The Role of Intellectual Capital on Public Universities Performance in Indonesia

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ABSTRACT

Intellectual capital is anticipated as the key factors that could contribute to universities performance and create value for globally competitive advantage. Accordingly, this study investigates the role of intellectual capital and its elements: namely human capital, structural capital and relational capital, on the public universities performance in Indonesia. A total of 177 respondents representing from 8 top public universities in Indonesia were involved in the study. The Partial Least Square (PLS) was used to test the hypotheses. The result found that there was a significant relationship of Intellectual Capital (IC) and its elements on universities performance. Conclusively, it is wise to recommend to the university to invest in intellectual capital consisting of human capital, structural capital and relational capital. Also, these elements should be used as a new model for measurement of the university or higher education institution performance so that it provides added value to strengthen their competitiveness ability.

Keywords: Human capital, intellectual capital, relational capital, structural capital, universities performance

INTRODUCTION

Higher educations in Indonesia have grown rapidly since last decades. As reported by the Ministry of Research, Technology and Higher Education, Republic of Indonesia (2015), the number of public and private higher education institutions in Indonesia increased about 18% and 5.39%, respectively from the year 2005 to 2011. The increment of higher education institutions in Indonesia

has created a new paradigm that leads the university's orientation, i.e. not only have to be able to compete at the national level, but at the global level as well. Besides, the Indonesian higher education sector is also facing a number of changes that directly affect the conceptualisation and function of universities. The most important changes are reformation and modernisation of their education systems in relation to presenting new information that is necessary for stakeholders such as governments, funding agencies, researchers, students, eventual partners. Hence, the Indonesian government has determined the rank of a university in the list of the world ranking university as one of the tools to measure the achievement of the performance quality of universities in the country and to sustain their competitiveness.

The existence of intellectual capital (IC) is believed to play the important role to enhance the performances of universities. Consequently, intellectual capital should be given a great attention by the universities performance in achieving their goals. The universities in European countries such as Austria, UK, Spain and Hungary have been well-organised in reporting intellectual capital since few decades as revealed in the literatures (Benzhani, 2010; Cañibano & Sánchez, 2009; Córcoles, Peñalver, & Ponce, 2011; Fazlagic, 2005; Leitner, 2002; Sánchez & Elena, 2006; Ramírez & Gordillo, 2014; Veltri, Mastroleo & Schaffhauser-Linzatti, 2014).

Although many studies have been conducted concerning intellectual capital and organisation performances, however,

specific studies focusing on the relationships between the variables of intellectual capital and university performance in the research literature is rare. Currently, only studies conducted by Lu (2012) in Taiwanese universities and Meihami and Karimi (2014) in Iraqi universities were revealed in the research literature. Similarly, in the case of Indonesia, the research on intellectual capital in universities is very scarce and is a piecemeal study. Puspitahati, Ulum, and Prasetyo (2011) studied on the intellectual capital reports of the university's official website that won the QS-Star framework, which was actually built for the items IC of European universities (Leitner, 2002). Also, another study reported by Ulum (2012), who utilised the items of intellectual capital based on the items published by Leitner (2002) and combined with the guidelines accreditation programme by the Indonesian Universities Accreditation Institution (BAN-PT). Sadalia and Lubis (2015) also examined discriminant analysis of intellectual model (organisation culture and corporate governance) of a state university in Medan city, Indonesia; nonetheless, the sample was too limited to make a generalisation for Indonesian conditions.

Conclusively, the previous studies in Indonesia are limited to a descriptive research, and have no framework and conceptualisation model developed comprehensively to examine the relationship between intellectual capital and universities performances. Thus, this study was made to examine the empirical effects of intellectual capital e.g. human capital, structural capital,

and relational capital on the performance of public universities in Indonesia. The study would hopefully prove empirically a model to measure the performance of public universities in Indonesia and its relation with intellectual capital.

Literature Review

Performance is an important element in the university, which can be used as a measurement of the university achievement. Measuring university performance is made on the basis of academic excellence achieved. In line with the paradigm shift of higher education in the globalisation era, the university has to change the orientation from a "national, analogue, industrial economy" to one that is "global, digital and information-based" as stated by Hughes (2013). Facing these challenges, Indonesian universities should enhance their performances both in academics and management. Performances measurement has increasingly pushed a call for accountability in higher education. However, there are still few frameworks of universities performances measurements have been developed. Many performances measurement frameworks are originated from private sectors for purposely getting profits. An attempt has been made by Wang (2010), who claimed that the universities performance could be measured from education and research aspects, which are in line with the university roles and functions.

