



THE INFLUENCE OF IT GOVERNANCE AND IT CAPABILITY ON THE PERFORMANCE OF PRIVATE HIGHER EDUCATION INSTITUTIONS: THE MEDIATION ROLE OF PERFORMANCE MANAGEMENT SYSTEMS

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Abstract

This study examines the effect of information technology (IT) governance and IT capability on the organizational performance of private Higher Education Institutions (HEI) with a performance management system as a mediating variable. This quantitative study uses primary data from questionnaires distributed to respondents online. Respondents in this study were 270 management and IT management of private universities on the island of Sumatra. This study used a sample of 90 private HEIs. Furthermore, the data was processed using Partial Least Square (PLS) technique. The results are that the performance management system partially mediates IT governance with organizational performance, while IT capability mediates fully with organizational performance. IT capabilities can encourage organizational performance through a good performance management system. Theoretically, it contributes to implementing technological resources mobilized in the performance management system to improve college performance. College management should consider developing technology and performance measurement systems to achieve sustainable competitive advantage.

Keywords: *IT governance; IT capability; Organizational performance; Performance management system.*

Abstrak

Penelitian ini bertujuan untuk menguji pengaruh tata kelola teknologi informasi (TI) dan kapabilitas TI terhadap kinerja organisasi Perguruan Tinggi (PT) swasta dengan sistem manajemen kinerja sebagai variabel mediasi. Penelitian ini merupakan penelitian kuantitatif dengan menggunakan data primer berdasarkan kuesioner yang disebarakan kepada responden melalui internet. Responden dalam penelitian ini adalah 270 manajemen dan manajemen TI perguruan tinggi swasta di Pulau Sumatra. Penelitian ini menggunakan sampel sebanyak 90 perguruan tinggi swasta. Selanjutnya data diolah dengan menggunakan teknik Partial Least Square (PLS). Hasil yang diperoleh adalah sistem manajemen kinerja memediasi tata kelola TI dengan kinerja organisasi secara parsial, sedangkan kapabilitas TI memediasi secara penuh dengan kinerja organisasi. Artinya kapabilitas TI dapat mendorong tercapainya kinerja organisasi jika melalui sistem manajemen kinerja yang baik. Secara teoritis berkontribusi pada implementasi sumber daya teknologi yang dimobilisasi dalam sistem manajemen kinerja untuk meningkatkan kinerja perguruan tinggi. Sedangkan secara praktis menjadi pertimbangan bagi manajemen perguruan tinggi untuk mengembangkan sistem teknologi dan sistem pengukuran kinerja untuk mencapai keunggulan bersaing yang berkelanjutan.

Kata Kunci: Tata kelola TI; Kapabilitas TI; Kinerja organisasi; Sistem pengukuran kinerja.

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INTRODUCTION

The role of information technology (IT) is very important in the continuity of an organization to facilitate work to improve organizational performance (Raudeliuniene et al., 2021). Some literature states that information technology has an influence on knowledge management cycles that lead to improved overall organizational performance (Pratolo et al., 2023; Raudeliuniene et al., 2021; Tahar et al., 2022). This suggests that IT development will help every job to be more effective and efficient, further improving the organization's financial and operational performance (Pratolo et al., 2021), as well as to achieve competitive advantage and optimal performance (Chakravarty et al., 2013; Kim et al., 2011; Tahar et al., 2022). However, some research on IT development is mostly carried out in the private sector (Vejseli & Rossmann, 2017; Zhang et al., 2016), and rarely carried out in the Higher Education Institution (HEIs) sector.

With the unstoppable advancement of technology, HEIs are competing to promote their progress in the field of information technology. For example, during the pandemic, HEIs that already have online teaching capabilities are potentially better positioned to attract prospective students, while weaker competitors may be eliminated (Tahar et al., 2022). Since then, the issue of IT governance has become a concern for many parties and a new challenge for HEIs to maintain their quality and performance (Pratolo et al., 2023).

