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Analysis of Intellectual Capital Effect on Public University Performance in Medan

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Abstract
The purposes of this study are: 1) the effect of intellectual capital on the performance of a public university in the city of Medan, 2) the effect of human capital, structural capital and relational capital on the performance of public universities in the city of Medan. This study uses action research method. Data processing method used is the method of discriminant analysis and Structural Equation Model (SEM). The results showed that intellectual capital, especially human capital has a role or influence on the performance of a public university in the city of Medan. Human capital has highly significant positive effect on the performance of public universities in the city of Medan. Meanwhile, structural capital and relational capital have negative effect on the performance of public universities in the city of Medan. Intellectual capital, with regard to the three responsibilities of higher education, is more related to performance measurement of lecturer as an element of human capital that will affect the performance of the universities in the city of Medan so that intellectual capital which is formed can give value to the quality of each public university and can serve as benchmarks of the performance of a public university.

Keyword: intellectual capital; human capital; structured capital; relational capital; work performance

1. INTRODUCTION
Global competition at the present time has already applied to education. The biggest challenge for universities in Indonesia is that the level of competition between universities, both public and private is getting higher. Higher Education as one of the formal educational institutions is increasingly required to prepare young people to become human as expected, the man of faith and piety to God Almighty, noble character, have the knowledge and skill, physical and spiritual health, independent and have a sense of civic responsibility and nationality. The purpose is in line with the aim to deliver high quality graduates that are able to fill the need for experts and professionals in a variety of fields of work.

In Indonesia, the role of universities in providing higher education services is increasing. This is illustrated by the growing number of colleges which are increasingly and offering various types and levels of courses. But the increasing in the number is sometimes not accompanied by an increase in the quality of education and quality of human resources created. Tilaar (2000) states that higher education in Indonesia is still not significantly improving the quality of Indonesian human, good moral, work ethic, ability and skills that are still far from desirable. So the university’s performance is not maximized in performing its role.

Global life today requires the mastery and application of science and technology, but the efforts of higher education are still not fully meet these demands so we need a strategy that is appropriate for universities to be able to meet high-quality education and have high competitiveness.

A competitive advantage can be achieved by utilizing the assets of the organization, namely (1) tangible assets; assets that have physical form and (2) intangible assets; an asset that has no physical form. Technological development and globalization are characterized by the
technology shift, where the work went from relying on muscles and skills into knowledge-based jobs that rely more on brains and knowledge, so it becomes a very important intangible asset.

Asni (2007) in Subkhan and Citraningrum (2010) states that the company's ability to survive in the competition is very dependent on the capacity to manage intangible assets. One approach used in the measurement of intangible assets is intellectual capital (IC). Intellectual capital consists of three (3) elements: human capital, structural capital and relational capital. Human resource (human capital) is considered the most important company asset because human capital controls other assets owned by the company. Human capital is the executive management of the company's assets both tangible and intangible assets to generate profit and added value. Capital structure is an organization's ability to meet the needs of consumers. Standard structure capital is the knowledge that was around routine activities of the company, such as: intellectual property rights, technology, inventions, data, publications and processes that can be patented, copyrights or trade secrets (Habiburrahman, 2008). Relational capital is the result of the organization's ability to interact positively with the environment, including suppliers, customers, competitors, shareholders, and society. Management of the three elements of intellectual capital will help companies achieve a competitive advantage that can help improve organizational performance. Performance is seen as a company's ability to earn a profit while the intellectual capital is a means for the creation of profit and added value for the company.

At first the company's performance is measured by the book value in the financial statements. It is considered to reflect the value of the company. But in line with the time it doesn't yet show its true value because the company has a hidden value that does not appear in the financial statements. Edvinsson (1999), mentions the hidden value is to differentiate one another and gives a competitive advantage. Hidden value has contributed to the company performance, such as a brilliant idea, the competence of the employees / workers, systems, infrastructure companies, and research and development. This is referred to as intellectual capital (IC).

Medan city as the third largest city in Indonesia is also a city that is filled by the students. This means that in the city of Medan, there are a lot of universities, both universities with the status of public and private. However, of many universities in Medan, only three public universities in Medan: University of North Sumatra (USU), Public University of Medan (UNIMED), and the Public Islamic University of North Sumatra (IAIN). The Three country's universities have their own specifications and advantages.

