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Does intellectual capital matter in performance management system-organizational performance relationship? Experience of higher education institutions in Indonesia

Received 5 December 2018
Revised 7 January 2019
11 March 2019
26 May 2019
27 June 2019
Accepted 27 June 2019

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Abstract

Purpose – The purpose of this paper is to investigate whether performance management system (PMS) has a positive effect on organizational performance. Furthermore, it also investigates whether intellectual capital (IC) mediates PMS-organizational performance relationship.
Design/methodology/approach – This study is designed as a quantitative research employing a partial least squares structural equation modeling (PLS-SEM). Using an online survey, data are collected from the HEIs managers under the Ministry of Research, Technology and Higher Education, the Government of Indonesia (MRTH-GOI). This research uses a mediation model approach to test the indirect effect of IC.
Findings – The results reveal that PMS has a positive direct effect on organizational performance of the HEIs in Indonesia. Further analysis proves that IC partially mediates PMS-organizational relationship.
Research limitations/implications – This research is context-specific for Indonesia and caution should be used when generalizing it to other countries. It implies that the better the organizational performance of the HEIs, the better the quality of life in the society. PMS and IC play a crucial role in the era of knowledge economy.
Practical implications – The HEIs managers should design and implement a reliable PMS. They also should properly manage the IC (human capital, structural capital, relational capital) so that they can enhance organizational performance in areas of teaching, research and community service as the core business of the HEIs.
Social implications – As the global education competition has become a serious issue in each HEI in Indonesia, the results of this study contribute to providing an approach on how to achieve a better organizational performance which brings more benefits to the society. The HEIs display a strategic role in improving the quality of life of society. The knowledge economy requires society to enhance the quality of education at all levels. This research model and results provide empirical evidence of the importance of IC which mediates the relationship between PMS and organizational performance. When the HEIs in Indonesia implement this model of managing IC, the society will get more benefits in terms of the improvements in the quality of education, teaching, research and community service from the HEIs. The better the HEIs performance, the better the quality of life of the society in the era of knowledge economy.
Originality/value – This research brings together issues that are usually examined separately in previous studies. It employs a mediation research model to explore the central role of IC in PMS- organizational performance relationship which is rarely researched. This is also the first study exploring the three constructs of PMS, IC and organizational performance in the Indonesian HEIs research setting.

Keywords Intellectual capital, Higher education institutions, Organizational performance, Performance management system

Paper type Research paper

The authors thank five anonymous referees for the insightful comments and helpful suggestions. The authors are also pleased to acknowledge the financial support from Universitas Airlangga.

Journal of Intellectual Capital
Vol. 20 No. 4, 2019
pp. 533-554
© Emerald Publishing Limited
1469-1930
DOI 10.1108/JIC-12-2018-0209

1. Introduction

Performance is always crucial for both profit-oriented and nonprofit-oriented organizations because it is the actual achievement of the desired organizational goals and objectives (Beitsch *et al.*, 2015; Para-González *et al.*, 2018; Geys and Sørensen, 2018). Performance refers to the results of activities in the form of outputs and outcomes (Van Dooren *et al.*, 2015; Angiola *et al.*, 2018). Performance is also related to the achievements of organizational vision and mission (Bititci *et al.*, 2016; Duygulu *et al.*, 2016). Recently, there has been a growing tendency throughout the world that public organizations are facing great pressures to improve performance and to reform public management regarding the use of public resources (West and Blackman, 2015; Gerrish, 2015; Angiola *et al.*, 2018). Using the story of the financial crisis, Massey (2018) stated that public organizations must be reformed in terms of improved policy capacity and good governance. A strong state in a free economy must be capable of balancing between deregulation for economic growth and regulation for the public goods (Hvidman and Andersen, 2014; Bergquist and Keskitalo, 2016; Hazelkorn and Gibson, 2019).

One of the most important public institutions is the HEI. All over the world, the HEIs have experienced the dynamics of rapid changes. The ideology of the HEI as a legal entity has become increasingly important (De Boer *et al.*, 2007; Oertel, 2018). Initially, the HEIs are built to improve the quality of students by using resources available (Bagley and Portnoi, 2014; Pucciarelli and Kaplan, 2016; Rodionov *et al.*, 2016). Nowadays, the HEI is not only a public organization that is closely related to the government and community, but also an organization that can do business and collaborate with various parties around the world (Moon *et al.*, 2017; Tseng *et al.*, 2018). The globalized relationships that can be formed by the HEIs rely on the organizations' reputation and affect the competition that the HEIs face (Naidoo, 2016; Musselin, 2018).

The HEIs face intense competition not only among individuals and countries but also among institutions. This leads to multilevel competition and makes another university as a competitor (Musselin, 2018). Competition is triggered by the development of global rankings of HEIs (Bagley and Portnoi, 2014). Currently, the QS World University Rankings (QS WUR) and the World University Rankings (THE WUR) are used to access the quality and reputation of universities around the world (Salmi, 2013; Collins and Park, 2016; Altbach and Salmi, 2017). In addition to university rankings developed by private sectors, each government has also developed its own ranking schemes.

Basically, performance of the HEI is evaluated based on three areas, namely: teaching, research and community service or national development (Altbach, 2015; Bisogno *et al.*, 2018; Pinheiro *et al.*, 2015; Fitzgerald *et al.*, 2016). It relates to the tasks of the HEI as a public organization that serves the community. Thus, nonfinancial measures in addition to financial measures should be considered in measuring the HEI performance. To fulfill these obligations, the HEIs are required to improve their performance by adopting PMS used by the private sector. The obligations require a systematic, fair, intelligent, effective, appropriate and motivating PMS (Pavlov *et al.*, 2017). Beeri *et al.* (2018) stated that PMS is associated with higher levels of citizens' trust in and satisfaction with local government.