Intellectual capital is the most important strategic and significant assets towards organisational performance in various field and perspectives (Abadulai, Kwon, & Moon, 2012; Gruian, 2011; Hashim, Osman, & Alhabshi, 2015; Khalique, Shaari, Isa, & Samad, 2013; Vishnu & Gupta, 2014; Wang, Wang, & Liang, 2014). The university is an organisation, thus it provides the avenue for IC investigation since IC is so important to universities (Jones, Meadow, & Sicilia, 2009). Universities yield knowledge, also within scientific technical research such as the results of investigation, publication, or across teaching e.g. students trained and productive relationships with the stakeholders (Ramírez & Gordillo, 2014). Universities organisations are, therefore, the best framework for the presentation of ideas associated with the intellectual capital theory (Paloma, Sánchez, & Elena, 2006). Public universities confronted with the increased demand of government as owners and citizens as stakeholders for transparency regarding the use of these funds expose about the social and economic outcomes of universities, and they join forces with other research institutions, private or public organisations, or even participate in international research networks (Leitner, 2005). The academic community, as well as the universal community, assumes that the intellectual capital of a university must obtain the highest levels of quality and does not require any kind of intervention. However, the reality falsifies this statement and today's universities are in slow progressing to innovate (Fazlagic, 2005). Public universities do not have owner structure like private organisations, and consequently, they do not need to produce the kind of annual reports required by

commercial law, but they have to implement financial accounting systems (Leitner, 2005).

There is a lack of literature that supports the impact of intellectual capital on performance in the education sector. However, studies reported by Lu (2012), and Meihami and Karami (2014) showed that the intellectual capitals had a significant impact on universities performance. From a theoretical perspective, the resource based view theory assists a manager knowing that the resources of the organisation can be noticed as organisations' most essential asset, and at the same time he is also valuing those assets to increase organisation's performance. The above arguments support the statement that intellectual capital plays an important role to increase the organisational performances of universities.

According to Bontis (1999) and Kong (2007), human capital, structural capital, and relational capital are the component of the IC framework for the non-profit organisation. In addition, other scholars in the non-profit management area have agreed that IC includes three primary interrelated non-financial elements such as Stewart (1997), Roos, Roos, Dragonetti, and Edvinsson (1997), Van Buren (1999), Bontis, (2001), Fletcher, Guthrie, Steane, Roos, and Pike (2003), and Grasenick and Low (2004). Intellectual capital of universities is represented as being formed by three basic and closely interrelated components e.g. human capital, structural capital and relational capital. The elements of a university's intellectual capital have

been classified in varying ways, although certainly it is the tripartite classification that is most widely accepted in specialised literature (Benzhani, 2010; Córcoles et al., 2011; Leitner, 2005; Cañibano & Sánchez, 2009).

Human capital is defined as human capital associates to employee's knowledge, competencies, skill, capability and innovation; and various resource elements attitude and intellectual agility, tacit knowledge, talents of people, (Khalique, Shaari, Isa, & Agel, 2011). Many studies have shown the significant relationship between human capital and organisation performance (Abadulai et al., 2012; Ajisafe, Orifa, & Balagun, 2015; Jamal & Saif, 2011; Stiles & Kolvisaechan, 2003; Wang & Chang, 2005) as employees provide the quality of service while implementing internal processes, their capability would affect process efficiency, quality, and customers' satisfaction. Córcoles et al. (2011) indicated that the main purpose of the university was to produce and diffuse knowledge, with the university's most significant investment being academic research and human resources. The study (Lu, 2012; Amin, Ismail, Rasid, & Selamani, 2014) found that human resource such as recruitment, training, performance appraisal, career planning, employee participation, job definition, and compensation had a significant relationship with university performance.

The second element of IC is structural capital, which is meaningful to the system and structure of an organisation. Structural

capital is the valuable strategic assets of organisational which consists of hardware, software, databases, organisational structure, patents, trademarks, information systems, copyrights, company images, system policies and procedures, routines and others that employees use to support their business activities and processes, (Khalique et al., 2011; Wang et al., 2014). Generally, the structural capital of organisations comprises of infrastructure, system policies, and procedures, (Khalique, et al., 2011). According to Pablos (2004), Sharabati, Jawad, and Bontis, (2010), and Stevens (2011), structural capital mainly provides the environment that supports individuals to invest their human capital in creating the innovation and development, technology, quality management, creativity and organisational and leverage its knowledge to enhance organisational performance.

Structural capital cannot live without human capital. These assets must work in hand with structural capital. The mere creation of knowledge by individuals is useless without a structure to determine how that knowledge leads to better products. The consideration that characterises public university's operation direction, university's funds and the operating expenditure of the schools in teaching, research, education, and training, guidance and assistance. These factors serve to strengthen internal organisational and energise research and teaching (Lu, 2012). The above arguments indicate that structural capital performs an essential role in confirming that education institutions have the academic excellence to offer future leaders.