Currently, the performance of HEIs in Indonesia is assessed by accreditation ratings (Pratolo et al., 2020). The performance of HEIs proxied by the accreditation value also shows how well the management is carried out, as well as the extent to which the system aspects and personnel aspects have been managed properly (Pratolo et al., 2022). Given, Indonesia is one of the countries that has a large number of HEIs. It was reported in 2019 that the number of HEIs was 4,529 and was dominated by private HEIs, but the quality of HEIs in Indonesia is still considerably low. On the other hand, private HEIs only receives coaching funds of less than 6 percent of the budget (Pratolo et al., 2023), so that the main source of operational activities can be fulfilled through income from students (Wahyudin & Thomas, 2016). Therefore, private HEIs need to be able to improve their performance in order to survive, and compete with other universities.

In addition, some research on how organizations empower IT to improve their performance already exists, but the results obtained are not all significant. Some studies found that IT is not always successful in improving organizational performance (Cepeda & Arias-Pérez, 2019). Therefore, departing from the inconsistency of existing results, this study provides novelty by making the performance management system (PMS) a mediating variable. Previous research provides evidence that the use of IT through other complementary organizational resources such as PMS can provide information on how to pursue low-cost strategies, gain product efficiency, and develop organizational capabilities (Luo et al., 2012). The existence of PMS quality and optimal use of performance information can help top management make decisions, especially regarding

improving organizational performance. According to Pratolo et al. (2023), PMS is a prerequisite for IT development to make a better contribution to improving organizational performance, both financial and non-financial.

Based on the previous discussion, this study tries to test the role of PMS in mediating the relationship between IT governance and IT Capability with the performance of private HEIs on the island of Sumatra, Indonesia. Based on data published on the Higher Education Database web by the Directorate General of Higher Education, Ministry of Education and Culture of the Republic of Indonesia, private HEIs on the island of Sumatra are predominantly unaccredited (PDDikti, 2020). The data obtained compares private HEIs that have been accredited A by 0.13%, B by 17.12%, C by 28.66%, Excellent by 1.04%, Good by 9.08%, while those that have not been accredited are 43.97%. Thus, it shows that Indonesia's equal distribution of education quality could be more optimal. Meanwhile, the number of HEIs on the island of Sumatra is the second largest after Java. Thus, research on the performance of private HEIs on Sumatra Island is very urgent. Especially research on PMS because several previous studies have stated that PMS is one of the critical indicators for private HEIs to achieve their goals (Pratolo et al., 2023; Pratolo et al., 2022; Sofyani et al., 2022; Tahar et al., 2022). The quantity and quality of private HEIs in Sumatra Island are different. The results of this study can be used as a recommendation for HEI management to improve their organizational performance.

This research uses Resource Orchestration Theory explaining that an organization's sustainable advantage can realize the full value of its resources only if those resources are structured, combined, and managed effectively (Sirmon et al., 2011). So that this research contributes to the theoretical, namely treating the performance management system (PMS) as a mediation in which HEI resources, namely IT governance and IT capability, are mobilized in a more effective way which ultimately results in a sustainable competitive advantage for HEIs by developing resource orchestration theory. Practically, this research can be used for HEIs to improve performance by utilizing IT governance translated by the performance management system which will provide an increase in the performance of the HEI.

LITERATURE REVIEW

Resource Orchestration Theory

This research uses resource orchestration theory which is explicitly proposed in the literature by Sirmon et al. (2011). This theory integrates resource management and asset orchestration to form a more comprehensive framework to contribute to resource-based-value theory (Pratolo et al., 2022). Resource orchestration theory explains that an organization's sustainable advantage can realize the full value of its resources only if those resources are effectively structured, combined, and managed (Pratolo et al., 2022; Sirmon et al., 2011). Central to this theory is "resource mobilization", according to Sirmon et al. (2011), resources are mobilized and integrated into a more effective system or structure to achieve sustainable competitive advantage. HEIs that utilize technological resources into the structure, namely the performance management system, are believed to make it easier for HEI to achieve excellence and better performance.

IT Governance

According to Gondohanindijo (2017), IT governance is an organization that implements IT policies so that the desired outcomes of the organization direct the use of IT in procurement and services. IT governance is an integral part of the governance of private HEI carried out by leaders, structural positions, and relational mechanisms in the organization that enable IT to be a governance responsibility in supporting alignment and competitive value creation (Levstek et al., 2018).