This study has a different perspective compared to the work of Asiaei *et al.* (2018) stating that IC is indirectly associated with organizational performance through the intervening variable of the balanced use of interactive and diagnostic PM systems. This study proposes a mediation model in which IC mediates the relationship between PMS and organizational performance. It based on the theoretical argument that the strategic PMS should access the human capital readiness, information capital readiness and organizational readiness (Kaplan and Norton, 2004) in order to develop intangible assets or IC initiatives. It is also based on some previous studies by Hassan *et al.* (2016), Severgnini *et al.* (2018) as well as Yuliansyah and Jermias (2018) involving the mediating variables related to IC elements,

such as job satisfaction and psychological empowerment, organizational ambidexterity, service strategic alignment and organizational learning in the relationship between PMS and performance.

This study has the following contributions in the IC field. First, it contributes to the development of IC theory by confirming the relationship among PMS, IC, and organizational performance. Second, it focuses on the mediating role of IC on PMS-organizational performance relationship which is rarely investigated. Third, it examines whether the findings of previous studies are generalizable to a very different setting, namely the HEIs managers in a developing country, specifically Indonesia. Finally, it provides practical implications to the HEIs managers regarding the importance of building strong IC in the strategy implementation, especially in the relationship between PMS and organizational performance.

The remainder of this paper is organized as follows: Section 2 examines the relevant literature and hypotheses development. Section 3 presents methodology and measurements. Section 4 presents empirical results. Finally, Section 5 describes the conclusion and implications of this study.

2. Literature review and hypotheses development

PMS has a crucial role in the success of strategy implementation and organizational performance. Although it is still controversial (Cândido and Santos, 2015), according to Mintzberg (1994, pp. 25, 284) and Kaplan (Kaplan and Norton, 2001, p. 1), the failure rate of strategy implementation ranges between 50 and 90 percent. The failure in strategy implementation causes a significant loss for an organization (Ivančić, 2013). This is why an effective PMS is needed to keep strategy implementation in the right place (Ilee and Puranam, 2016).

The resource as an organization's input becomes a vital aspect in performance management. However, IC is not merely an input, but also an output for the HEIs (Andreeva and Garanina, 2016). The HEIs use their lecturers, infrastructures, links and system to support the improvement of their students' intelligence. High-quality graduates and research produced will drive a good reputation and trust to the HEIs. Hence, the well-managed IC will generate competitive advantage and maintain the HEIs' sustainability (Pirozzi and Ferulano, 2016; Secundo *et al.*, 2016; Sangiorgi and Siboni, 2017). The weak IC certainly contributes to the high failure rate of strategy execution and organizational performance, because IC is a major driver for organizational productivity (Bornemann and Weidenhofer, 2014).

An effective PMS should support and facilitate the development of IC to explore the potential of intangible assets (Asiaei *et al.*, 2018). IC and its elements are the main important factors for value creation. IC consists of human capital, structural capital and relational capital. Human capital refers to the quality of human knowledge that must react to market needs (Gogan *et al.*, 2016; Marginson, 2017). Structural capital refers to the organizational infrastructure to produce outputs (Gogan *et al.*, 2016; Inkinen *et al.*, 2017; Ramadan *et al.*, 2017). Relational capital refers to the ability of an organization to establish sustainable relationships with stakeholders (Pirozzi and Ferulano, 2016; Secundo *et al.*, 2018). Therefore, design and nature of PMS must be innovative to increase the contribution of these intangible resources (Tayles *et al.*, 2007). Scholars have demonstrated that PMS triggers the development of human capital (Secundo and Elia, 2014) and encourages organizational learning (Deschamps and Mattijs, 2018).

Previous studies regarding the effect of PMS on organizational performance generates inconclusive results. Some studies by scholars (Gerrish, 2015; Pavlov *et al.*, 2017) showed that PMS improves performance. However, other scholars (Powell *et al.*, 2011; Hvidman and Andersen, 2014; Wijethilake *et al.*, 2018) showed that PMS does not always affect performance. This research gap needs further studies regarding the existence of mediation variables.

As previously mentioned, IC is proposed as the mediating variable that relates between PMS and organizational performance because it is theoretically supported by Kaplan and Norton (2004) and empirically supported by the previous studies of Hassan *et al.* (2016), Severgnini *et al.* (2018) as well as Yuliansyah and Jermias (2018) employing mediating variables that are part of IC elements, namely job satisfaction and psychological empowerment, organizational ambidexterity, service strategic alignment and organizational learning.

Although the relationship between IC and organizational performance is supported by most previous studies, some studies still show that not all components of IC have an effect on organizational performance. A study conducted by Lu (2012) in Taiwan revealed the consequences of IC on resource allocation and competitive advantage. Gogan *et al.* (2016) conducted a study and demonstrated that IC has a positive effect on organizational performance. Camfield *et al.* (2018) found that IC plays an important role in creating an organization's competitive advantage in Brazilian companies. However, studies by other scholars (Andreeva and Garanina, 2016) showed that human capital and structural capital have a significant relationship with organizational performance, while relational capital does not associate with performance. This research gap justifies for further studies and this issue is addressed in this study.

The main motivation of this study is to investigate whether PMS is associated with organizational performance and if so, whether the relationship is mediated by IC. The position of this study is to strengthen the IC theory by providing the empirical evidence of the crucial role of IC in the strategy implementation, especially in describing how PMS as a strategy implementation tool affects organizational performance via IC. Practically, this study is important for the HEIs managers because it provides a better understanding of how IC plays a strategic role in PMS-organizational performance relationship. For the HEIs managers in Indonesia, this study provides a better solution for competing in the era of global education competition by building the strong IC management. The fact that only three out of 4,687 HEIs are in the list of top 500 QS WUR (Fauzan, 2017) shows that the Indonesian HEIs are far behind the neighboring countries such as Malaysia and Singapore. Therefore, the Indonesian HEIs must concentrate to strengthen their IC if they want to improve their competitive position in the global HEIs competition.