The last element of IC is relational capital, which represents an organisation's relations with its external stakeholders and the perceptions that they hold about the organisation, as well as the exchange of knowledge between the organisation and its external stakeholders (Cegarra-Navarro & Sánchez-Polo, 2010; Lopes-Costa & Munoz-Canavate, 2015; Wang et al., 2014). Similarly, relational capital is defined as an invisible asset based on developing, maintaining and nurturing high-quality relationships with any organisations, individuals or groups that influence business performance. Within this new economic model, it is clear that universities have begun to explore how to profit from the knowledge that they possess as educational institutions (Lu, 2012). Except for revenue enrolled students, university management has largely adopted efforts to leverage their knowledge into additional revenue through providing services for external schools such as training and studying. It is the quality of relational capital that translates into revenue for an organisation (Thursby & Kemp, 2002). If a university has a strong relationship with numerous customers, it is likely that the university will continue to be profitable. Based the above discussion, the study proposes the following hypothesis:

H1: There is a relationship between intellectual capital and the public universities performance in Indonesia.

H1a: There is a relationship between human capital and the public universities performance in Indonesia.

H1b: There is a relationship between structural capital and the public universities performance in Indonesia.

H1c: There is a relationship between relational capital and the public universities performance in Indonesia.

METHOD

A total of 177 respondents who were leaders of the universities and their faculties participated in this study. The respondents were taken from 8 (eight) Indonesian public universities, which were listed under the QS World University Rankings in the periods of the year 2014 and 2015. A questionnaires survey technique through online survey was used to obtain the data from the respondents from the listed universities. The respondents involved in the study were Rector, Vice Rector, Dean, Vice Dean and Head and Secretary of Departments and lecturers. They were purposely chosen since they knew more about their institutions. From the demography data, a total of 122 respondents (68.9%), who participated in the study were male, while the rest were female. Despite the majority of respondents were male, the responds are still representable for this study because this study does not aim to differentiate between the respondents of genders. All the questionnaires were sent to all email addresses available in the sample universities. The compositions of the gender of the respondents were just known after they convey responses in questionnaires delivered through the online survey. The majority of the respondents aged between 40-49 years old (65 respondents or 36.7%) of the total number of respondents. Meanwhile, about 61.5% or 109 respondents were Ph.D. degree holders. Based the position held, 110 or 62.1% of the total respondents worked as lecturers, forming the biggest percentage or the highest number, followed by the heads of programmes (27 respondents or 15.3%) of the total number of respondents. There were 68 respondents (38.4%) with more than 8 years working experiences as either the university leaders or lecturers in universities. They are the respondents with a doctorate degree and are able to understand and answer all the research instruments as expected in the study.

Research Instruments

Intellectual Capital. Intellectual capital in university is a term used to cover all the organisation's non-intangible or non-physical assets, which include processes, capacity for innovation, patents, the tacit knowledge of its members and their capacities, talents, and skills, society's recognition, a network of collaborators and contacts. The instrument to measure intellectual capital consists of human capital, structural capital and relational capital, which are adopted from Córcoles et al., (2011).

Human Capital. Human capital is the sum of the explicit and tacit knowledge of the university staff e.g. teacher, researcher, manager, administration and service staff acquired through formal and non-formal education and refresher processes

included in their activities such as attitude, capabilities, skill and the innovative, and talent. A total of 12 item questions were delivered for human capital.

Structural Capital. Structural capital is the explicit knowledge relating to the internal process of dissemination, communication, and management of the scientific and technical knowledge at the university. A total of 13 item questions were delivered for structural capital.

Relational Capital. Relational capital is the extensive collection of economic, political and institutional relations developed and upheld between the university and its non-academic partners i.e. enterprises, non-profit organisations, local government and society in general. It also includes the perception other have of the university, its image, appeal, and reliability. A total of 16 item questions were delivered for relational capital. The measurement of instrument consisted of 1 to 5 Likert scales, where 1-scale is for "not at all important" and 5-scale says that "it is very important".

University Performance. Griffin (2003) defined organisational performance reflected the ability of an organisation to fulfil its stakeholders' requirements and survived in the market. It is also known as the outcome of the actions or activities carried out by the members of the organisation to measure how well an organisation has accomplished its objectives. It can be measured by the extent to which each of university functions

is maintained toward the university goals. This study uses the university organisational performance measurement by Wang (2010). The measurement method was chosen because this method has a multidimensional performance measurement including aspects of academic and performance. The academic performance dimension can be further divided into research and educational dimensions. The management performance dimension can be further divided into financial and human resource dimension. Measurement of academic research performance consists of 12 questions, while 14 questions were used to measure the academic education performance. Measurement of financial management performance consists of 5 questions, while 10 questions were given to measure the human resources management performance. Similarly, the respondents were asked to evaluate their universities performances based on the given Likert Scale as mentioned earlier.

