

# ICT Education

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**Submission date:** 19-Aug-2020 04:30PM (UTC+0700)

**Submission ID:** 1371341779

**File name:** IGI.edited\_uji\_plag.docx (131.78K)

**Word count:** 7540

**Character count:** 44395



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# New Trend in Intellectual Capital Disclosures of Higher Degree Institutions in Indonesia

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## ABSTRACT

*This study aims to investigate the determinant factors that may influence web-based intellectual capital disclosure of Indonesian universities, such as autonomy, competitiveness, age, and size. The web-based intellectual capital disclosure is expected to overcome the limitation of traditional intellectual capital disclosures. This study also examines Multiple regression analysis is conducted in 83 Indonesian higher education institutions. The results show that extensive use of intellectual capital disclosure through Indonesian universities' websites, especially in internal capital. In contrast, the disclosure of external capital and human capital is still limited. Furthermore, autonomy gives the most noticeable impact on web-based intellectual capital disclosure. It is because autonomy provides freedom for universities in managing their institution, especially in improving their web-based intellectual capital disclosure to attract more public and government funds.*

**Keywords:** Autonomy, Competitiveness, Age, Size, Traditional intellectual capital disclosures, Web-Based Intellectual Capital Disclosure, Higher Education, Indonesia.

## INTRODUCTION

In maintaining their existence, organizations must consider several things, such as tangible factors and even the intangible factors owned by the organization. A critical intangible-asset factor is intellectual capital (IC) (Siboni et al., 2013). Nowadays, the intensity of competition is getting higher causes the role of IC to become more crucial in an organization. In this current condition, an organization that can survive is the one that can be adaptive and innovative (Low et al., 2015).

The study of intellectual capital has become more crucial for an organization, especially a not-for-profit organization such as a university. University is an organization with a high degree of intangibility since its primary outputs are intangible services, hence making a definite requirement of intellectual capital disclosure (Secundo et al., 2016). There is an argument that stated that the university's primary purposes are producing and disseminating knowledge as its main asset. An intellectual capital disclosure is vital to be done by higher education (Ramírez et al., 2016).

Although the intellectual capital disclosure for university is crucial, studying these critical matters is still limited (Dumay and Guthrie, 2017). Traditionally, several researchers use the annual report of the university as the primary source to obtain intellectual capital information. They claim that the annual

report is not created for intellectual capital disclosure. Therefore, the information is not reliable and limited (Dumay and Cai, 2015). Thus, a new method in disclosing intellectual capital needs to be done to give accurate information about intellectual capital (Edvinsson, 2013).

Rossi et al. (2018) argued that several researchers were exploring a new way of intellectual capital disclosure through the website. The existence of a website provides greater transparency, reliability, and accessibility in disclosing any information with minimum cost (Gallego-Alvarez et al., 2011). Universities could focus on using the website for disseminating information and publication or research for external users for annual, quarterly, theoretical periods and in real-time. The university official website may become a tool to improve intellectual capital disclosure (Gallego-Alvarez et al., 2011).

This paper's primary focus is to investigate the existence of intellectual capital disclosure through Indonesian universities' websites and examine the influence of determinant factors towards web-based IC disclosure from the previous research. This paper indicates four determinant factors: autonomy, competitiveness, age, and size.

Therefore, this paper is the first study to reveal the new data source about intellectual capital information being disclosed through websites done by Indonesian universities and providing evidence of determinant factors affecting the intellectual capital disclosure of Indonesian higher education institutions. Furthermore, the amount of research on web-based intellectual capital disclosure of universities in Indonesia is still few. It also deeply examines the relationship between intellectual capital and determinant factors that influence the disclosure of intellectual capital information.

This study is conducted on Indonesian universities that have A-accreditation from the period 2018. A-accreditation is the best accreditation issued by the Indonesian National Education Accreditation Body for Indonesian campuses that have exceeded national accreditation standards, thus proving the performance of institutions that are already excellent (Indonesian National Accreditation Body, 2017). Based on Webometrics, not all Indonesian universities own official websites except higher education institutions with A-accreditation; thus, these universities are expected to be able to disclose information about intellectual capital comprehensively on their sites. The result of this research may overcome the limitation of traditional intellectual capital information disclosure methods done by Indonesian universities and give a new strategy to help Indonesian universities in promoting their performance towards the stakeholders through web-based intellectual capital disclosure.

## BACKGROUND

Intellectual capital is considered one of the most vital intangible assets for enhancing organization values (Moranu, 2013; Marr et al., 2015; Cricelli et al., 2018). It was also being emphasized by Marr et al. (2015) that intangible resources and intellectual capital are the keys for firms to develop a competitive advantage; it also empowers the organization to run its operation. Correspondingly, Edvinsson (2013) portrayed intellectual capital as intellectual materials that can be changed over into values. Intellectual Capital is the total value of an organization that describes the intangible assets of a company that comes from three pillars, namely human capital, organizational (internal capital), and relational (external capital) (Cricelli et al., 2018).