For private HEI, IT governance can provide useful findings when maximizing IT investment (Alreemy et al., 2016). IT governance ensures that IT objectives are met and IT risks are mitigated so that IT provides value to sustain and grow the private HEI (Altemimi & Zakaria, 2017). According to the IT Governance Institute (ITGI), IT governance is an essential aspect of HEI governance, consisting of the leadership, organizational structure, and processes that ensure IT supports and extends HEI strategies and objectives (Levstek et al., 2018; Zhang et al., 2016).

Managing higher education involves teaching, administration and research (Sciarelli et al., 2020). The role of IT governance in HEI will guide all levels of the management process if implemented consistently (Anwar et al., 2021; Yunis & Telaumbanua, 2015). HEI has widely used IT governance based on the best implementation of several previous private HEIs and used it as the basis for implementing HEI governance (Yunis & Telaumbanua, 2015). To implement good IT governance, private HEI must implement an IT governance framework that suits the needs of HEI (Gondohanindijo, 2017). Seeing the role of IT in education must be supported by correct and good IT governance. The proper methodology or standard is needed to support the implementation of the IT governance structure (Yunis & Telaumbanua, 2015).

IT Capability

Information technology in organizations increases the organization's ability to manage the change process better, create new opportunities, and adapt existing processes to changing environmental conditions (Ahmadi & Letter, 2021). According to Bharadwaj (2000), IT capability is managing and disseminating information technology-based resources with other resources and knowledge. Information technology skills lead to related skills that can help internal organizational communication and create technical capabilities (Mogoale et al., 2021). IT capability in private HEI has various information technology infrastructure and human resources, such as technical capabilities in managing information technology (Ahmadi & Letter, 2021).

Zhang et al. (2016) found that IT capability adds value to assessing private HEI by providing additional explanatory power beyond traditional knowledge data. HEIs that operate in a competitive environment with a supportive government, favourable rules and regulations, superior IT, and sufficient knowledge capacity are expected to generate the increased speed of information technology, leading to improved performance (Mogoale et al., 2021). Managers must achieve long-term competitive advantage through strong IT capability and knowledge to meet changing demands and respond quickly to environmental developments (Panda & Rath, 2021).

According to Romney et al. (2012), using information technology in organizations will impact private HEI activities and development. Technology can refer to any tool, instrument, program, or system that increases productivity and creativity when used in the classroom so that student achievement can prepare for new roles in learning, living, and working (Panda & Rath, 2021).

Performance Management System

A PMS is an ongoing process to improve performance by setting individual and team goals that are aligned with the organization's strategic goals, planning performance to achieve goals, reviewing and assessing progress, and developing the knowledge, skills, and abilities of human resources (Soewarno et al., 2022). PMS is a method for consistently understanding the performance of individuals, teams, or even entire organizations. Appropriate PMS improves productivity, employee engagement and retention, innovation, corporate culture, and profits.

According to Douwe P. Flapper et al. (1996), the success and survival of an organization depends on its performance, which can be defined as "the way the organization carries out its objectives". Most modern organizations identify this need and spend funds to develop and implement effective PMS, but many variations can still be considered in organizational performance. To gain a competitive advantage, an organization's PMS should be designed to link employee performance expectations with organizational goals.

Effective and efficient higher education activities are related to PMS that are relevant to the characteristics of PMS, which are strongly tied to the role of its stakeholders, such as students and the community (Soewarno et al., 2022). Students will get academic services to realize their learning achievements in academic and non-academic activities. Likewise, the community absorbs university graduates by creating opportunities for the academic community to do practical work, conduct research, and conduct community service.

Organizational Performance

Organizational performance is the ability of an organization to achieve goals and optimize results (Yaakub & Mohamed, 2019). Organizational performance measures how efficiently and effectively an organization achieves its goals using a framework that can help understand the capabilities of employees, teams, and the competitive environment. Monitoring and optimizing organizational performance can ensure the correct use of resources and progress towards organizational. Soft quality management practices significantly impact complex administrative and technical practices and organizational performance. This means that leaders should give importance to different soft practices related to resource commitment and training, sharing quality vision among employees, focusing on student and stakeholder needs, and encouraging stakeholder relationships to have adequate quality management implementation, better innovation, and better organizational performance (Sciarelli et al., 2020).

