spread around the diagonal line therefore the normality test is fulfilled.

TABLE VI.   MULTICOLLINEARITY TEST

Model		Collinearity Statistics	
		Tolerance	*VIF*
1	(Constant)		
	X1	,389	2,573
	X2	,389	2,573

Source: SPSS Output

Table 6 is the result of SPSS from the multicollinearity test by looking at the tolerance and inflation factor (VIF) values. Based on the results of SPSS that the Tolerace value> 0.1, that is for the value of the first independent variable (X1) is 0.389 and the value of the second independent variable (X2) is 0.389. VIF value <10 with X1 and X2 values of 2.573 therefore this study can be passed the multicollinearity test.

Scatterplot
Dependent Variable: Y
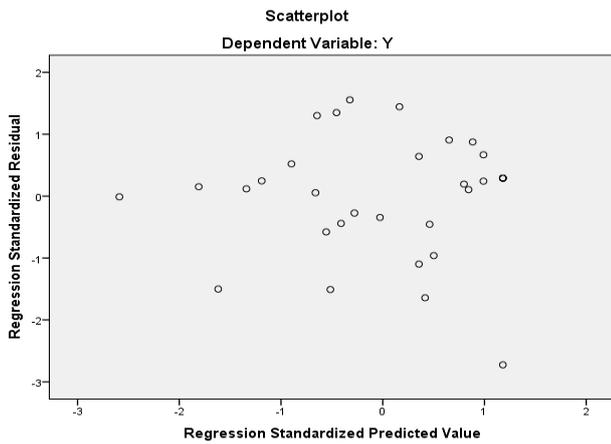
Fig. 4. Heterocedasticity test.

The results of SPSS in figure 4 that these points spread on above and below the number 0 on the Y axis thus it can be seen if the study is not heterocedasticity. Therefore in general it can be concluded if the classical assumption test in this study is fulfilled which means that the regression model that will be carried out will not be biased and this test can be trusted. If the classical assumption test is fulfilled then multiple linear regression tests can be carried out.

TABLE VII.   MULTIPLE LINEAR REGRESSION TEST

Model		Unstandardized Coefficients	
		B	Std. Error
1	(Constant)	2,230	,286
	X1	,226	,081
	X2	,390	,088

Based on the results of multiple linear regression tests in table 7 with two independent variables the equation can be determined as follows:

$$Y = 2,230 + 0,226X1 + 0,390X2$$

The meanings of the numbers above are as follows:

- The constant value (a) of 2.230, can be interpreted if structural capital and human capital value is 0, then the innovation capability is 2.230.

- The structural capital (b1) regression coefficient value is positive, which is 0.226; can be interpreted that an increase in structural capital by 1 unit, it will increase innovation capability by 0.226 units assuming other independent variable values remain.

- The value of the regression coefficient of human capital (b2) is positive, which is 0.390; it can be interpreted that the increase in human capital by 1 unit, it will increase innovation capability by 0.390 units assuming the value of other independent variables is fixed.

TABLE VIII.   T / PARTIAL TESTS

Model	t	Sig
(Constant)	7,807	,000
X1	2,786	,009
X2	4,439	,000

Based on the results of the t / partial test according to table 8, it can be seen that the significance value for structural capital is 0.009 <0.05 and t count (2.786)> t table (2.042). Variable human capital, it is 0,000 <0,05 and t count (4,439)> t table (2,042). It can be concluded that structural capital and human capital variables partially have a significant effect on innovation capability therefore H1 and H2 are accepted.

TABLE IX.   F / SIMULTANEOUS TEST

Model		F	Sig.	R Square
1	Regression	60,226	,000[b]	,806
	Residual			
	Total			

Based on the F test in table 9, it is known if F count is 60.226> F table is 3.328 which means that structural capital and human capital variables together or simultaneous have a significant effect on innovation capabilitythus it can be known if H3 is accepted. The R2 or determination with a value of 0.806, which means the ability of all independent variables affect innovation capability by 80.6%, the remaining 19,4 that innovation capabilittywas influenced by other variables not examined in this study.

A. Conclusions and Discussions

Based on the results of the t / partial test, it can be seen that structural capital and human capital variables have a significant effect on innovation capabilitty therefore H1 and H2 were accepted. It happens because structural capital works good startup businesses in Indonesia, for example, the capability of startup businesses to become good adhesives of organizations because they are able to provide and transfer knowledge therefore they are able to create innovations for companies during business activities. Hypothesis 2 is accepted because human capital in the startup business in Indonesia runs well, namely the ability of both employees to focus on combining individual factors and the strength of the group of company workers with knowledge, ability, behavior, energy, and employee commitment to the desire to share information, participation in a team and focus on company goals.

Structural capital and human capital variables together or simultaneous have a significant effect on innovation capability therefore it can be known if H3 is accepted. The R2 or determination with a value of 0.806, which means capability of all independent variables affect innovation capability by 80.6%, the remaining 19,4 that innovation capability was influenced by other variables not examined in this study. This was in accordance with the theory of Gabriel [12], that the success of a company is a company that embraces innovation

capabilities in the core of technology that enables companies to respond quickly to changing market conditions and to complex product specifications.

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