The past observational examinations on ICD tend to be more focused on the companies (Low et al., 2015), with less focus on a public or non-profit organization. University is one of the examples from the non-profit organization that utilize great extent intangibles resources such as knowledge (Bezhan, 2010; Low et al., 2015; Secundus et al., 2015). In higher education institution, IC refers to all intangible assets owned by the institution, including processes, the capacity of innovation, patents, the knowledge possessed by its members, talent, skills, recognition from the public, cooperative networks and others (Ramirez et al., 2011, Cricelli et al., 2018). IC reporting is an approach that is used to measure intangible assets to describe the results of knowledge-based activities because the stakeholders of universities emphasize the need for IC information to make the right decisions so that the transparency of universities in intellectual resources is needed (Rossi et al., 2018).

However, previously, numerous IC scientists have communicated a problem arise from exploring ICD solely through annual reports, asking for more research inspecting other potential IC dispersal channels (Abeysekera, 2006; Dumay and Cai, 2015; Dumay and Guthrie, 2017). It is because all of these files are arranged yearly and do not exclusively concentrate on IC. Hence, a few investigations tending to university revelations have featured that the site can be an increasingly valuable device to improve correspondence with the university's stakeholders (Ismail and Bakar 2011; Bisogno et al., 2014). Based on past research and following a proposal by several studies (Edvinsson, 2013; Guthrie, 2014; Dumay and Guthrie, 2017), this study expects to examine online ICD through an official website owned by universities and to look for relevant factors behind this disclosure. The examination does not concentrate on the management viewpoint; rather, it supports the data's need for external stakeholders who request more prominent responsibility about the colleges' significant resources, for the most part, including IC. In doing as such, this investigation investigates another approach to unveiling IC and potential determinants influencing this disclosure.

The existence of a website provides greater transparency, reliability, and accessibility in disclosing any information with minimum cost. Universities could focus on using the website for disseminating information and publication or research for external users for annual, quarterly, theoretical periods and in real-time. The university official website may become a tool to improve intellectual capital disclosure (Gallego-Alvarez et al., 2011). In higher education institutions, IC refers to all intangible assets owned by the institution, including processes, the capacity of innovation, patents, the knowledge possessed by its members, talent, skills, recognition from the public, cooperative networks, and others (Corcolez et al., 2011). IC reporting is an approach used to measure intangible assets to describe the results of knowledge-based activities because the stakeholders of universities emphasize the need for IC information to make the right decisions so that the transparency of universities in intellectual resources is needed (Bornemann and Leitner, 2002). The increase in demand for information and transparency of higher education institutions by stakeholders is due to the competition faced by higher education institutions getting tighter, so universities are required to communicate the results that have been achieved (Ramirez and Gondillo, 2014). The summary of some previous studies in investigating the IC in universities is provided in Table 1.

*Table 1. Previous studies*

Researcher and Year	Observation	Results
Bossi et al. (2018)	Italian public universities	There is evidence about web-based ICD by universities. This research also stated that there is a relationship between age and web-based ICD.
Sánchez et al. (2009)	European Universities (especially in Madrid and Austria)	There is a positive relationship between Autonomy and ICD
Gallego-Alvarez et al. (2011)	Spanish Universities	A positive relationship between Internationality and web-based Intellectual capital disclosure
Cricelli et al. (2018)	Colombian Public Universities	A positive relationship between Intellectual capital and university performance
Chen and Chen (2013)	Taiwan Universities	A positive relationship between university rank, age, and autonomy toward Intellectual capital
Fazlagic and Skisiewicz (2014)	Poland Non-public universities	A positive relationship between IC and competitive advantage
Rahayuningtyas and Triana (2017)	Indonesian universities	A positive relationship between Autonomy with Intellectual capital disclosure

## **Autonomy and Web-based Intellectual Capital Disclosure**

The existence of autonomy possessed by higher education institutions provides a broad range of freedom for universities to run their institutions in order to develop the intellectual capital which can be used to attract and manage government funds and public funds (Sánchez, 2009; Ramírez et al., 2011). The purpose of such disclosure is to give a positive signal toward the stakeholders that universities have been managed well. Therefore, giving information regarding the universities' performance toward stakeholders is in line with signaling theory (Connolly et al., 2011).