Organizational performance is complex; measurement should reflect that complexity (Camilleri & Camilleri, 2018). A good assessment program provides multiple indicators because organizational performance tends to be complex. Private HEIs missions in higher education are diverse, assessment users' information needs vary, and private HEIs have many critical success factors (Rahayu et al., 2020). In addition, multiple surveillance

indicators are necessary because they must monitor unintended outcomes that may arise from deliberate changes introduced into the system. The level of organizational performance is determined by various factors, including operational efficiency, mergers and acquisitions, level of diversification, organizational structure, composition and style of the top management team or leadership, human resource management, and political manipulation or social influence on environmental conformity (Rahayu et al., 2020). To ensure this research is focused and concentrated, the construct of organizational performance, particularly the performance of some private universities, is measured exclusively through non-financial measures.

The non-financial aspects, in particular, are based on a set of theories and concepts proposed by Miller (2016), consisting of seven dimensions: effectiveness, productivity, quality, customer satisfaction, efficiency, innovation, and financial resilience. In addition to trying to obtain financial benefits, private HEI also carries out a "social function" to educate the life of the nation and state.

Hypothesis Development

The Effect of IT Governance on Performance Management Systems

The chances for successful performance management are higher when it is embedded in the management system (Douwe P. Flapper et al., 1996). According to resource orchestration theory, big data, information, and knowledge have become basic needs and resources for any kind of digital transformation which is an important method to gain competitive advantage (Sirmon et al., 2011). Private HEIs IT governance consists of leadership, organizational structure, and processes that ensure IT supports and extends organizational strategies and goals (Levstek et al., 2018; Zhang et al., 2016). From previous research, IT governance has an influence on the performance management system, because leadership, organizational structure and processes that support IT management to improve performance in accordance with goals are important factors for governance and organizational performance management (Alreemy et al., 2016; Vasconcelos et al., 2021).

In implementing PMS, several processes are needed, such as data generation in the form of rules, practices and systems; data collection in the form of policies, procedures, and systems needed which are carried out regularly; data analysis in the form of policies, procedures, systems to convert the collected data into the information needed; finally, the distribution of information needed to assist decision making (Nudurupati & Bititci, 2005). To support the process's running, private HEIs need IT assistance, and effective IT governance is needed to align the needs of the four activities above (Bovaird, 2005). For example, when private HEIs have determined the performance indicators that must be achieved, the organization must determine an effective and efficient way to collect, process, and report data so that the data can be used to help make decisions and provide feedback. Thus, effective IT governance can increase the effectiveness of PMS implementation (Tahar et al., 2022). Based on the description and explanation above, the hypothesis that can be tested is formulated as follows:

H₁: IT governance has a positive effect on performance management systems.

Effect of IT Capability on Performance Management System

IT capability is the organization's ability based on IT assets and knowledge to create performance value (Bharadwaj, 2000). According to Pratolo et al. (2021) Pratolo et al. (2021), IT affects PMS and improves effective and efficient performance. Thus, HEIs that have good IT will increase PMS. If there is clarity of organizational goals, satisfactory IT is expected to improve PMS for the better. The use of information technology is needed to help evaluate various activities and internal processes in higher education (Mulyawan & Christanti, 2022). IT capability directly contributes to improving HEIs processes such as coordination, investment in exchange, absorption capacity, and monitoring and control (Zhang et al., 2016). According to resource orchestration theory in the digital era, organizations must carefully orchestrate digital resources and use digitally enabled resource orchestration to create digital business models (Sirmon et al., 2011). Private HEIs that have good capabilities from human resources to assets in the form of good IT systems, will help their performance management processes. Support in the form of assets and human resource capabilities is needed, considering that investment in IT is a large investment. Based on the description and explanation above, the hypothesis that can be tested is formulated as follows:

H₂: IT capability has a positive effect on performance management systems.

The Effect of IT Governance on Organizational Performance

IT governance is part of the achievement of organizational governance. IT governance puts a structure for how the organization aligns IT strategy with strategic opportunities and ensures that the organization stays on track to achieve strategic organizational goals (De Haes & Van Grembergen, 2009; Harguem, 2021; Zhang et al., 2016). According to resource orchestration theory, recent developments in this theory categorize resources into operant resources (Sirmon et al., 2011). The role of information technology can be considered as an operant resource, according to Li and Jia (2018).