Hypothesis Testing

The Partial Least Square (PLS) approach with WarpPLS program version 3.0 was used to test the hypothesis. This approach has several advantages as stated by Hair, Hult, Ringle, & Sartstedt, (2013) and Kock (2014). Firstly, SEM-PLS is suitable for this research model that uses variables that cannot be measured directly (latent variables) and has predicted measurement error. Secondly, analysis of SEM-PLS can simultaneously test multiple dependence and independence variables as used in this

research model. Thirdly, component-based SEM-PLS can overcome complexity models with small sample sizes.

RESULTS

The SEM-PLS consisting of two sub-models of measurement is often called outer models and structural models or inner models. The first step in data analysis with SEM-PLS approach is validity and reliability test. Testing the validity with the reflective indicator was measured through convergent validity and validity discriminant. Testing reliability for reflective construct was measured by Cronbach alpha and composite reliability based on Kock (2014). Meanwhile, testing construct validity and reliability are not required for the formative indicators. This can be made by looking at the weight of indicator only. This indicator should be statistically significant and multicollinearity of variance inflation factor (VIF) should be

smaller than 3.3. Table 1 summarises the results of validity and reliability testing for reflective constructs. Overall, the results of measurement model (outer model) reflective constructs have met the criteria, so that it can proceed to the inner model or structural models. The results of this study show a loading range of 0.593 to 0.861 and agree with Hair et al., (2013), who stated that the loading between 0.40-0.70 should be taken into consideration and retain for a newly developed questionnaire. Based on criteria of each variable cross loading should be greater than 0.70, hence it also met the criteria as discriminant validity in Table 2.

The formative construct of the WarpPLS program just looked at the significance of weight indicators with criteria p value less than 0.05 and VIF (variance inflation factor) of less than 3.3 (Kock, 2014) are presented in Table 3.

Table 1

Conclusions from the results of the validity and reliability (outer /measurement model) testing

Construct	Validity		Reliability		Full Collinearity VIF
	Loading Range	AVE	Composite Reliability	Cronbach Alpha	
Rule of thumb	> 0.5	> 0.5	> 0.7	> 0.7	< 3.3
Intellectual Capital (IC)					
Human Capital (HC)	0.622-0.782	0.510	0.838	0.757	2.107
Structural Capital (SC)	0.640-0.794	0.510	0.912	0.892	1.994
Relational Capital (RC)	0.599-0.798	0.513	0.904	0.879	1.713
University Performance					
Academic Research (PR)	0.674-0.809	0.551	0.936	0.925	1.841
Academic Education (PE)	0.583-0.861	0.548	0.856	0.789	1.469
Management Financial (PF)	0.794-0.839	0.663	0.908	0.873	2.288
Management Human Resources (PH)	0.593-0.753	0.503	0.901	0.876	2.044

Table 2
Result of discriminant validity

Construct	Human Capital	Structural Capital	Relational Capital	University Performance			
				Academic Research	Academic Education	Financial Management	Human Resources Management
Intellectual Capital							
Human Capital	0.714						
Structural Capital	0.644	**0.714**					
Relational Capital	0.588	0.548	**0.716**				
University Performance							
Academic Research	0.209	0.216	0.251	**0.742**			
Academic Education	0.260	0.230	0.285	0.390	**0.740**		
Management Financial	0.132	0.074	0.194	0.596	0.453	**0.815**	
Management Human Resources	0.205	0.214	0.243	0.532	0.440	0.672	0.709

Table 3
Results of formative construct testing

Constructs	P value	VIF
Rule of thumb	< 0.05	< 3.3
Intellectual Capital		
lv_HC	<0.001	2.052
lv_SC	<0.001	1.921
lv_RC	<0.001	1.639
University Performance		
lv_PR	<0.001	1.658
lv_PE	<0.001	1.336
lv_PF	<0.001	2.200
lv_PH	<0.001	1.976

Convergent validity testing for each construct indicated that there are several indicators that should be dropped. Indicators dropped since they were not fulfilling the test criteria of convergent validity and value AVE (average variance extracted) with terms of greater than 0.05. The number of indicator questions given to the respondent before the convergent validity testing were 82 items questions, as summarised in Table 4 and Table 5. After testing, the eventual number of valid and reliable indicators was 55 that could be used to test the hypothesis as indicated in Table 6. The indicators did not fulfill the test criteria convergent validity and value AVE (average variance extracted) was 27 of the 82 indicators used to measure latent variables.