The disclosure of intellectual capital becomes a signal that can increase the knowledge of stakeholders with the central resources possessed by universities (Rossi et al., 2018). In attracting public and government funds, universities should provide highly reliable information. However, based on previous research, conducting traditional ICD through annual reports will cause the emergence of unreliable information because the annual report is not designed to concentrate exclusively on IC reporting. (Abeysekera, 2006; Dumay and Cai, 2015; Dumay, 2016). An unreliable source may create misleading information for the stakeholders. Therefore, by using web-based disclosure, university can provide greater transparency, reliability, and accessibility in disclosing intellectual capital information with minimum cost (Gallego-Alvarez et al. 2011). Increased funds obtained by universities and the presence of autonomy have increased universities' flexibility in managing and improving the institutions (Errano-Cinca et al., 2009). Based on the background, the hypothesis one is higher education autonomy has a positive effect on web-based disclosure of intellectual capital information on the official university website.

### **Competitiveness and Web-based Intellectual Capital Disclosure**

Intellectual capital can improve organizational performance and competitiveness because intellectual capital existence drives higher education institutions to focus on managing their resources to survive in a rapidly changing (Secundo et al., 2016). Knowledge, innovation, and Intellectual capital are very carefully related to universities, and it is used as a tool to build sustainable competitive advantages.

The claim supports research that higher education institutions' rankings that determine the universities' competitiveness are related to perceptions of intellectual capital (Chen and Chen, 2013). Based on some previous studies, higher education institutions will continue developing their intellectual capital publications to maintain and raise the rank obtained by higher education institutions beforehand (Siboni et al., 2013). Therefore, universities have applied signaling theory (Bergh et al., 2014). Signaling theory has a strong correlation with the disclosure of intellectual capital, which should be done by universities (Connolly et al., 2011 and Ramírez et al., 2016).

Furthermore, a university in Indonesia does not only facing domestic competition but also internationally. In the new learning economy, higher education will try to fulfill international standards to enlist the fittest understudies and analysts by offering them the opportunity to find out about different societies and advanced access education in other nations, thus increasing competitiveness (Kim, 2009). This kind of competition drives universities to give more information about their performance, tending to worldwide understudies and scientists (Ramírez et al., 2016). Therefore, the usability and accessibility of web-based ICD will help universities disseminate intellectual capital information globally (Gallego-Alvarez et al., 2011). Based on the explanation above, the second hypothesis is that the universities' competitiveness contributes a positive effect on web-based disclosure of intellectual capital information.

### **Age and Web-based Intellectual Capital Disclosure**

According to Ismail and Bakar (2011), in their investigation of an example of Malaysian state higher education institutions, older universities unveil more information about their institution's performance in their yearly reports and on their sites than in new colleges. By disclosing this information, universities have implemented signaling theory (Bergh et al., 2014). The underlying reason is that older organizations have more experience in publishing information, and organizations with more experience will know more about the need from stakeholders for organization information (Connolly et al., 2011).

On the contrary, a few researchers underline how newly established higher education institutions are increasingly innovative and bound to receive new advancements to enhance their operations compared to

older universities, which may tend to reject changes (Saxton and Guo, 2011). Despite the positive relationship stated by Ismail and Bakar (2011) and the other researcher, in the contrary Gallego-Alvarez et al. (2011) and Bisogno et al. (2014) stated that they had not found any correlation between university age and web-based intellectual capital disclosure. Based on the explanation above, the third hypothesis is that there is a correlation between university age and the web-based disclosure of intellectual capital information.

### Size and Web-based Intellectual Capital Disclosure

Generally, big public organizations will reveal more data through innovative and imaginative devices (sites) than smaller organizations. It is because they have more assets and are exposed to have a more prominent interest in accountability, having a significant number of stakeholders to maintain their institution's reputation (Serrano-Cinca et al., 2009; Rossi et al., 2018). Another supporting supposition originates from Gallego-Alvarez et al. (2011) that expressed organization size has been one of the most utilized factors to clarify the disclosure of data.

Along these lines, for the signaling theory perspective, a site can be a stable and a proficient vehicle of correspondence to satisfy responsibility in terms of information dissemination to higher education institutions' stakeholders (Bisogno et al., 2014). Besides, bigger public entities and colleges specifically are more politically noticeable. They are liable to more prominent outer impact from their stakeholder network (for example, citizens, governments, understudies). Therefore they are driven to uncover more data, particularly on the web, to diminish political expenses and get more noteworthy authenticity (Gallego-Alvarez et al., 2011; Garcia-Sánchez et al., 2013; Rossi et al., 2018).

Furthermore, taking into record these contentions most past research has discovered that schools' and colleges' size impacts the measure of voluntary information uncovered on sites and site page navigability (Serrano-Cinca et al., 2009; Gallego-Alvarez et al., 2011; Garcia-Sánchez et al., 2013; Rossi et al., 2018). Based on previous studies, University's size was only being measured from the number of students owned by the higher education institution (Rossi et al., 2018). However, this study also uses the number of lecturers to enrich the explanation regarding university size and its relationship with web-based intellectual capital disclosure. By adding several lecturers which reflects the worker of universities, this paper also adds one more factor that is needed to measure the size of an organization (García-Sánchez et al., 2013). Therefore, the author split the hypothesis regarding the correlation between size and web-based intellectual capital disclosure to give evidence of the relationship between numbers of lecturer toward web-based intellectual capital disclosure. Based on the explanation above, the fourth hypotheses are:  
 H4a: There is a positive correlation between the numbers of the student with the web-based intellectual capital disclosure.  
 H4b: There is a positive correlation between numbers of lecturer with the web-based intellectual capital disclosure.