Each community needs to maintain its quality and attention to intellectual capitalnya as an overview of the performance of a university. Intellectual capital is an intangible asset of an organization that can be used to create value for the organization through a combination of human capital, structural capital and relational capital. According to Burr and Girardi (2002) competence and commitment owned by lecturers will be able to create value for universities if they are supported by the provision of job control or adequate autonomy.

Disclosure IC in universities is useful to reveal the circumstances if the effort of different universities and are used as an instrument of control and supervision to identify structures, personal strengths and weaknesses (Altenburger and Schaffhauser - Linzatti 2006 in Meilianti and Frisko, 2013). Considering not many IC studies in universities in Indonesia and also the conceptual framework IC reporting colleges with an Indonesian perspective is also rare. For example, research Puspitahati et al, (2011) and Nadia (2011), which examines the reporting of IC on the university website in Indonesia using a framework built for universities in Europe, so in some items not found on the college website in Indonesia, even on UGM and ITB.
These conditions resulted in researcher examine how the shape and role of intellectual capital on the performance of the universities in the city of Medan to increase its value in the community.

2. THEORETICAL BASIS

2.1 Intellectual capital (IC)

Intellectual capital is an intangible asset or the intangible assets owned by the company. Intellectual capital (IC) is used in the management literature, referring to the values that intangible that include: employee relations, staff management, user/customer and other stakeholders.

Model IC commonly used has three main categories of intangible assets: human, structural and relational (Edvinsson, 1999; Sullivan, 2000; Bontis, 2001). As for some definitions for each element can be summarized as follows:

Human capital (HC) can be defined as an arrangement of values, attitudes, qualifications and skills of employees that will generate value for the organization (Roos et al., 1997).

Structural capital (SC) is the value created in the organization who will be remembered by the employees (Roos et al.; 1997; Boisot, 2002).

Relational Capital (RC) is the result of the value created by the organization in relation to the environment, including suppliers, buyers, competitors, shareholders, stakeholders and the public (Bontis, 2001). Relational capital is also a result of the organization's ability to interact positively with members of the community to improve welfare through increased HC and SC (Nazari and Herremans, 2007). Allee (1998) in Kok (2005) stated that the relational capital is influenced by relationships with customers and coworkers. While Sveiby (1997) in Cahyati and Setyawasih (2016) mentions that the relational capital is described as a connection with the communities.

2.2 Performance

Assessment of achievement or performance of a company (business performance) can be used as a basis for decision making by internal and external parties. According to Moeheriono (2010), the performance is the result of work that can be achieved by a person or group within an organization, quantitatively and qualitatively, in accordance with the authority and responsibilities of each in order to achieve organizational objectives and ethics.

Sastrohadiwiryo (2003), mentions that in general the performance is influenced by the skill, experience and ability of labor is concerned, and all are factors of non-financial assets. Sastrohadiwiryo (2003) also mentions that the performance appraisal is an activity by management to assess workforce performance by comparing performance with a description of the description in a given period. Performance measurement is a process to record and measure the implementation of activities in the direction of achieving the goals, objectives, vision and mission through the results are displayed, or the process of implementing an activity.

3. METODE PENELITIAN

The study population was all the lecturers who teach at public universities in Medan ie UIN (IAIN), USU and UNIMED. The research sample is numbering 300 people taken as many as 100 respondents from each university. Samples were taken by accidental sampling method. Collecting data in this study using questionnaires and will be processed through discriminant analysis method and analysis of Structural Equation Model.
4. CONCEPTUAL FRAMEWORK

Currently the universities became the object of great interest in the development of intellectual capital beyond conventional lines / profit oriented. The cause is the fact that the main purpose of universities is to produce and disseminate knowledge, and research and human resource development (Canibano and Sanchez, 2005).

Knowledge and innovation capacity effectively are important values for the control of company activities so that companies can use other assets efficiently and economically. And eventually companies can achieve competitive advantage (Ruppert in Sawarjuwono, Kadir, 2003). One of the approaches that can be used in the measurement of intangible assets are intellectual capital. Intellectual capital is affecting the performance of the company as in his research Divianto in 2010 which entitle Influence Factors Intellectual Capital (Human Capital Structural Capital and Customer Capital) Against Business Performance. The results of his research shows that the third factors are positive and have significant impact on business performance.

![INTELLECTUAL CAPITAL Diagram](image)

Figure 1: Conceptual Framework Research

From the conceptual framework can be seen that intellectual capital consists of human capital, structural capital and relational capital affect the performance of the universities in the city of Medan.