Table 4
Item questions for variables of intellectual capital

Intellectual Capital	Item questions
Human capital	Typology of university staff (historical data on the increase and decrease of staffing number, staff age structure, type of contracts, etc. (HC1)
	Teaching and research staff academic and qualifications (HC2)
	Mobility of teacher and researcher (HC3)
	Scientific productivity (books) (HC4)
	Teaching and research professional qualifications (HC5)
	Mobility of graduate students (HC6)
	Efficiency of human capital (HC7)
	Teaching capacities and competence (HC8)
	Research capacities and competence (HC9)
	Capacity for teamwork (HC10)
	Leadership capacity (HC11)
	Training activities (HC12)
Structural Capital	Installations and material resources supporting pedagogical qualification and innovation (SC13)
	Installations and material resources supporting research and development (SC14)
	The institution's assessment and qualification processes (SC15)
	Organisational structure (SC16)
	Teaching management and organisation (internal communication of result, periodical exchange with foreign teachers, teaching incentives, etc.) (SC17)
	Research management and organisation (internal communication of results, efficient management of research projects, research incentives, these reads, etc.) (SC18)
	Organisation of scientific, cultural and social events (SC19)
	Productivity of the administration, academic and support services (SC20)
	Organisation culture and values (SC21)
	Efforts innovation and improvement (expenditure on innovation, staffing level, etc.) (SC22)
	Management quality (SC23)
	Information system (document processes, database, ITC use, etc.) (SC24)
	Technological capacity (total expenditure on technology, availability, and use of computer programmes, intranet/internet use, etc.) (SC25)
Relational capital	Effectiveness of graduate teaching (average duration of studies, dropout rate, graduation rate, etc.) (RC26)
	Student satisfaction (RC27)
	Graduate employability (RC28)
	Relations with students (capacity of response to student's needs, permanent relations with graduates, etc.) (RC29)
	Relations with the business world (spin-off, R&D contracts and project, etc.) (RC30)
	Relations with society in general (institutional representation in external organisations, collaboration in national and international projects, etc.) (RC31)

Table 4 *(continue)*

Intellectual Capital	Item questions
Relational capital	Applications and dissemination of research (dissemination of result, social appropriateness of research) (RC32)
	Relations with media (RC33)
	University image (RC34)
	Collaborations and contacts with public private organisations (RC35)
	Collaboration with order universities (RC36)
	Strategic links (RC37)
	Relations with quality institutions (RC38)
	The regional, national, and international reputation of the university (RC39)
	Social and cultural commitment (RC40)
	Environmental responsibility (RC41)

Source: Ramírez and Gordillo (2014)

Table 5
Item questions for university performances

University performances	Item questions
Academic Research Performance	Number of researchers / FTE (*Full Time Equivalent*) by Ph.D. students, academic staff (PR48)
	Number of researchers from sponsors (PR49)
	Number of successful research grant applications (PR50)
	Number of Strategic Partnerships (PR51)
	Number of publications by research unit (PR52)
	Number of doctorate conferred (PR53)
	Exploitation of IP (PR54)
	Number of successful entrepreneurs (start-up companies) (PR55)
	Number of citations publications that have been published in journals with high impact (PR56)
	Membership of research council or editorship of journal (PR57)
	Award various reasons (PR58)
	Research ranking or research assessment by peer review (PR59)
Academic Education Performance	Total revenues undergraduate program (bachelors and post graduate, master and Ph.D.) and international student admission (PE60)
	Number of degree programmes (PE61)
	Number of students per degree programme (PE62)
	Number of honour degrees (PE63)
	Number of permanent academic staff (PE64)
	Ratio of full-time students/academic staff (PE 65)
	Percentage of students who progressed after the first year of study (PE66)
	Percentage of students who dropped out due to various reasons (PE67)
	Average contact hours per week to increase the performance of students (PE68)

Table 5 *(continue)*

University performances	Item questions
Academic Education Performance	Students' evaluation in measuring their satisfaction level through surveys (PE69)
	Average time for completing bachelors, research and non-research masters programmes/students graduated on time for bachelors, research and non-research masters programmes (PE70)
	Percentage/rate of graduation as a result of university's educational services (PE71)
	Number of diplomas issued (PE72)
	Total acceptance of employment of graduates (PE73)
Financial Management Performance	Total amount of research income (PF74)
	Share in third-party funding and share in governmental funding to university (PF75)
	Income from tuition fees and other services (PF76)
	Annual surplus/deficit as the percentage of income from accounts (PF77)
	Annual expenditure on facilities, library and sports facilities etc.(PF78)
Human Resources Management Performance	Percentage of full-time recruitment (PH79)
	Percentage of English speaking employees (PH80)
	Number of Ph.D. students (PH81)
	Number of Professors (PH82)
	Number of assistant professors with or without Ph.D. (PH83)
	Number of lecturers (PH84)
	Number of support staff (PH85)
	Academic to non-academic staff ratio (PH86)
	Annual expenditure on training and development (PH87)