### RESEARCH METHODOLOGY

In examining the model, this study employs multiple regress analysis to analyze the correlation between the variables. The data collection is categorized as secondary data, and the sample is Indonesian universities in the year of 2018. Moreover, the universities chosen as the sample must possess an accreditation and official website. The data were found from the universities' official website, QS World University Ranking, and Indonesian Directorate General of Higher Education website. Accordingly, Table 2 contains the description regarding the total sample observed, in which 83 universities are for one year, thus in total, there are 400 observations.

Table 2. Summary of the sample observed

Sampling Criteria	No. of Observations
All Indonesian universities that have official websites during 2018 period	2149

Less with Indonesian universities with accreditation besides A	(2064)
Less with Indonesian universities that not stated the data about the number of lecturer and students	(2)
Universities used as the sample	83
Research period (2018)	1
Total sample	83

Web-based intellectual capital disclosure has 25 items of ICD from the Tripartite Classification of Intellectual Capital Disclosure Items (Low et al., 2015). In addition, this study combines the ICD with 17 items of web accessibility items adopted from Binogno et al. (2014). The Scoring system is deployed one if it is disclosed in universities' websites and 0 if it is not disclosed. Furthermore, from table 3, it can be concluded that the overall score from ICD and web accessibility items will be combined and calculated by using the GICD index (Rossi et al., 2018).

$$GICD \text{ Index} = \frac{\sum_{k=1}^n d_k}{n} \quad (1)$$

$\sum_{k=1}^n d_k$  is the score obtained by incorporated all the 42 items from ICD items and Web Disclosure Index items and  $n$  the maximum score obtainable while taking into account all the items. The autonomy given to the university is divided into three types, Legal Entity state universities, Public Service Agency state university, and private universities (Indonesian Law No. 12 of 2012 concerning higher education), which is measured by using a dummy variable. Score 2 if it is stated as Legal Entity state universities, 1 for private universities, and 0 for Public Service Agency state university. Competitiveness is measured according to the name of Indonesian university stated in the QS World University Ranking 2018. Based on the data acquired from QS World Ranking Universities in 2018, only 9 Indonesian universities are listed in the QS ranking database (Shoeja et al. 2018). Therefore, the measurements of the variable are using dummy scale with a score of 1 if the name of the university is stated in QS World University ranking and 0 if vice versa. Data on higher education institutions age obtained based on the data from the internet as well as official university sites and news released by the university's sample sites. While the data on higher education institutions' number of student was obtained from the Indonesian Directorate General of Higher Education website for the year 2018. Indonesian Directorate General of Higher Education website is the official Indonesian higher education database. The operational of each variable is presented in Table 3.

Table 3. Variable definitions and data source

Variable(s)	Definitions	Data Source
Web-based ICD	GICD Index: a total combined score of IC items (adopted the Tripartite Classification of Intellectual Capital Disclosure Items by Low et al. (2015)), and Web accessibility items	University websites
Autonomy	Dummy variables of whether: included as Legal Entity state universities (Score 0) or Public Service Agency state university or private universities	University websites
Competitiveness	Dummy variables of whether: the name of the university is stated in the QS World University Ranking 2018 or not	QS World University Ranking ( <a href="http://www.webometrics">http://www.webometrics</a> )
Age	Number of years since the established year	University websites
Size	Number of student and lecturer	Indonesian Directorate General of Higher Education website

This paper focuses the relationship of the variables, namely, Autonomy, Competitiveness, Age, Size, as the determinant factors toward Web-based intellectual capital disclosure. Because the model uses more than two independent variables, this study utilizes a multivariate analysis called the multivariate regression model (Wijnhoven et al., 2014). Based on the theoretical model, the following are regression models.

$$\text{Web-based ICD}_{i,t} = \beta_0 + \beta_1(\text{Autonomy})_{i,t} + \beta_2(\text{Competitiveness})_{i,t} + \beta_3(\text{Age})_{i,t} + \beta_4(\text{Size})_{i,t} + \varepsilon_{i,t} \quad (2)$$

Where Web-based ICD is the global intellectual capital disclosure index of the university;  $\beta_0$  is the constant;  $\beta_1$ – $\beta_4$  is the coefficient of the determinants variables (Autonomy, Competitiveness, Age, and Size);  $\varepsilon_{i,t}$  is the error or disturbance terms of university. According to Wijnhoven et al. (2014), a multivariate regression model can be tested by using Warp PLS; therefore, Warp PLS will be utilized in this paper. In determining the result of the hypothesis (reject or accept), t-test should be done. If p-value  $\leq 0.05$  ( $\alpha = 5\%$ ). In addition, if p-value  $\leq 0.10$  ( $\alpha = 10\%$ ), it might at present be considered as weakly significant. At the point when p-value  $\leq 0.01$  ( $\alpha = 1\%$ ), at that point, the outcome is regarded to be significant.