4.1 Operational definition

4.1.1 Independent Variables / exogenous

Intellectual capital is intangible assets of the company and used to obtain the success of the organization and has a high competitive power:

a. Human Capital

A set of values, behaviors, qualifications, and expertise possessed by members of the organization to generate value for the company. The indicators are: the availability of professors, training and education, faculty accomplishments, and the competence of lecturers.

b. Structural Capital

Structural Capital is the ability of the organization or company to meet all the organization's activities and structures that support members to produce optimal performance. The indicators are: academic and research facilities, the ratio of faculty per student, licenses / patents, systems and work programs, and the accuracy of the vision of the mission of the college.
c. **Relational Capital**

Relational Capital is the result of the organization's ability to interact positively with the environment including customers, competitors, shareholders, stakeholders and community. The indicators are: hits site / website universities, national seminars, international seminars, research / community service, scientific publications, relations with college graduates.

4.2.2 **Dependent Variables / endogenous**

Performance of higher education that results has been obtained. The indicators are: competitiveness, reputation, achievement of targets, research, higher education management governance.

4.2 **Data processing**

4.2.1 **Analysis Descriptive Statistics**

Questionnaires distributed in whole can be used with a response rate of 90%. Respondents generally described that lecturers that exist in each of the universities in the domination by lecturers with education level S2 (60%) and teachers with education level S3 (40%). The universities in the city of Medan was also dominated by lecturers who are young (junior) to the level of 28-38 years of age (40%), aged 39-49 years (35%) and age ≥ 50 years only (25%).

4.2.2 **SEM analysis**

Processing of data obtained through the questionnaire is then processed through the methods of data analysis Structural Equation Model (SEM) with the help of AMOS 18.0. Processing results obtained following the research model:

![Figure 2. SEM analysis.](image)

The results of the analysis output are in table 1.

<table>
<thead>
<tr>
<th>Estimate</th>
<th>P</th>
<th>Results</th>
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<tbody>
<tr>
<td>performance &lt;- HC 1.203 *** Significant</td>
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<tr>
<td>performance &lt;- SC -0.158 0.309 Not significant</td>
<td></td>
<td></td>
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<tr>
<td>performance &lt;- RC -0.103 0.265 Not significant</td>
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</tbody>
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*** : 0.000 (highly significant)

Source: Hasil Pengolahan Data (2016)
Based on the data in Table 1 it can be known that Intellectual Capital has an influence on the performance of public universities in the city of Medan. But of the three elements of intellectual capital, only human capital and significant positive effect on the performance of the universities in the city of Medan with a p-value (0.000), and these results show a very high level of significance to the value effect (1.203). Structural capital as a second element of intellectual capital does not have a significant influence and has a negative effect on the performance of universities in Medan with the p-value (0.309) and the great influence only (-0.158). Relational capital as the third element of intellectual capital gives the negative effects and no significant effect on the performance of universities in the city of Medan. Values of significance is p (0.265) with great influence only (-0.103).

5. DISCUSSION OF RESULTS DATA ANALYSIS

During this time the intellectual capital application of universities in Indonesia is still adopting of intellectual capital that is used by universities in Europe. Construction is intellectual capital items used are in accordance with the construction standards in Indonesia are carried out by combining the item IC (Leitner, 2002) and the National Accreditation Board of Higher Education (BAN-PT).

Intellectual capital provides output that refers to routine product research activities in universities such as publications, conference paper, training, and so forth. The result is a feat in activities such as new theories, new tools and analysis techniques. Intellectual capital reports that it has potential as a tool for linking performance measurement and budgeting. (Leitner, 2002). Preparation IC in universities is harder than the industry because universities have various goals and objectives that determine performance.

Human capital is the most important element for the establishment of an organization's intellectual capital, including a college. Schultz within Bontis (1999) describes that human capital as an important factor for improving the company's assets and increase productivity in order to maintain competitive advantage.

Changing business environment requires that companies continue to struggle for competitiveness through dynamic business strategies by combining creativity and innovation. Besides, human capital is important also because the human source plays role as a major source of innovation and creativity, but it is difficult to assess (Sawarjuwono and Kadir, 2003). The so called human resources are lecturers and education staff, librarians, laboratory, technicians and others (Ulum, 2012).

In accordance with the results of this study, it indicates that human capital affects positively and highly significant to the performance of the universities in the city of Medan. The better the human capital of a college, the better performance it provides. Human capital is considered as a potential competencies possessed by universities such as the number of lecturers and professors, training and education, faculty achievement, competence of lecturers becomes the factors that will play a role in improving the performance and achievement of all public universities.