Source: Wang (2010)

Table 6
Summary indicators dropped

Latent Variables	Early	Drop I	Drop II	Drop III	Drop Total	Finally
Intellectual Capital (IC)						
Human Capital (HC)	12	3	4	-	7	5
Structural Capital (SC)	13	3	-	-	3	10
Relational Capital (RC)	16	4	3	-	7	9
University Performance						
Academic Research (PR)	12	-	-	-	-	12
Academic Educational (PE)	14	5	3	1	9	5
Financial Management (PF)	5	-	-	-	-	5
Human Resources Management (PH)	10	1	-	-	1	9
Total	82	16	10	1	27	55

Results of Hypothesis 1 Testing

Assessing the structural models with PLS is started by looking at the value of R-Squares for any endogenous latent variables as the predictive power of the model structural. Figure 1 shows the result of the structural model with the value of standardized path coefficient of intellectual capital to university performance was 0.35. This value is significant at a p-value less than 0.001. The value of R^2 was found to be 0.12. Also, the value of R^2 (R-Square) of 0.12 is considered weak (Chin, 1998). This result means that only 12% of the performance university (PU) variances can be explained by the variance of intellectual capital (IC). According to Chin (1998), R-Square can be grouped into three categories of weak (0.19), moderate (0.33) and large (0.67).

Table 7 shows results of correlation coefficient value of intellectual capital (IC) to the university performance (PU) is approximately 0.349 (rounded to the image output becomes 0.35) and significant at 0.001. The output shows that the hypothesis is accepted. This means that the intellectual capital significantly influences university performance. In other words, it can be said the higher the transparency of the publication of intellectual capital of an organisation, the higher the university performance. Evaluation the PLS model with WarpPLS can give effect size, in which the f-squared effect size was conducted to determine the model goodness (Cohen, 1988). Effect size is calculated as the absolute value of the individual contribution of each predictor on the latent variables
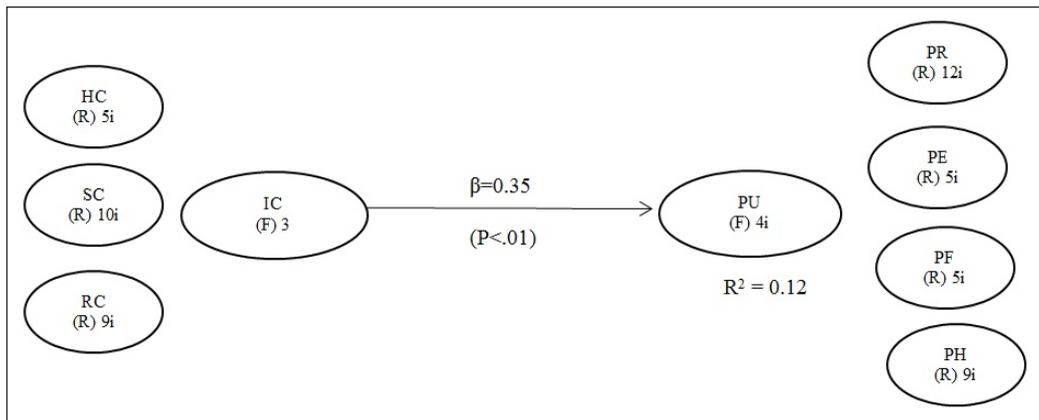
Figure 1. The result of structural model for hypothesis 1 testing

Table 7
Output path coefficients for hypothesis 1

Path coefficients	Standard Errors	Effect Sizes	Path coefficients values	p-values	Result of hypothesis
IC → PU	0.064	0.122	0.349	<0.001	H1 Supported

R-Squared value criterion variables. Effect size can be grouped into three categories of weak (0.02), medium (0.15) and large (0.35).

The result of effect size estimation of the intellectual capital value on university performance was 0.122 and categorized into medium effect size group. This means that the effect of intellectual capital has an important influence in the organisation based on practical point of view by (Cohen, 1988).