## RESEARCH RESULTS AND ANALYSIS

### Validity and Reliability test

In Table 6, the relationships among variables with the square root of AVE are shown diagonally, and the numbers that are showed in the diagonal section should be the biggest among the other coefficient correlation of latent variables (Kock, 2015). Moreover, the VIFs must be lower than 3.30 or 10 for the relax criteria (Kock, 2015). Table 4 and Table 5 below show that all variables already fulfilled the validity and reliability test.

Table 4. Correlations among Variables with Square Root of AVE

Variable	ICD	AUT	COM	AGE	Lect	Std
ICD	1.000	0.612	0.354	0.168	0.324	0.372
AUT	0.612	1.000	0.489	0.146	0.225	0.174
COM	0.354	0.489	1.000	0.190	0.497	0.412
AGE	0.168	0.146	0.190	1.000	0.420	0.370
Lect	0.324	0.225	0.497	0.420	1.000	0.825
Std	0.372	0.174	0.412	0.370	0.825	1.000

Table 5. Collinearity Values

	Web-based ICD	Aut	Com	Age	Lect* Size	Std*Size
Full collinearity VIFs	1.824	1.958	1.669	1.225	3.637	3.367

### Analysis Result

Table 6 demonstrates the overall information regarding the analysis result of web-based intellectual capital disclosure. As to intellectual capital item classes individually, in average, every higher education institution unveils 16.71 intellectual capital items (67% of absolute intellectual capital items) on its site, with an exceptional focus on internal capital (88% of the overall internal capital items uncovered, in average, by each higher education institution) and trailed by external capital (58 percent) and human capital (56%).

Table 6. Web-based Intellectual Capital Disclosure Analysis Result

	Total Items	Mean	%	Min	Max
Human Capital	8	4.47	56%	0	7



Internal Capital	8	7.06	88%	4	8
External Capital	9	5.18	58%	3	8
<b>Total ICD (content)</b>	<b>25</b>	<b>16.71</b>	<b>67%</b>	<b>8</b>	<b>23</b>
Technology	4	3.17	79%	2	4
Navigability	9	4.67	52%	3	5
Interactivity with user	4	3.84	67%	3	4
<b>Total Web Accessibility Item (presentation)</b>	<b>17</b>	<b>11.69</b>	<b>67.7%</b>	<b>8</b>	<b>13</b>
<b>Total GICD</b>	<b>42</b>	<b>28.40</b>	<b>67.6%</b>	<b>18</b>	<b>36</b>
<b>Indices of Disclosure</b>					
ICD Index		0.67		0.31	0.92
GICD Index		0.68		0.43	0.86

In addition, as can be seen in Table 6, the average mean value of ICD index is 0.67, which is considered as high. It indicates that most of the intellectual capital disclosure item has been disclosed in Indonesian universities' main website, which can also be seen in Table 7. From the perspective of the presentation, which is reflected through web accessibility items, on average, each of the Indonesian higher education university discloses 67.7% from the total of web accessibility items. It is about 11.69 items being disclosed by each of Indonesian universities, where it is dominated by technology items (79% of total technology items is presented on average). Then, it is followed by interactivity with user items (67%) and navigability (52%). The finding is in line with Rossi (2018). It shows how higher education institutions utilize the potential offered by sites for disclosing intellectual capital information; thus, it can enhance the accessibility and understandability of stakeholders.

*Table 7. Web-based Intellectual Capital Disclosure Analysis Result for Each Item*

Intellectual Capital Item Disclosure	% of higher education institutions	0	1	Frequency
<b>External Capital</b>				
1 Brand identity	100%	0	83	83
2 Brand Merchandising	100%	0	83	83
3 Student satisfaction	10%	75	8	8
4 Mobility programs for students	78%	18	65	65
5 Post-graduation, high education and specialization programs	100%	0	83	83
6 University third mission-spin off	48%	43	40	40
7 University third mission research consortia and cluster	71%	24	59	59
8 Students information	5%	79	4	4
9 Graduate students information	6%	78	5	5
<b>Internal Capital</b>				
1 Patent rights	57%	36	47	47
2 Publications	95%	4	79	79