Most previous studies have demonstrated the associations of PMS with organizational performance, PMS with IC, as well as IC with organizational performance. In this study, we develop a research model that enables to investigate the mediating role of IC. Very rarely empirical research has examined the mediating role of IC on PMS-organizational performance relationship, especially in the HEIs research setting. Dumay (2016) highlighted several opportunities for future IC research, including expansion into third stage IC research to understand how IC can be managed and operationalized within an organization. This study fits within the third stage of IC research, as it explores the management of IC, that is, IC in an organizational setting and the impacts of an internal PMS on academics. As stated by scholars (ter Bogt and Scapens, 2009, Martin-Sardesai and Guthrie, 2017), research providing empirical evidence on the impact of PMS on IC within public sector organizations is limited. Following (Bisogno *et al.*, 2018), IC research in education is important because universities openly compete on the national and international stage of rankings and prestige and Australasia contributes little to IC education research.

Academic capitalism is characterized by increasing marketing activities by the HEIs (Berman, 2011; Münch, 2014) and this issue has long been debated by scholars (Musselin, 2010). Furthermore, this competition is framed as a quality competition among higher education institutions (Pucciarelli and Kaplan, 2016; Naidoo, 2016; Campbell *et al.*, 2018). This is in line with the quality economy describing a situation in which competition is based on quality instead of price so that the main issue is on quality assessment rather than price determination (Beckert and Musselin, 2013). In order to qualify as the world-class institutions, the HEIs must

meet several predetermined criteria. Now, the quality of the HEIs is assessed based on indicators of outputs, processes and certain algorithms depending on each rating agency (Zhang and Luo, 2016; Rodionov *et al.*, 2016; Musselin, 2018). Because of this ranking scheme, the HEIs around the world, including in Indonesia, are competing for the best performance in line with their stakeholder requirements (Collins and Park, 2016; Campbell *et al.*, 2018). This ranking scheme reveals that the global competitive position of the Indonesian HEIs are still far below the performance of the HEIs in the developed countries. Therefore, the issue of good university governance is emerging. Good university governance raises issues of creating a better organizational value involving strategic management, performance management, IC management, risk management and business process management (Rotberg, 2014; Pinho *et al.*, 2014; Azeez, 2015). To deal with this global education competition, the HEI managers are required to improve their competencies. Therefore, since the last decade, managers of the HEIs have begun to adopt management methods from the private sector.

A solid PMS for diagnostic and interactive uses is required for an effective strategy execution (Arjaliès and Mundy, 2013; Su *et al.*, 2017). PMS must be designed according to strategy to improve performance, (Vieira *et al.*, 2016), because PMS aligns organizational activities with its strategy (Tucker and Parker, 2015) and communicates strategy to organizational members so that organizational goals can be better understood (Arjaliès and Mundy, 2013). The strategy and PMS drive the need for suitable IC for successful execution.

2.1 Performance management system and organizational performance

Performance management refers to the process of measuring and managing the performance of individuals and teams, monitoring, assessing and providing a fair remuneration to members (Sattar *et al.*, 2018). Increasingly stringent regulations (Egginton, 2010; Thunnissen, 2015) require management to be more transparent and accountable. The new PMS enables public sector institutions, including higher education institutions to be more transparent in using public funds, explaining the achievements of research, training, innovation and benefits to stakeholders, developing intangible assets, revealing external influences, communicating new organizational values and showing their competitiveness (Secundo *et al.*, 2015). Ilias *et al.* (2016) proved that PMS is associated with performance. Management uses a PMS to achieve goals and to ensure that organizational activities are in line with the direction of the strategy. To build a responsive public institution, including in education, performance management reforms are the popular way (Snyder *et al.*, 2017).

Globalization has triggered major changes in the HEIs. Nowadays, the HEIs are more diverse, not only the type of higher education, but also the types of students and study programs. Higher education also involves more students, lecturers and administrative staff so it demands managers to harmonize quality and curriculum (Saudi, 2014). This pressure demands that HEIs be more competitive, efficient, effective and responsive to stakeholders' needs, which in turn triggers interest in assessing the performance of HEIs that have never existed before. As a result, PMS has become a necessity in many institutions. Managers begin to think about how traditional governance with a bureaucratic-collegial model can turn into a professional management model (Vilalta and Drissi, 2001; Shattock, 2017). A study by Ilias *et al.* (2016) on 899 department heads in Malaysia revealed that the formal external and internal control system affect the three dimensions of performance, namely financial, service quality and procedural performance. The HEIs in Indonesia are also demanded by their stakeholders to have world-class performance. The GOI has adopted the world-class performance standards as well as their own standardization schemes. Thus, it can be concluded that the better the design and the implementation of PMS, the higher the performance that will be achieved by an organization. Therefore, the following first hypothesis is proposed:

H1. PMS is associated with organizational performance.

2.2 Performance management system and intellectual capital

The role of IC in higher education is extremely important because higher education focuses on the development of intangible assets. Higher education itself is a vehicle of knowledge because every activity is intended for the development and dissemination of knowledge (Cricelli *et al.*, 2018). Almost all scholars who discuss IC refer to the potential value. Indeed, IC represents all non-monetary and non-physical resources of an organization (Moghadampour *et al.*, 2016). It should also be emphasized that IC is the basis of competitive advantage. Furthermore, IC can be treated as a stock that offers attractive prospects about the organizational potentials (Sardo *et al.*, 2018; Nadeem *et al.*, 2018).