Results of Hypothesis 1a Testing

The value of standardized path coefficient of human capital to university performance was 0.27 and significant at a p-value less than 0.001 (Figure 2). The obtained value R^2 is 0.07 and it falls into a relatively weak group R^2 based on Chin (1998). Table 8 shows the output of correlation coefficient values track human capital (HC) on university performance (PU) was approximately 0.272 (rounded to the output image to be 0.27) and significant at 0.001. The output shows that the hypothesis H1a is accepted. Thus, human capital (HC) significantly influences the university performance (PU).

The result of estimated effect size value of human capital (HC) on university performance (PU) is 0.074. This result falls into relatively weak group effect size and indicates that the effect of human capital disclosure has less important influence from a practical point of view (Cohen, 1988).
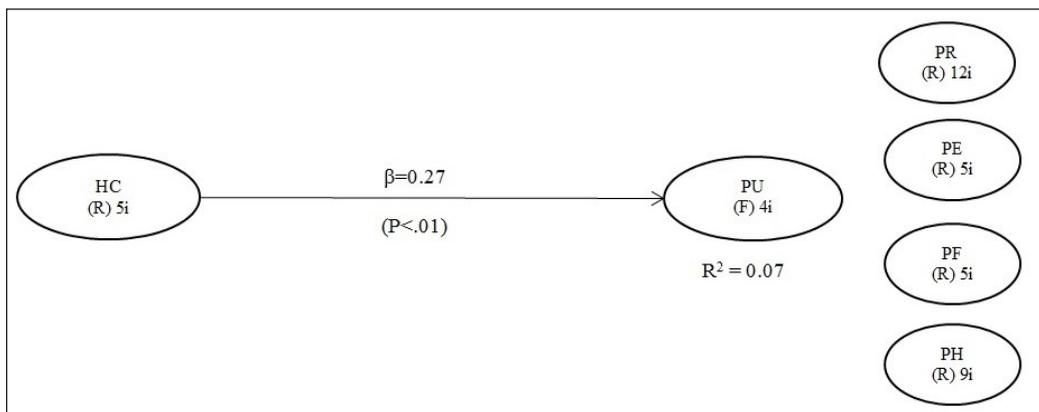
Figure 2. Results of structural model for hypothesis 1a testing

Table 8
Output path coefficients for hypothesis 1a

Path coefficients	Standard Errors	Effect Sizes	Path coefficients values	p-values	Result Hypothesis
HC → PU	0.067	0.074	0.272	<0.001	H1a Supported

Results of Hypothesis 1b Testing

The value of standardized path coefficient of structural capital (SC) to university performance (PU) was equal to 0.237 (rounded to 0.24) and significant at a p-value less than 0.001 (Figure 3). The R^2 value is found to be 0.06 is categorised as the outcome in a relatively weak group R^2 based on Chin (1998).

Table 9 shows path coefficient values of structural relationship capital (SC)

on university performance (PU) was approximately 0.237 (rounded to the output image becomes 0.24) and significant at 0.001. The output shows that the hypothesis H1b is acceptable. The estimated value of effect sizes of structural capital (SC) on university performance (PU) was 0.056 and falls into relative weak group effect size. This indicates that the effect of structural capital has less important influence from a practical point of view Cohen (1988).
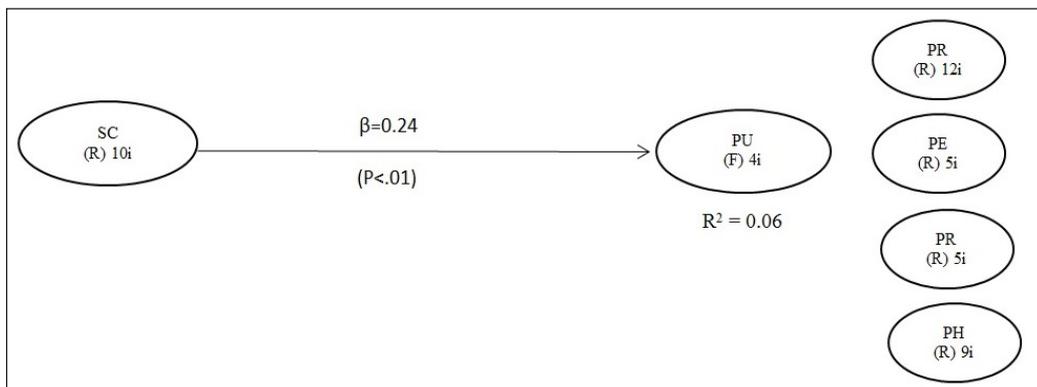
Figure 3. Results of structural model for hypothesis 1b testing

Table 9
Output path coefficients for hypothesis 1b

Path coefficients	Standard Errors	Effect Sizes	Path coefficients values	p-values	Result Hypothesis
SC → PU	0.068	0.056	0.237	<0.001	H1b Supported

Results of Hypothesis 1c Testing

The value of standardized path coefficient of relational capital (RC) to university performance (PU) was 0.31 and significant at a p-value less than 0.001. The obtained value R^2 was 0.09 as indicated in Figure 4.