3	Higher education culture	100%	0	83	83
4	Management philosophy	100%	0	83	83
5	Infrastructure facility	100%	0	83	83
6	ICT Infrastructure	88%	10	73	73
7	National research project	96%	3	80	80
8	European and international research project	77%	19	64	64

#### Human Capital

1	Information about Lecturers	54%	38	45	45
2	Information about PhD students	14%	71	12	12
3	Information about PhD courses	92%	7	76	76
4	Information about Research colleagues	80%	17	66	66
5	Staffs' mobility programmes	27%	61	22	22
6	Information about staff administration	59%	34	49	49
7	Internationalisation of lecturers	76%	20	63	63
8	Training programmes	47%	4	39	39

Web Accessibility Item	% of higher education institutions	0	1	Frequency
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#### Technology

1	Download speed of the main website (<10s)	100%	0	83	83
2	Images and Graphs	100%	0	83	83
3	Sound files usage	17%	69	14	14
4	Video files usage	99%	1	82	82

#### Navigability

1	Help button	100%	0	83	83
2	Glossary of terminology	0%	83	0	0
3	Readability (option to change into higher readability mode)	0%	83	0	0
4	Text size (Possibility to change text size )	100%	0	83	83
5	Table of content	0%	83	0	0
6	Internal search engine	72%	23	60	60
7	English language option	95%	4	79	79
8	Multilanguage option (other International language besides English )	0%	83	0	0

#### Visible content menu

1	Visible content menu	100%	0	83	83
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#### Interactivity with User

1	Access and link on library	88%	10	73	73
2	Access and link on social and cultural activities	100%	0	83	83
3	Information about other higher education services, physical exercises, and other items.	100%	0	83	83

Table 6 describes the results of web-based intellectual capital disclosure for each item. In terms of intellectual capital disclosure item, the highest disclose intellectual capital items are: "Brand identity"; "Brand Merchandising"; "Post-graduation"; and "high education and specialization programs" in external capital criteria, and "Higher education culture"; "Management philosophy"; and "Infrastructure facility" in internal capital criteria. It can be seen that all 83 universities fully disclosed these items (100%).

Furthermore, the highest disclosed item in human capital criteria is "Information about Ph.D. courses," with 76 out of 83 (92%) universities disclosed this item. In addition, the lowest disclosed item is coming from "Students information" from external capital criteria with only 4 universities (5%) disclosed it, followed by "Graduate student's information" that is also included in external capital criteria and "Information about Ph.D. students" that is included in human capital criteria.

From the perspective of web accessibility items, the result in technology criteria shows that all of the official websites (100%) owned by Indonesian universities provide fast download speed and incorporated images and graphs inside their websites. In navigability criteria, 100% of the universities have provided help button, possibility in changing the text size, and visible content menu in their websites to improve the convenience in accessing the websites. Meanwhile, 100% of the universities also provide access and link on social and cultural activities and information about higher education activities in their websites to enhance the interactivity with users. Contrarily, in navigability criteria, all of the 83 universities do not provide: glossary of terminology; option to change into higher readability mode; table of content and Multilanguage option. Furthermore, in technology criteria, only 17% of the total university sample provide sound files on their official websites. Table 8 below showed a descriptive analysis of each of the variables, including minimum, maximum, mean, and standard deviation.

*Table 8. Web-based Intellectual Capital Disclosure Analysis Result for Each Item*

Variable	Min	Max	Mean	Std. Deviation
ICD	0.43	0.83	0.707	0.086
AUT	0	2	0.698	0.694
AGE	9	73	49.626	16.061
COM	0	1	0.108	0.312
Std (Size)	342	60,750	19,302.550	12,815.950
Lect (Size)	27	2,616	811.397	582.385

Table 7 shows that the number of students (Std) has a minimum and maximum value of 342 and 60,750, respectively, with a mean value of 19,302.550. In contrast, the number of lecturers has a minimum and maximum value of 27 and 2,616, with a mean value of 811.397. Both have a standard deviation value of 12,815.950 and 582.385, respectively. Meanwhile, autonomy (AUT) has a minimum and maximum value of 0 and 2, and a mean value of 0.698, with a standard deviation value of 0.694. The next variable is age (AGE) with a minimum and maximum value of 9 and 73, respectively, with a mean value of 49.626 and has a standard deviation value of 16.061. Next is the last independent variable, competitiveness (COM), which has a minimum and maximum value of 0 and 1 respectively and a mean with a value of 0.108 with a standard deviation value of 0.312. Furthermore, this paper's dependent variable is web-based intellectual capital disclosure (ICD) with a minimum and maximum value of 0.43 and 0.83, with a mean of 0.707 and has a standard deviation value of 0.086.