It is undeniable that IC and its elements are the sources of value creation in the era of knowledge economy. Some studies proved that PMS influences the development of IC components, such as human capital (Rompho and Siengthai, 2012), structural capital (Cleary, 2015; Novas *et al.*, 2017) and relational capital (Novas *et al.*, 2017). Secundo and Elia (2014) conducted a case study and revealed that PMS triggers the development of human capital and activate entrepreneurial performance. Asiaei *et al.* (2018) proved that an effective PMS supports and facilitates the development of IC to realize potential intangibles. A longitudinal case study by Deschamps and Mattijs (2018) in a Belgian organization also showed that performance management encourages organizational learning and performance information provides a strong foundation for learning forums and discussions of best practices. Hence, it can be concluded that the better the design and the implementation of PMS, the better the IC in an organization. Therefore, the following second hypothesis is proposed:

H2. PMS is associated with IC.

2.3 Intellectual capital and organizational performance

IC plays an extremely important role in the era of knowledge economy because it is the source of competitive advantage. The importance of IC has attracted scholars to conduct studies to prove that IC affects organizational performance (Lu, 2012; Gogan *et al.*, 2016). Bontis *et al.* (2000) investigated the effect of IC on business performance in companies in Malaysia and proved that IC has a positive effect on the companies' business performance. Wang *et al.* (2014) examined the effect of knowledge sharing on the performance of 228 high-tech companies in China and the mediating role of IC and provided evidence that all three IC (human capital, structural capital and relational capital) have a positive effect on the company's operational and financial performance. A study by Hussinki *et al.* (2017) on 259 companies in Finland revealed that the performance of companies having a higher level of IC is better than that with a lower level of IC. Camfield *et al.* (2018) conducted a study in Brazilian companies and proved that IC plays an important role in creating an organization's competitive advantage. Thus, it can be concluded from the previous discussion that the better the IC development, the better the organizational performance. Therefore, the following third hypothesis is proposed:

H3. IC is associated with organizational performance.

2.4 Mediating role of IC on PMS-organizational performance relationship

From a theoretical point of view, a good strategy needs an effective strategy execution. An innovative PMS should translate and describe the strategy to show strategic initiatives needed by management, including IC development initiatives, to achieve the desired performance targets. For example, the Balanced Scorecard (BSC) as a strategic PMS describes and translates the organizational strategy to access the human capital readiness, information capital readiness and organizational readiness (Kaplan and Norton, 2004). The level of readiness will determine the intangible assets or IC development. Therefore, an

effective PMS drives and facilitates IC development so that the requirements of intangible assets is properly planned, disclosed and used to fully realize the potential of intangibles (Mouritsen, 2009).

Scholars have proved the effects of PMS on organizational performance, PMS on IC and IC on organizational performance. Those direct associations have been confirmed by some scholars (Lu, 2012; Wang *et al.*, 2014; Secundo and Elia, 2014; Ilias *et al.*, 2016; Gogan *et al.*, 2016; Hussinki *et al.*, 2017; Deschamps and Mattijs, 2018; Camfield *et al.*, 2018). Hence, it is reasonable to argue in this study that IC mediates the relationship between PMS and organizational performance.

The following studies by scholars empirically proved that some elements of IC mediate the relationship between PMS and performance at individual and organizational levels. Hassan *et al.* (2016) conducted a study using data of 100 sales branch managers and dealer managers of automotive companies in Malaysia and the findings showed that in automotive industry, job satisfaction and psychological empowerment mediate the relationship between strategic performance measurement system and managerial performance. A study by Severgnini *et al.* (2018) at 227 Brazilian software firms revealed that organizational ambidexterity mediates the relationship between three dimensions of PMS (attention focus, legitimization and strategic decision-making) and organizational performance. Another study by Yuliansyah and Jermias (2018) at 158 companies in the Indonesian financial sector showed that service strategic alignment and organizational learning mediate the relationship between SPMS and performance for product differentiation companies. The variables used in those studies (job satisfaction, psychological empowerment, organizational ambidexterity, strategic alignment and organizational learning) are closely related to the elements of IC (human capital, structural capital and relational capital). Thus, the previous studies empirically support that IC mediates the relationship between PMS and organizational performance. Therefore, the following fourth hypothesis is proposed:

H4. IC mediates the relationship between PMS and organizational performance.

2.5 Research model

We employ a mediation research model for this study as depicted in Figure 1. This model enables us to simultaneously test and analyze the relationship among three constructs of the study, namely performance management system, IC and organizational performance.

The conceptual research model explains that PMS is associated with organizational performance. Furthermore, the model also explains that IC mediates the relationship between PMS and organizational performance.

3. Methodology and measurement

3.1 Research design

According to the Higher Education Database of the Ministry of Research, Technology and Higher Education, Indonesia has 4,687 HEIs consisting of 586 universities, 221 institutes,

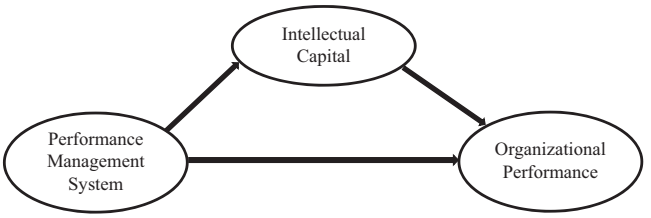

Figure 1. Conceptual research model

2,538 higher schools/colleges, 1,063 academies and 279 polytechnics (PDDIKTI, 2019) Recently, the Ministry has been working to enhance the quality of those HEIs. They have developed assessment schemes to enhance performance. The schemes have triggered the HEIs leaders to develop strategies, design and implement PMS to achieve their performance targets (Hazelkorn *et al.*, 2014; Naidoo, 2016; Pucciarelli and Kaplan, 2016; Musselin, 2018). Our study is designed as a quantitative research and its very relevant because it aims to investigate and test whether PMS affects organizational performance, if so, whether the PMS-organizational performance relationship is mediated by IC.