At the time of the factors of human capital can be coordinated at maximum, the college performance and can be at the maximum also and ultimately it has high competitiveness. Training and education always given special attention to the lecturers and academic staff will increase the competence and expertise that will support better performance, and creates the better learning process.
Universities providing lecturers who have high achievement certainly demonstrated universities that are also excel being able to present qualified lecturers for the learners to support the smooth process of knowledge transferring and giving birth to a generation that is not only educated but also having noble character. Achievement also demonstrated high competence of a lecturer. Lecturers who have stout achievement not only in the academic field would indicate the maximum competence in their field. So, that will support the teaching and learning process, knowledge transfer to support the performance of the university as an institution that plays a role in the intellectual life of the nation. Definitely, universities must continue to make every effort to meet the needs and provide encouragement or to support facilities for a better human capital, especially in providing training and education that encourages creativity / innovation for professors and staff to excel and maximize competence then supporting productivity and ultimately to improve the university performance because the performance of a university is determined by the quality of human resources, which is as an important asset of organization.

The results of this study are supported by Cahyati and Setyawasih (2016), which stated that human capital is significantly related to performance factors of study program mainly on training and education as well as the creativity and innovation of the faculty and academic staff. Winarno et al, (2012) also supports this research that says that human capital has a significant effect on the performance of higher education mediated by the competence and innovation. The results of this study are supported by research conducted in Cambridge university by linking the human capital with organizational performance, the results show that human capital (intellectual capital, social capital, organizational capital and knowledge) has a significant influence on the performance of universities and intellectual capital is an important factor of human capital (Stiles and Kulvisaechana, 2004).

Human capital is also defined as a set of values, behaviors, qualifications, and expertise possessed by employees that can generate value for the company (Ross, et al., 1997). Bollen et al., (2005) in his study mentioned that the intellectual capital is divided into human capital, structural capital and relational capital which have a positive effect and is associated with intellectual property which indirectly affect the performance of the company. Structural capital as the second factor of university intellectual capital has negative effect and is not significant to the performance of the college. It means that there are ties between structural capitals which are not in line with the performance of universities. When the structural capital is in good performance, the university does not mean to have a good performance either, and it could even be declining. Then, the relationship is not strong so that it doesn’t play a role in determining college performance to be better.

Factors that build structural capital such as academic facilities and research provided for process of learning and teaching, the ratio of lecturers per student, licenses or patents, systems and work programs, the accuracy of the vision of the mission of higher education are some of the factors that are to be met as a standard of higher education set by National Accreditation Board of Higher Education so that universities can run well. But the fulfillment of all the factors or the media does not have a large impact or influence to improve the performance of a university if the human resources as the executor like lecturers, academic staff and students can not afford or do not have the competence to use it. In addition, if human resources involved have the competence to use the facilities and amenities well, the university is not innovative or up to date in meeting the infrastructure and facilities then it will certainly decrease the interest of lecturers, staff and students and it will disrupt the learning process and decrease the performance of universities to produce the next generation of quality in terms of morality and education. This situation will reduce the ability of the organization to support the competency of its members to produce optimal intellectual performance as well as overall business performance.
Work programs and systems that have been determined by public universities do not support performance because many are not fulfilled or implemented properly. The mission is not appropriate for a university or the vision of the strategy that led to the goal is not achieved entirely and cause the university performance decreases. Patent of a public university is not yet a factor that is very important and urgent to become university performance parameters. The ratio of lecturers and students will follow the standard of National Accreditation Board of Higher Education so that universities sometimes just chase to meet these standards regardless of the quality so it has no effect on performance. This results are consistent with research conducted by Cahyati and Setyawasih (2016) which states that structural capital does not significantly influence the performance of courses. Astuti and Sabeni (2004) in his study also mentioned that there is no significant relationship between structural capital with the company's performance in Central Java. But the results of this study contradict the research conducted by Bontis et al. (2000) which stated that there was a significant positive relationship between structural capital and business performance in the services sector in Malaysia and no significant effect on non-services sector. Subkhan, Citraningrum (2010) in his study does not support the results of this study revealed that the structural capital that significantly influence the company's financial performance.