According to Harguem (2021), IT governance and organizational performance have a positive effect because IT governance is more likely to lead to better organizational performance when IT management capabilities are developed in line with business, showing rich shows the beneficial effects of strategic alignment on organizational performance. The strategic alignment will create better organizational performance, thinking about the entire decision and review of IT professionals in IT governance Liang et al. (2011). Based on the description and explanation above, the hypothesis that can be tested is formulated as follows:

H₃: IT governance has a positive effect on organizational performance.

The Effect of IT Capability on Organizational Performance

The use of IT Capability in most organizations involves large investments in IT (Panda & Rath, 2021). In addition, high and increasing IT spending forces leaders to consider the contribution of information technology to organizational performance (Zhang et al., 2016). According to resource orchestration theory, it is argued that each resource has its own characteristics, and the correlation of resources can produce certain potential advantages in the orchestration style (Li & Jia, 2018; Sirmon et al., 2011).

IT capability has a positive influence on organizational performance when human resources, infrastructure, stakeholder relationships, leadership styles, and contextual experiences are aligned (Mogoale et al., 2021). IT capability can assist organizations in achieving superior performance, it will be fully influenced by the progress of organizational processes (Chen et al., 2014; Ganbold et al., 2021). On the other hand, HEI have started to adapt IT for learning activities, such as using zoom, learning management systems (LMS), YouTube, etc. (Pratolo et al., 2023) Based on the description and explanation above, the hypothesis that can be tested is formulated as follows:

H₄: IT capability has a positive effect on organizational performance.

Effect of Performance Management System on Organizational Performance

Performance management is an opportunity for organizations to improve resource skills and drive high performance on a large scale (Soewarno et al., 2022). PMS is related to strategies to create a common understanding (Irfani et al., 2019). So that top management can align the understanding and actions of individuals in an organization. PMS is used to improve communication to achieve planned strategies, to achieve organizational goals (Ittner et al., 2003; Pratolo et al., 2023). PMS in HEIs tend to emphasize academic activities, research, teaching workload, financial support, publications, faculty and student activities (Thirumanickam & Ahmad, 2013). From the results of previous research, PMS is considered to improve organizational performance (Alam et al., 2021; Kumar et al., 2015; Soewarno et al., 2022). Based on the description and explanation above, the hypothesis that can be tested is formulated as follows:

H₅: Performance management system has a positive effect on organizational performance.

The Effect of IT Governance on Organizational Performance through Performance Management Systems

Lunardi et al. (2017) state that IT governance will help organizations to achieve optimal performance with a measurable PMS. The PMS is an important tool to help organizations achieve their goals (Pratolo et al., 2023). Individual skills and contributions and measurement of organizational goals are needed to develop important elements of the organization (Yaakub & Mohamed, 2019). Resource Orchestration theory by treating PMS as a mediation where the resources of the HEI, namely leadership, structure, processes that ensure that IT can be utilized properly and more effectively which in turn can produce sustainable competitive advantages for the HEI (Sirmon et al., 2011).

On the one hand, IT governance is a supporting aspect so that management processes, governance mechanisms, and practices can run well. Considering the logic in the development of hypothesis 1, where IT governance will support the implementation of PMS while PMS itself will lead to performance achievement, it can be predicted that PMS will have an intervening role in the relationship between IT governance and performance of HEIs.

Based on the description and explanation above, the hypothesis that can be tested is formulated as follows:

H₆: IT governance affects organizational performance through the performance management system.

The Effect of IT Capability on Organizational Performance Through Performance Management System

IT capability is the ability of an organization based on IT assets and knowledge, to create performance value (Bharadwaj, 2000). Thus, HEI treats the performance management system as a mediation where HEI resources in the form of assets and knowledge of technology can be mobilized in a more effective way which ultimately results in a sustainable competitive advantage for HEI by developing resource orchestration theory (Sirmon et al., 2011). According to Ghasemi et al. (2019), PMS supported by IT can provide more accurate, integrated, timely and relevant information. Based on the description and explanation above, the hypothesis that can be tested is formulated as follows:

H₇: IT capability affects organizational performance through the performance management system.

From the explanation of the hypothesis development above, the researcher created a model in Figure 1.