3.2 Data collection

The on-line questionnaires were used to obtain the data because it is more efficient, faster and cheaper. We derived our sample from the HEIs managers who become the members of an internal social media group administered by the Directorate General of Institution of the MRTHE. The managers in the group consisting of HEIs officers, specifically deans and directors. Because the population of managers is unknown, we employed the purposive sampling method, specifically the quota sampling. According to Sekaran and Bougie (2016, p. 248), quota sampling can be used on considerations of cost, time and the need to adequately represent minority elements in the population. Because the Indonesian universities and institutes are expected to be able to compete globally, the sample quota of 1,000 questionnaires is distributed to all universities and institutes, while the rest is distributed to higher schools/colleges, polytechnics and academies as shown in Table I. A brief description of the study and the confidentiality assurance were also sent along with the questionnaire. Respondents were asked to return a completed questionnaire within a week. The new questionnaire and a reminder letter were sent every month to those who have not returned the questionnaires. After three months, as many as 182 managers of the HEIs participated in this survey. The demographic analysis of respondents revealed in Table II.

3.3 Construct definitions and measurements

3.3.1 Performance Management System. In this study, we argue that the PMS is defined as the existence of a management system that enables the managers to execute strategy and to control strategic performance more effectively (Hvidman and Andersen, 2014; Bititci *et al.*, 2016; Angiola *et al.*, 2018). Therefore, we develop the construct of PMS consisting of: a systematic and reliable control system; strategic measures; a special unit; a monitoring system; a reliable strategic communication system; a fair reward system; applications or software; a routine discussion system; a specific performance management approach; strategic skills. In conclusion, we propose that the construct of an effective PMS is measured by those ten items. To measure this construct, a five-point Likert scale is used, rating from strongly disagree (1) to strongly agree (5).

3.3.2 Intellectual capital. IC in this study is defined as the combination of intangible resources and activities that allows an organization to transform a bundle of material, financial and human resources in a system capable of creating stakeholder value

Institutions	Questionnaires	Percentage
University	586	58.6
Institute	221	22.1
Academy	70	7
Polytechnic	48	4.8
Higher School/College	75	7.5
Total	1,000	100

Table I.
Quota sampling

Description	Respondents Total	Percentage
Gender		
Male	138	75.8
Female	44	24.2
Total	182	100
Education		
Master	93	51.1
Doctoral	89	48.9
Total	182	100
Experiences (in years)		
1–5	89	48.9
6–10	35	19.2
> 10	58	31.9
Total	182	100
Institutional form		
University	85	46.7
Institute	47	25.8
Academy	15	8.
Polytechnic	25	13.7
Higher School	10	5.5
Total	182	100

Table II. Characteristics of respondents

(Khalique *et al.*, 2015; Dumay, 2016; Dženopoljac *et al.*, 2016). To measure the construct of IC we adopted the items developed by Córcoles *et al.* (2013) with minor modifications. It consists of 41 items measuring human capital (11 items), structural capital (14 items) and relational capital (16 items). To measure human capital of the HEIs, we employ the following 11 items consisting of: academic and professional qualifications of teaching and research staff; scientific productivity; quality of lecturers and researchers; graduates quality; professional qualifications of administration and service staff; teaching capacities and competencies; research capacities and competences; efficiency of human capital; capacity for teamwork; leadership capacity; and training activities.

To measure structural capital of the HEIs, we employ the following 14 items consisting: facilities and material resources supporting pedagogical qualification and innovation; facilities and material resources supporting research and development; the institution's assessment and qualification processes; organizational structure; teaching management and organization; research management and organization; organization of scientific, cultural and social events; productivity of the administration, academic and support services; organization culture and values; effort in innovation and improvement; management quality; information system; technological capacity; intellectual property.

To measure relational capital of the HEIs, we employ the following 16 items consisting of: effectiveness of graduate teaching; student satisfaction; graduate employability; relations with students; relations with the business world; relations with society in general; application and dissemination of research; results with the media; university image; collaborations and contacts with public and private organizations; collaboration with other universities; strategic links; relations with quality institutions; the regional, national and international reputation of the university; social and cultural commitment; environmental responsibility. A five-point Likert scale is used, rating from strongly disagree (1) to strongly agree (5).

3.3.3 Organizational performance. In this study, the organizational performance is defined as the perceived outputs resulted by the HEIs during a period of last three years

consisting of: teaching outputs; research outputs; an enhancement of community; financial results from the government, students, companies and other donors; human capital improvement; information system improvements; cooperation with other institutions; facilities and infrastructure. In conclusion, we propose that the construct of organizational performance is measured by those eight items (Duygulu *et al.*, 2016; Angiola *et al.*, 2018). A five-point Likert scale is also used, rating from strongly disagree (1) to strongly agree (5).

3.3.4 The use of SEM PLS. Following Chin (1998a, b) and Nitzl (2016), we employed the partial least squares structural equation model (PLS-SEM) to test the hypotheses. The PLS-SEM is considered suitable for this study because in a single model it is capable of using multiple predictors and criterion variables; using latent variables and measured variables; handling multiple dependent and independent variables simultaneously; testing mediation relationship; dealing with a normal distributional assumption; and handling relatively small sample sizes and multicollinearity problems among independent variables.