*Table 9. Web-based Intellectual Capital Disclosure Analysis Result for Each Item*

Independent Variable	Dependent Variable	Effect Size
Autonomy	Web-based ICD	0.358
Competitiveness	Web-based ICD	0.023
Age	Web-based ICD	0.029

Size (number of student)	Web-based ICD	0.224
Size ( number of lecturer )	Web-based ICD	0.061

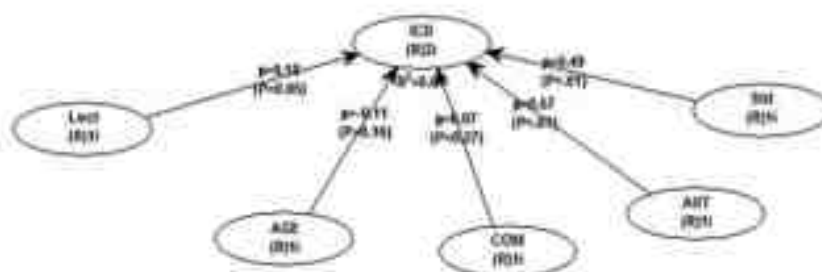
As seen in Table 9, the effect of autonomy on web-based ICD is big; it is 0.358, higher than 0.35. In addition, the effect of the number of student toward web-based ICD is medium, which is 0.224 (higher than 0.15 and lower than 0.35). Meanwhile, the effect of competitiveness on web-based ICD; the effect of age and web-based ICD; the effect of the number of lecturer and web-based ICD are weak (the sizes are in the range of above 0.02 and under 0.15).

Table 10. Web-based Intellectual Capital Disclosure Analysis Result for Each Item

The Effect of Web-based ICD	Dependent Variables (p-values)				
	Aut	Com	Age	Size*Std	Size*Lect
Direct Effect Web-based ICD	0.274*** (<0.001)	0.065 (0.274)	-0.110 (0.160)	0.494*** (<0.001)	0.177** (0.046)

\* p<0.10 (weakly significant); \*\*p<0.05 (significant); \*\*\*p<0.01 (highly significant).

Figure 1. Structural model



Based on Table 10 and Figure 1, the research result shows three hypotheses that are accepted in this study; they are autonomy toward web-based ICD, number of student toward web-based ICD, and number of lecturer toward web-based ICD. Figure 1 shows the result of the direct effect of age (AGE), competitiveness (COM), autonomy (AUT), and size, which is reflected as number of student (Std) and number of lecturer (Lect) to web-based intellectual capital disclosure (ICD). The number of students and the number of lecturer, as the measurement of size, have significant positive effect on the ICD index as the indicators of web-based intellectual capital disclosure. Furthermore, autonomy also has a significant positive effect on web-based intellectual capital disclosure. However, age and competitiveness have no significant effect on web-based intellectual capital disclosure.

## SOLUTIONS AND RECOMMENDATIONS

### Autonomy and Web-based ICD

Autonomy is found to have a positive impact on web-based intellectual capital disclosure. It means the higher the level of autonomy. The result is in line with previous studies (Sánchez et al., 2009; Rahayuningtas and Triana, 2017). The higher the autonomy possessed by a college, the greater the willingness of the high institution to disclose intellectual capital. With the existence of autonomy, universities have the flexibility to manage their institution to encourage higher education institutions to seek more funds that can be obtained from stakeholders. Universities that possess the highest level of autonomy have the highest degree of freedom in managing their institutions, especially in developing

better intellectual capital disclosure, which can be used to attract and manage government funds and public funds (Sánchez, 2009). Legal entity state universities that possess the highest level of autonomy will have better intellectual capital disclosure than private and public service agency universities. It is because state universities possess full independency and a broader source of funds.

Furthermore, legal entity state universities will have better and do more intellectual capital disclosure, resulting in more public and government funds. Moreover, in order to acquire those funds, university needs to provide highly reliable information. Previous studies (Abeysekera, 2006; Dumay and Cai, 2015; Secundo et al., 2016) have stated that conducting traditional ICD through annual reports will cause the emergence of unreliable information because the annual report is not designed to concentrate exclusively on IC reporting. Using web-based disclosure, university can provide greater transparency, reliability, and accessibility in disclosing intellectual capital information with minimum cost (Gallego-Alvarez et al., 2011).

### **Competitiveness and Web-based ICD**

The result of this research shows that competitiveness gives no significant influence on web-based intellectual capital disclosure. Thus, the result of this research is contrary to the previous study (Chen and Chen, 2013). It may due to the awareness for Indonesian universities to compete globally is still low. The number of Higher Education Institutions in Indonesia in 2018 increased to 4,270, consisting of universities, polytechnics, academies, and institutes (Director General of Higher Education, 2014). However, based on QS World University Ranking, from 2015 until 2018, the number of Indonesian universities recognized as higher education that has fulfilled international standards is still 9. Based on the college rankings released by the QS World University Ranking, in 2018 the best ranking that universities were able to achieve in Indonesia was ranked only 277 achieved by the University of Indonesia (UI), even in 2019, the ranking achieved declined to rank 292. It indicates that an increase in the number of tertiary institutions in Indonesia has not been followed by Indonesian universities' awareness to increase their competitiveness. It can be concluded that Indonesian universities do not use web-based intellectual capital disclosure as the primary tool in maintaining or even raising the university's quality that is recognized internationally. The low awareness in increasing competitiveness in a global manner still exists among Indonesian universities.