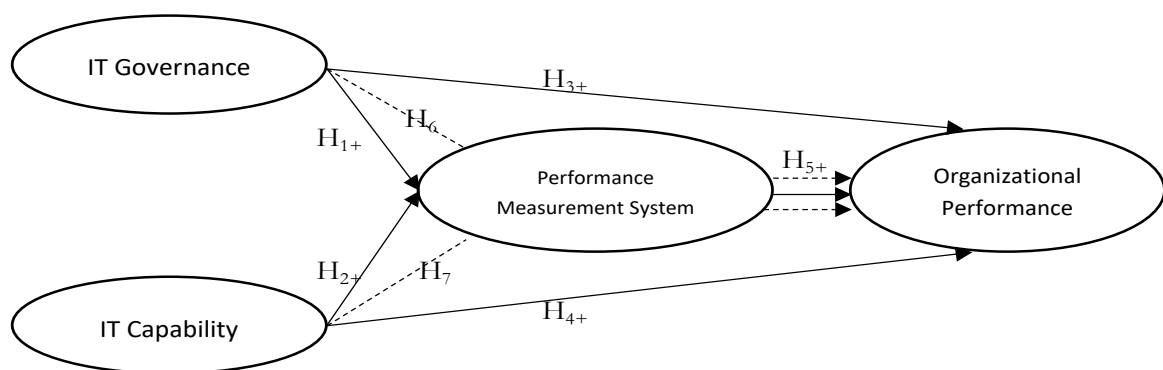


Figure 1. Research Model

RESEARCH METHODS

This research was conducted with a quantitative approach so that the research was more systematic and structured. The methodology in this research is a survey method by distributing questionnaires to 90 private HEI on the island of Sumatra. This type of primary data is obtained directly without any intermediaries with a questionnaire survey. The sampling technique uses convenience sampling by sampling at any unit with little or no planning involved. The sample criteria taken in this study are private HEI located close to the researcher's residence and accredited private HEI. Respondents in this study are management and IT management who have worked for at least 5 years. The reason for using this criterion is based on ease of access and private HEI that have been accredited are considered to better understand the statements submitted. The Table 1 shows the distribution of samples.

The questionnaires obtained from respondents were those that were completely filled out and capable of analysis. The present investigation determined the sample size by employing the methodology proposed by Hair et al. (1998)'s which involves the utilization of the "10 times rule" to determine the appropriate sample size. A minimum sample size of 100 is required, which can be achieved by using a 10 x 10 sample. The requisite sample size of 270 was attained for the present investigation.

Furthermore, the utilized data were primary data that were directly obtained from participants through the implementation of a Likert scale ranging from 1 to 5. The scale's endpoints were labelled as "strongly disagree" and "strongly agree," respectively. The measurement of IT governance and IT capability variables was adapted from the research conducted by Selig (2016) and Lien (2017), while the performance management system was adapted from the work of Asad and Mahfod (2015), and the organizational performance was adapted from the study conducted by Yaakub and Mohamed (2019). Additionally, the questionnaire underwent consultation and validation through the involvement of four expert professors in the field of accounting research, utilizing a survey approach.

Before hypothesis testing, this study has tested for bias that may occur in survey research. The bias test used is Common Method Variance (CMV), which is to determine that the data used does not have the potential for bias or error, such as self-reported bias, complexity, ambiguity, and scale format (MacKenzie & Podsakoff, 2012). The results obtained show a result of 40.03% less than 50%, meaning that the data does not have the potential for bias or error. The Partial Least Squares (PLS) method was employed before hypothesis testing. PLS is a preferred method due to its ability to enhance the complexity of the model, as noted by (Nitzl, 2016). The utilization of the PLS approach is deemed appropriate for this study due to its capacity to accommodate a relatively limited sample size, as previously noted by Chin et al. (2003). The utilization of Partial Least Squares (PLS) necessitates a three-stage process as outlined by Hair Jr et al. (2014) which includes (1) the specification of the model, (2) the assessment of the outer models in terms of their validity and reliability, and (3) the evaluation of the inner models.