4. Empirical results

4.1 Results of descriptive statistics

The results of descriptive statistics suggest the following. First, the construct of PMS (mean = 4.321; SD = 0.609) indicated that respondents strongly agree on the measurement items regarding the construct. Second, the construct of IC (mean = 4.570; SD = 0.474) suggested that respondents also strongly agree on the measurement items of the construct. Finally, respondents agree on the importance of increased organizational performance. The construct of organizational performance (mean = 4.136; SD = 0.603) showed that respondents agree on the measurement items of the construct. The following is the criteria of the average respondents' answers: $1.00 < \alpha < 1.79$: Strongly Disagree; $1.80 < \alpha < 2.59$: Disagree; $2.60 < \alpha < 3.39$: Neutral; $3.40 < \alpha < 4.19$: Agree; and $4.20 < \alpha < 5.00$: Strongly Agree.

4.2 Measurement model analysis

We employed the partial least squares (PLS) method to test the hypotheses of this study because it requires less stringent assumptions about the distributional characteristics of the raw data and sample size. Following Kock (2016), we used WARP-PLS software version 5.0 for the reason that it enables to take nonlinearity into consideration when estimating coefficients of association among linked variables.

Before assessing the structural model, we assessed the reliability and validity of measures relating to our specific constructs using the measurement model analysis. In this step, we addressed the issues of individual item reliability, construct reliability, convergent and discriminant validity for our reflective constructs. Although the ideal cut-off point is 0.70, individual item reliability is considered adequate when it has a factor loading at least 0.60. This indicates that the measure is accounting for at least 60 percent of the variance of the underlying latent variable (Chin, 1998a, b).

Table III shows that all measures were significant and above the 0.60 loading level. The composite reliability (CR) coefficients for the constructs are of more than the accepted level of 0.70, suggesting that the measures are reliable (Nunnaly, 1967; Hair *et al.*, 2013, p. 104). We assessed the construct validity by convergent validity and discriminant validity. Following Fornell and Larcker (1981), we employed the average variance extracted (AVE) to assess convergent validity which represents the average variance shared between a construct and its indicators. The AVE should be greater than 0.50 to ensure that measurement error does not dominate the variance captured by the construct (Vandenbosch, 1996). The discriminant validity was evaluated by comparing the square roots of AVEs with the correlation between constructs to describe whether a construct shares more variance with its measures than with other constructs. When the square root of AVE of a construct is greater than the correlation

Latent variable	Loading	*p*-values
Performance Management System (composite reliability = 0.930$^{(r)}$; AVE = 0.597$^{(cv)}$)		
PMS 1	0.776	< 0.001
PMS 2	0.747	< 0.001
PMS 3	0.792	< 0.001
PMS 4	0.830	< 0.001
PMS 5	0.793	< 0.001
PMS 6	0.762	< 0.001
PMS 7	0.840	< 0.001
PMS 8	0.689	< 0.001
PMS 9	0.707	< 0.001
Intellectual Capital (composite reliability = 0.982$^{(r)}$; AVE = 0.568$^{cv)}$)		
IC 1	0.650	< 0.001
IC 2	0.680	< 0.001
IC 3	0.722	< 0.001
IC 4	0.713	< 0.001
IC 5	0.781	< 0.001
IC 6	0.759	< 0.001
IC 7	0.791	< 0.001
IC 8	0.654	< 0.001
IC 9	0.743	< 0.001
IC 10	0.724	< 0.001
IC 11	0.748	< 0.001
IC 12	0.749	< 0.001
IC 13	0.774	< 0.001
IC 14	0.780	< 0.001
IC 15	0.670	< 0.001
IC 16	0.742	< 0.001
IC 17	0.803	< 0.001
IC 18	0.683	< 0.001
IC 19	0.807	< 0.001
IC 20	0.773	< 0.001
IC 21	0.753	< 0.001
IC 22	0.840	< 0.001
IC 23	0.798	< 0.001
IC 24	0.725	< 0.001
IC 25	0.774	< 0.001
IC 26	0.731	< 0.001
IC 27	0.791	< 0.001
IC 28	0.748	< 0.001
IC 29	0.712	< 0.001
IC 30	0.758	< 0.001
IC 31	0.773	< 0.001
IC 32	0.797	< 0.001
IC 33	0.702	< 0.001
IC 34	0.746	< 0.001
IC 35	0.817	< 0.001
IC 36	0.687	< 0.001
IC 37	0.799	< 0.001
IC 38	0.808	< 0.001
IC 39	0.795	< 0.001
IC 40	0.740	< 0.001
IC 41	0.797	< 0.001

(*continued*)

Table III.
Results of reliability and convergent validity

Latent variable	Loading	*p*-values
Organizational Performance (composite reliability = 0.934[(r)]; AVE = 0.641[(cv)])		
OP 1	0.814	< 0.001
OP 2	0.846	< 0.001
OP 3	0.798	< 0.001
OP 4	0.797	< 0.001
OP 5	0.856	< 0.001
OP 6	0.796	< 0.001
OP 7	0.796	< 0.001
OP 8	0.765	< 0.001

Table III.

Notes: [(r)]CR of 0.70 or more: sufficient reliability; [(cv)]AVE of 0.50 or more: convergent validity

between the construct with another construct, then it is valid (Fornell and Larcker, 1981). As shown in Table IV, correlation among constructs in the off-diagonal and the square root of AVE in the diagonal indicate adequate discriminant validity. Thus, it proves that the measurement model is reliable and valid.