### **Age and Web-based ICD**

From the statistical point of view, this research shows that age has no significant influence on web-based intellectual capital disclosure. This result is not in line with previous studies (Gallego-Alvarez et al., 2011; Bisogno et al., 2014; Rossi et al., 2018). This inconsistent result is caused by two things: (1) Age is not a mirror of experience and understanding in intellectual capital disclosure. The longer the age of the company does not mean the better level of understanding and experience related to intellectual capital will be achieved, resulting in capital disclosure intellectuals cannot be optimal. (2) Age cannot be used as benchmarks for the extent of intellectual capital disclosure. The functions and roles of government that are less than optimal have mostly occurred in developing countries like Indonesia. It is indicated by higher corruption, collusion and nepotism, ineffective policies and efficient, and bureaucratic malfunctions.

### **Size and Web-based ICD**

Size, which is reflected in the number of student, give highly positive significant influence toward web-based intellectual capital disclosure. It implies that this research is in line with the previous study (Gallego-Alvarez et al., 2011). Furthermore, the new indicator in measuring size, the number of lecturers, shows a similar result as size that is reflected as the number of students. It means the result is in line with the statement of García-Sánchez et al. (2013) that said the number of customers and organizational workers should be included as the indicator in measuring size. If it is related to the university perspective,

the number of students is the customer, and the lecturer is the organizational worker. Therefore, it can be concluded that the more number of student and lecturer own by the university the higher education do more web-based intellectual capital disclosure. The reason is that larger universities possess a more extensive number of audiences, resulting in the need to maintain their institution images through intensive disclosure on the internet (Gallego-Alvarez et al., 2011). In addition, bigger public entities are more politically noticeable and are liable to more prominent outer impacts from their stakeholder network, such as citizens, governments, and understudies (Gallego-Alvarez et al., 2011; Garcia-Sánchez et al., 2013; Rossi et al., 2018)

## CONCLUSION

This research aims to examine the determinant factors that may influence web-based intellectual capital disclosure of Indonesian universities. Besides, this study also discusses web-based intellectual capital disclosure, as the new method in disclosing intellectual capital, may overcome the limitation of traditional intellectual capital disclosure. The sample used in this research comes from Indonesian higher education institutions, which have A-accreditation and has official websites. The total number of the sample that fulfills the sampling criteria are 83 Indonesian universities. The observation period is one year, which is the 2018 period. Independent variables that are incorporated in this research are autonomy (divided into three levels: legal entity state university, public service agency state university, and private university), competitiveness (QS World University Ranking), age, and size (number of student and number of lecturer). The dependent variable used in this paper is web-based intellectual capital disclosure (intellectual capital disclosure item and web accessibility item).

The result of this research shows that there is evidence about the usage of web-based intellectual capital disclosure done by Indonesian universities. Furthermore, autonomy and size have a positive impact toward web-based intellectual capital disclosure, while age and competitiveness give no significant effect to web-based intellectual capital disclosure. Based on the statistical result, autonomy gives the highest contribution to web-based intellectual capital disclosure, among other determinant factors displayed through the effect size of autonomy on web-based intellectual capital disclosure. The reason is that autonomy provides freedom for universities in managing their institution in order to develop better intellectual capital (core competitiveness for university), resulting in attracting more government and public funds.

This paper also suggests that university management can utilize its autonomy by increasing intellectual capital disclosure through websites. The university may take advantage of attracting more public and private funds. Displaying the information regarding university's size through the number of students and lecturers can also enhance web-based intellectual capital disclosure that can help university gain more students and lecturers. For the university stakeholders, the web-based intellectual capital disclosure can increase the understanding and reliability of the information about university performance. Furthermore, it can enhance the accessibility and presentation regarding the information about intellectual capital disclosure done by higher education institutions through the website.

Some limitations might affect the study of the research; these limitations are described to improve further studies. The first limitation of this study is regarding the R Square. The R Square number is considered low, showing that future studies may add other variables to explain universities' interest in applying web-based ICD. Also, the number of samples used is still too small compared to the number of universities in Indonesia. Another limitation of this study is that it only covers Indonesian universities as the sample for the research. Future studies could be improved by doing benchmarking with universities in other countries. When this is included, a better comparison can be drawn up too in terms of comparing universities based on its reputation and how it impacts towards web-based intellectual capital disclosure in the global scope.

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