Table 1. The Distribution of Sample

Description		Total	Percentage (%)
Province	Total	90	100
	North Sumatra	30	33.33
	South Sumatra	30	33.33
	Lampung	30	33.33
Types of HEIs	Total	90	100
	Polytechnic	5	0.06
	College	29	0.32
	University	44	0.49
	Institute	6	0.07
	Academy	6	0.07

RESULTS AND DISCUSSION

This study distributed 300 questionnaires, 270 questionnaires that could be processed with a percentage of 90% and 30 that could not be processed with a percentage of 10%. Before testing the hypothesis using PLS, validity and reliability tests were carried out by testing the outer model. The validity test consists of convergent validity and discriminant validity. Referring to Hair Jr et al. (2014) the outer loading value and average variance extract (AVE) are used to evaluate convergent validity (Table 2).

Tabel 2. Convergent Validity

Code	Indicator	Loading
<i>IT Governance (ITG) – AVE: 0.589</i>		
ITG1	My organization (HEI) defines roles and responsibilities well with respect to each IT governance component and process.	0.830
ITG6	IT governance processes at my college are well defined, documented and measured.	0.752
ITG9	My organization (HEI) has a Management Accounting Information System that facilitates the generation of internal information.	0.716
<i>IT Capability (ITC) – AVE: 0.507</i>		
ITC1	IT staff has the ability to learn and implement new technologies quickly.	0.844
ITC2	The IT staff at my organization know the important tasks of the college organization and are responsible for them.	0.712
ITC3	The technological infrastructure required to electronically connect the college with external parties is available today.	0.585
ITC4	My organization (HEI) has standardized various technological infrastructure components (i.e., hardware, network, and database).	0.812
ITC7	Staff at my organization use IT systems to improve the effectiveness and efficiency of decision-making processes.	0.711
ITC8	Staff use IT systems to decide how best to solve problems.	0.702
ITC9	Staff at my private university use IT systems to communicate and exchange information with others in the work group.	0.752
ITC10	Staff at my HEI use IT systems to communicate with internal and/or external parties.	0.513
<i>Performance Management System (PMS) – AVE: 0.528</i>		
PMS1	Vision/mission/values and strategy statements are clear and understood by all stakeholders.	0.680
PMS3	Job descriptions for all positions at my organizations (HEI) are clearly stated and followed.	0.861
PMS4	Work unit performance evaluations are communicated and conducted regularly.	0.789
PMS5	Lecturers & education personnel are actively involved in the review, development and implementation of the private HEIs Performance Management System.	0.601
PMS6	Lecturers and education personnel are given strong administrative support to improve their current managerial skills.	0.672
<i>Organizational Performance (OP) – AVE: 0.556</i>		
OP1	Conduct Quality Assurance of Academic Programs and Services	0.759
OP2	Having qualified lecturers	0.792
OP3	High quality graduates	0.712
OP4	Ensure that all study programs are accredited as excellent	0.692
OP5	Produce graduates who are hired within 6 months of graduation	0.804
OP6	obtaining grants from the government	0.764
OP7	Produce research in accordance with the provisions of the grant provider.	0.775
OP8	Generate research that has a direct positive impact on society.	0.698
OP9	Earn higher income.	0.744
OP10	Obtain higher financial surplus.	0.706

Based on the results presented in Table 2, it was found that several construct indicators had a loading value of less than 0.5 so it was recommended to be removed (Hair Jr et al., 2014), because it could affect the Cronbach Alpha and Composite reliability values in the reliability test.

Table 3. Discriminant Validity Test Result Using HTMT

	Heterotrait-monotrait ratio (HTMT)
IT Governance <-> IT Capability	0.190
Kinerja Organisasional <-> IT Capability	0.370
Kinerja Organisasional <-> IT Governance	0.492
Sistem Manajemen Kinerja <-> IT Capability	0.264
Sistem Manajemen Kinerja <-> IT Governance	0.491
Sistem Manajemen Kinerja <-> Kinerja Organisasional	0.650

Furthermore, Table 3 presents the results of the discriminant validity test. The Fornell-Lacker criterion and the Heterotrait-Monotrait ratio (HTMT) are widely accepted techniques for discriminant validity testing (Hair Jr et al., 2017). However, according to Henseler et al. (2015), HTMT can achieve higher levels of specificity and sensitivity compared to Fornell-Lacker with the criterion that all constructs are less than 0.85 and all are met (Shmueli et al., 2019).