Relational capital consisting of the sites / websites of universities, national seminars, international seminars, research / community service, scientific publications, relations with college graduates, has a negative relationship and no significant effect on the performance of public universities. Relational capital is the result of the organization's ability to interact positively with their environment or the surrounding community. Universities require relation with the consumers (students, alumni, end user), a coworker (membership and external cooperation projects), public (the relation with industry) and other education in order to improve the quality of education and competitiveness of graduates. In this study, the relationship does not have to do with college performance. Negative relationship shows the condition at the time of campus relationship with good environmental performance does not necessarily indicate a good university. Then, insignificant effect showed a strong relationship between structural capitals with college performance. This means that structural capital does not have adequate impact in determining the performance of the college.

The number of visitors in the university’s website is not a parameter of good university performance but it could be only used as information to add options or reference source for people on a certain university. Then, the seminar conducted by universities either national or international, research or service are often not conducted at maximum and they only become media to meet work targets without thinking of quality that will enhance the performance and value of higher education. Relations with external parties and with alumni or graduates do not become media for comments and information to better understand and meet the needs of students, alumni and graduate users or the public to give maximum satisfaction and impact on improving the performance of the universities. The results of this study are supported by research conducted by Cahyati and Setyawasih (2016) which states that relational capital does not significantly influence the performance of courses. But the results of this study are not supported by research conducted by Bollen et al., (2005) which states that human capital, structural capital and relational capital that became part of the intellectual capital has influence on the intellectual property that does not directly affect the company's performance. Research conducted by Ulum (2009) also does not support the results of this research that intellectual capital (human capital, structural capital and relational capital) discount a significant correlation with the performance of the company.

At the present time intellectual capital is not fully expressed as the assets in the conceptual framework of a university. So through this research finding of a positive relationship and very significant to the performance of higher education can provide proof that the intellectual
capital, especially human capital to be highly beneficial for the performance of high-value public universities in particular to high competitiveness in the future. Universities should continue to spur quality and competence through human resource that is part of human capital and showed the best qualities of its performance to the community as a source of knowledge or container to the intellectual life of the nation. Hartono (2001) suggested that intellectual capital can not be owned or controlled by the company because the knowledge belong to the property of employees. Besides, intellectual capital is rated as the only asset of economic sacrifices to obtain intellectual capital, whereas the intellectual capital not only reported on its cost, but it is more to the value that has been created. Then, intellectual capital does not fulfill the information which is relevant and reliable for their uncertainty about the existence and the relationship can be traced between the economic sacrifices and results. It is a challenge for universities to continue to update the system, programs and performance measurement, and then continues to innovate and improve their competence to get the best value for the performance of a university in public.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

1. Human capital has a positive effect and significant to the performance of the universities in the city of Medan. Training and education play an important role in improving achievement and competence of lecturers and academic staff so that they will help performance as human resources, the better universities overall.
2. Structural capital has a negative effect and is not significant on the performance of public universities in the city of Medan.
3. Relational capital has a negative effect and is not significant on the performance of public universities in the city of Medan.
4. Intellectual capital has a role to influence the value and performance of a public university in the city of Medan, especially human capital as the most significant factor in affecting performance and provide a positive value for public universities in the city of Medan. Intellectual capital of universities is related to the three foundations of university so measurement is more directed to faculty performance as part of the human capital.

6.2 Recommendation

Recommendations that can be given based on the results of this study are:
1. Universities should continue to support the lecturers and academic staff to improve the performance and competence as professional staff in carrying out their duties and responsibilities through the support means and opportunities for education and training.
2. Universities should empower the experienced lecturers for their own internal needs, especially for external needs but they still carry the name of the universities where lecturers shelter so that the performance of the universities will be better. Universities must provide rewards for the lecturers and all the academic staff in accordance with their achievement and contribution to the universities.
3. Universities need to focus their attention to the factors of structural capital so that those factors can play a role to affect the performance of the universities. By conducting supervision and control of the system and work programs to be implemented properly and correctly, it is expected that the vision of the college can be reached. Universities also need to evaluate the process and achievements that have been made. Besides, paying attention to and improving the academic and research facilities that support the learning process are required to make the teachers and students feel comfortable and satisfied. The universities also needs to consider carefully about patents or licenses, especially for research and community service that can be used as the performance parameters of a good higher education in public.
4. Universities should focus on factors that build relational capital of university to get a good impact on performance. Universities should begin to establish good cooperation with external parties or partners, create the right partnership strategy mainly related to seminars, training, research or scientific publications so that the relationship can be good which will accommodate the campus needs well to support the college performance. In addition, the universities must establish good relations with the community, students, or alumni to gather information about the needs and grievances of the universities or about the extent of their knowledge towards the universities so that all of them can be a tool or input for better performance in the future.

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