Table IV describes positive and significant correlations between PMS and IC ($R^2 = 0.65$; $p < 0.001$) and organizational performance ($R^2 = 0.54$; $p < 0.001$). This suggests that PMS is an important variable in improving IC and organizational performance. In addition, IC is also positively correlated with organizational performance ($R^2 = 0.55$; $p < 0.001$) indicating that IC may enhance organizational performance. The AVEs for all constructs were above 0.50. Following Hulland (1999), this study provides evidence of convergent validity.

4.3 Structural model analysis

We used the structural model to test the hypothesized relationships, particularly to investigate whether the effect of PMS on organizational performance is direct or mediated by IC. We used a step-wise approach in performing structural model analysis (Baron and Kenny, 1986; Luft and Shields, 2003; Hartmann and Slapnicar, 2009). First, we ran PLS to test whether PMS directly affects organizational performance as stated in *H1*. Second, we introduced IC as the mediating variable to test the other hypotheses.

As seen in Table V (Panel A), the results show that PMS is positively associated with organizational performance (β coefficient: 0.54; $p < 0.01$; $R^2 = 0.29$) proving that *H1* stating that PMS is positively associated with organizational performance is supported. Further analysis is conducted by introducing IC as the mediating variable. The result reveals that PMS is positively associated with IC (β coefficient: 0.65; $p < 0.01$; $R^2 = 0.29$) and IC is also positively associated with organizational performance. However, as seen in Table V Panel B, the association between PMS and organizational performance after the insertion of IC remains significant (β coefficient: 0.32; $p < 0.01$). Therefore, IC partially mediates the relationship between PMS and organizational performance meaning that PMS still has a direct effect on organizational performance while there is an indirect effect of PMS on

	Performance management system	Intellectual capital	Organizational performance
Performance Management System	*0.77*[(dv)]		
Intellectual Capital	0.65***	*0.75*[(dv)]	
Organizational Performance	0.54***	0.56***	*0.80*[(dv)]

Table IV.
Discriminant validity

Notes: [(dv)]discriminant validity: diagonal elements > respective off-diagonal elements. ***Significant at $p < 0.01$

Panel A	β coefficient	R^2	Decision
Before including IC as the mediating variable			
Direct effect			
PMS > OP	0.54	0.29	Significant, *H1* is supported
Panel B	β coefficient	R^2	Description
After including IC as the mediating variable			
Direct effect			
PMS > OP	0.32***	0.54	Significant, *H1* is supported
PMS > IC	0.65***	0.65	Significant, *H2* is supported
IC > OP	0.35***	0.55	Significant, *H3* is supported
Panel C	β Coefficient	R^2	Decision
Indirect effects			
PMS > IC > OP	$0.65 \times 0.35 = 0.23$	0.37	*H4* is supported, partial mediation

Note: ***Significant at $p < 0.01$

Table V. Summary of the structural model analysis

organizational performance via IC. To examine whether the mediating effect of IC on the relationship between PMS and organizational performance is significant, we used the VAF value as seen in Table VI.

We used the effect size test to assess the practical significance of this study (Huck, 2008) and the estimate to which the phenomenon being studied (correlation or difference in means) exists in the population (Hair *et al.*, 2006). The effect size of this study based on the R^2 of 0.37 is 0.125. Following Cohen (1988), this figure shows a fairly medium effect suggesting a practical significance. Therefore, to improve organizational performance, it is important for the HEIs to manage PMS and IC.

Discussions. Our study investigates whether PMS affects organizational performance and if so, whether the effect is mediated by IC. Using a sample of 182 managers of the HEIs in Indonesia, we demonstrate that PMS is positively associated with organizational performance. By introducing IC as the mediating variable, further analysis reveals that IC partially mediates the relationship between PMS and organizational performance.

The first hypothesis stating that PMS is positively associated with organizational performance is supported. This result provides additional empirical evidence to many previous studies (Ilias *et al.*, 2016; Beeri *et al.*, 2018). This result also demonstrates that the effect of PMS on performance does not only occur in the developed countries but also in the developing countries, specifically in Indonesia. Furthermore, this means that the effect of PMS on performance does not only occur in profit-oriented companies but also in public organizations, such as the HEIs. The practical implication for the HEIs managers is that they need to develop a more reliable PMS because they are now assessed by rating agencies using quantitative indicators, standardized processes and algorithms. A good PMS will help managers of the HEIS to enhance performance.

Hypotheses	VAF	*p*-values	Category	Decision
Performance management system > Intellectual capital > Organizational performance	29.64%	< 0.001***	Partial mediation	Supported

Notes: VAF value: indirect effect/total effect = $(0.65 \times 0.35)/((0.65 \times 0.35) + 0.54) = 0.2964$; Total effect = indirect effect + direct effect before inserting mediating variable; 3)VAF value is between 20–80 percent; (VAF > 80 percent: a full mediation; VAF 20–80 percent: a partial mediation; VAF < 20 percent: no mediation). ***$p < 0.01$

Table VI. Result of hypotheses testing (indirect effects)

The second hypothesis stating that PMS is positively associated with IC is also supported. This result provides additional empirical evidence that the HEIs need a systematic, fair, intelligent, effective, appropriate and motivating PMS (Solanki, 2017) that enables managers to properly develop the best IC for the institutions. This provides additional support to previous studies (Secundo and Elia, 2014; Deschamps and Mattijs, 2018; Camfield *et al.*, 2018). A good PMS is needed by managers in both developing countries and developed countries, and it is also needed by managers in both private companies and public organizations.

The third hypothesis stating that IC is positively associated with organizational performance is supported. This result also empirically confirms that in the era of knowledge economy, the role of IC is extremely important not only in developed countries but also in a developing country, such as Indonesia. The QS WUR continues to evaluate universities around the world using the following six metrics: academic reputation (40 percent); employer reputation (10 percent); faculty/student ratio (20 percent); citations per faculty (20 percent); international faculty ratio (5 percent); and international student ratio (5 percent). The achievements of those metrics are mainly depended on the IC owned by the university. Thus, if the managers of the university want to enhance organizational performance, then they need to develop strong IC.