Table 10 shows the path coefficient values of relational relationship capital (RC) to the university performance (PU) was approximately 0.306 (rounded to the output image becomes 0.31) and significant at 0.001. The output shows that the hypothesis H1c is acceptable. Thus,

relational capital significantly affects the university performance. The estimated value of the effect size of the university performance to relational capital is 0.094 and falls into a relatively weak group effect size. This indicates that the influence of relational capital is less important than from practical point of view (Cohen, 1988).
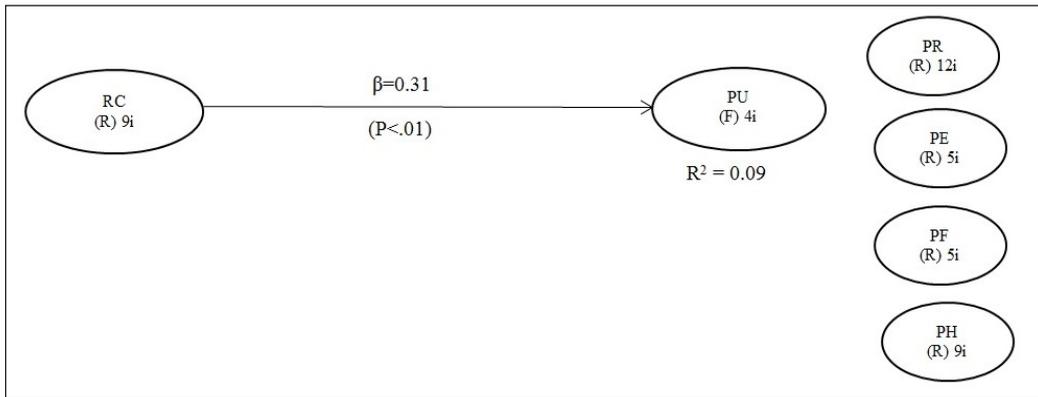
Figure 4. Result of structural model for hypothesis 1c testing

Table 10
Output path coefficients for hypothesis 1c

Path coefficients	Standard Errors	Effect Sizes	Path coefficients values	p-values	Result Hypothesis
RC → PU	0.065	0.094	0.306	<0.001	H1c Supported

DISCUSSION AND CONCLUSION

The research had explored the effects of intellectual capital as well as the elements of human capital, structural capital and relational capital on the performance of public universities in Indonesia. This study has successfully proven that intellectual capital is one of the important factors that affect the performance of the university through the modern management of the elements of intellectual capital such as human capital, structural capital and relational capital at public universities in Indonesia. This finding is consistent with Gruian (2011), Lu (2012), Khalique et al. (2013), Meihami and Karami (2014), and Hashim et al. (2015), who stated that it was important for organization to provide appropriate information on their intellectual capital, so that the information could be more effective and relevant, and gave impact to universities performance. This study also found that there is a relationship between human capital and the performance of public universities. This finding is also supported by the previous studies as reported by Khan (2010), Jamal and Saif, (2011), Lu (2012), Amin et al., (2014), and Zlate

and Enache (2015) who mentioned that aspiration to be an excellent university only could be achieved by strongly support by excellent human capital included academic and professional staff. Particularly in Indonesia, an achievement to becoming a World Class University is very important as it is the aspiration in the globalisation era. Thus, this study also proved that structural capital gave significant effects on university's performance. This result also supports the findings of previous researchers such as Wang and Chang (2005), Sharabati et al. (2010), Khalique et al. (2011), Wang et al., (2014), and Hashim et al. (2015), who indicated that structural capital was the most significant investments in a university. Relational capital is a component of intellectual capital that significantly contributes to the universities' performance in Indonesia. This study confirmed the previous research by Stewart (1997), Thursby and Kemp (2002), Wang and Chang (2005), Sharabati et al. (2010), Stevens (2011), Khalique et al. (2013), Hashim et al. (2015), and Vishnu and Gupta (2014), who said that building a partnership with outside parties or bodies, had improved the university performance. The results also encourage the university to have strong relationships both in academic and non-academic aspects with other parties. Generally, the study had demonstrated empirically a model to measure public university performances in Indonesia in the intellectual capital. As a recommendation, a great attention is needed for universities in Indonesia to ensure the transparency of information from these institutions by building a transparency and accountability information, so that it drives the management to understand the need of intellectual capital.

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