5. Conclusion, contribution and limitation

5.1 Conclusion

All hypotheses of this study are supported. It is empirically confirmed that PMS is associated with organizational performance. PMS is associated with IC. IC is associated with organizational performance. The most important conclusion of this study is that IC mediates PMS-organizational relationship. This study implies that without strong IC, strategy implementation using PMS will not generate an optimal organizational performance or even worse it will fail.

Higher education plays a critical role in every society. Therefore, it is always crucial to address the issue of the HEIs performance in the era of globalization and knowledge economy. It is undeniable that IC is the basis for creating organizational performance and competitive advantage. Still, it is important to know about how the mechanism and the role of IC in connecting PMS to organizational performance. Using a sample of 182 HEIs managers in Indonesia, we demonstrate that PMS has a positive effect on organizational performance. Further analysis reveals that IC partially mediates the relationship between PMS and organizational performance.

This study continues the works of Dumay (2016) suggesting that there are several opportunities for future IC research, including expansion into third stage IC research to understand how IC can be managed within an organization. Therefore, this study explores the role of IC in the HEIs in relation to the impact of an internal PMS on organizational performance. As stated by Martin-Sardesai and Guthrie (2017), research providing empirical evidence on the impact of PMS on IC within public sector organizations is very limited. This study also follows the suggestion of (Bisogno *et al.*, 2018) stating that IC research in education is important because universities openly compete on the national and international stage of rankings and prestige and Australasia contribute little to IC research in education. The IC research in education in Asian countries, especially in Indonesia is not mentioned at all. Therefore, this study is one of the few studies that investigate the mediating role of IC on PMS-organizational relationship in the HEIs research setting in a developing country, specifically in Indonesia.

The lack of professional IC in the Indonesian HEIs answers the question of why out of 586 universities and 221 institutes only three Indonesian HEIs include in the top 500 world-class universities according to the 2018 QS World University Ranking. There is still no obligation for the HEIs in Indonesia to report their IC, and rarely or even no

institution voluntarily reports on the IC management in a comprehensive format showing human capital, structural capital and relational capital management. It has become widespread news that the public starts questioning the use of 20 percent of the state budget for the education each year.

This study provides a more comprehensive understanding by offering a mediation research model stating the critical role of IC on performance management system-organizational relationship. This study also provides important empirical evidence that having good PMS only is not enough without the development of IC. Therefore, managers of the HEIs in Indonesia should build a strong IC because it is the critical source of enhancing the organizational performance in the era of global education competition and knowledge-based economy. Thus, the managers of the HEIs in Indonesia should understand that organizational performance will be better with reliable PMS and strong IC.

5.2 Contribution to theory

From the theoretical point of view, all hypotheses of this study are supported. This means that this study provides empirical evidence in supporting the development of theories in performance management and IC management, especially in the context of higher education in Indonesia as a developing country. PMS has a positive effect on organizational performance. PMS has a positive effect on IC development. IC has a positive effect on organizational performance. Further analysis of this study also demonstrates that IC mediates PMS-organizational performance relationship. Those results confirm that organizational performance is affected by a reliable PMS and strong IC mediates PMS-organizational relationship. The result contributes to strengthen the development of IC theory. This study provides additional support to previous studies of several scholars, such as Lu (2012), Wang *et al.* (2014), Secundo and Elia (2014), Ilias *et al.* (2016), Gogan *et al.* (2016), Novas *et al.* (2017), Hussinki *et al.* (2017), Deschamps and Mattijs (2018) and Camfield *et al.* (2018).

5.3 Contribution to practice

From the practical point of view, the mediation research model provides a more comprehensive understanding for managers of the HEIs in Indonesia regarding the mechanism of how PMS affects organizational performance via IC. The HEIs are now assessed using quantitative indicators, standardized processes and algorithms. Therefore, they need to have a more reliable PMS and excellent IC to achieve the desired performance. The results of this study also suggest that HEIs managers should verify the current status of IC governance in their organizations in terms of IC awareness, measurement, disclosure, management and reporting. Managers need to seek the best approach to enhance the readiness of IC within the organization to meet the performance targets demanded by PMS. Then, the strong IC will increase performance and lead the HEIs to become the world-class universities.

5.4 Contribution to society

As the global education competition has become a serious issue in each HEI in Indonesia, the results of this study contribute to providing an approach on how to achieve a better organizational performance which brings more benefits to the society. The HEIs display a strategic role in improving the quality of life of society. The knowledge economy requires society to enhance the quality of education at all levels. This research model and results provide empirical evidence of the importance of IC which mediates the relationship between PMS and organizational performance. When the HEIs in Indonesia implement this model of managing IC, the society will get more benefits in terms of the improvements in the quality of education, teaching, research and community service from the HEIs. The better the HEIs performance, the better the quality of life of the society in the era of knowledge economy.

5.5 Limitations and future research

There are several limitations of this study. First, the sample size used is relatively small and it may raise the issue of generalization. Future research should use a larger sample size to address this issue. Second, this study focuses on Indonesia and caution should be used when generalizing it to other countries. Future research should address this issue by conducting research in other developing countries to test the validity of the same model. Thirdly, this study is vulnerable to the typical weaknesses of survey research, regarding the validity and reliability of items and tests. Future research should try other approaches, such as archival data research or experimental research. In spite of these limitations, we still believe that the model and the results of this study is still beneficial for the theoretical development and management practices.

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