After the validity test is fulfilled, the next is the reliability test to ensure the consistency of indicators in measuring constructs by looking at Cronbach alpha and composite reliability has been fulfilled according to Table 4 (Hair Jr et al., 2014). This can be seen from the Cronbach's Alpha and Composite reliability values which are greater than 0.6 and 0.7 respectively (Chin et al., 2003; Hair Jr et al., 2014). Because the results of the result measurement assessment have been fulfilled, hypothesis testing using PLS can be carried out.

Table 4. Reliability Test

Variables	Cronbach's Alpha	Composite Reliability
IT Governance	0.861	0.912
IT Capability	0.667	0.695
Organizational Performance	0.911	0.912
Performance Management System	0.785	0.858

From Table 5, the adjusted R² value shows a moderate to substantial level of 0.439 (Hair Jr et al., 2014; Henseler et al., 2015). This result indicates that 43.9% of the organizational performance variable is explained by the determinants in the model, while the rest is explained by other factors outside the model. Thus, the current research model is important to take into account the practical implications made.

Table 5. Hypothesis Results

Direct Relationship	Code	Coefficient	P-value	Conclusion
IT Governance → Performance Management System	H ₁₊	0,380	0.000	Supported
IT Capability → Performance Management System	H ₂₊	0,162	0.048	Supported
IT Governance → Organizational Performance	H ₃₊	0,180	0.027	Supported
IT Capability → Organizational Performance	H ₄₊	0,240	0.090	Not Supported
Performance Management System → Organizational Performance	H ₅₊	0.486	0.000	Supported
Indirect Relationship				
IT Governance → Performance Management System → Organizational Performance	H ₆₊	0.076	0.007	Partial Mediation
IT Capability → Performance Management System → Organizational Performance	H ₇₊	0.263	0.037	Fully Mediation
Adjusted R ² : 0.439				

Furthermore, in brief, all hypotheses are supported except the 4th hypothesis that IT capability has no effect on organizational performance. As for the mediation hypothesis, IT governance is only partially supported because the direct relationship between the variables is supported and finally for the mediation hypothesis IT capability is fully supported.

Furthermore, assessing the structural model as the measurement model is satisfactory (Hair et al., 2019). The assessment criteria that should be considered in addition to the coefficient of determination are the blindfolding-based cross-validated redundancy measure Q^2 , and assessing the out-of-sample predictive power of their model using the PLSpredict procedure (Shmueli et al., 2016). Q^2 values range from $0 < Q^2 < 1$, where the closer to 1, the better the model (Chin, 1998). In addition, a better level of predictive power can be indicated by the value of the RMSE and MAE PLS-SEM indicators, which are lower than the linear regression model (LM). If mostly the same, the PLS-SEM indicator has a lower RMSE and MAE than the linear regression model (LM), which indicates that the PLS-SEM model has moderate predictive power (Shmueli et al., 2019).

Table 5. Assessing Structural Models (PLSpredict and Q^2)

Indicators	Q^2 predict	PLS-SEM RMSE	PLS-SEM MAE	LM RMSE	LM MAE
OP10	0,157	0,629	0,482	0,652	0,508
OP2	0,091	0,542	0,468	0,600	0,495
OP3	0,110	0,524	0,408	0,619	0,480
OP4	0,224	0,556	0,425	0,569	0,431
OP5	0,143	0,551	0,409	0,608	0,453
OP6	0,025	0,665	0,499	0,698	0,534
OP7	0,097	0,628	0,473	0,685	0,518
OP8	0,004	0,602	0,470	0,736	0,524
OP9	0,107	0,572	0,413	0,558	0,442
OP1	0,048	0,571	0,475	0,691	0,542
PMS1	0,061	0,595	0,481	0,680	0,505
PMS3	0,111	0,665	0,493	0,693	0,491
PMS4	0,030	0,581	0,467	0,612	0,468
PMS5	0,072	0,651	0,471	0,717	0,541
PMS6	0,044	0,732	0,563	0,867	0,649

In the prediction test results in Table 6, the Q^2 value for endogenous variables is $0 < Q^2 < 1$, so it has a good observation value. Meanwhile, the PLSpredict results if the PLS-SEM analysis, compared to the naïve LM benchmark, produces a higher prediction error in the root mean squared error (RMSE) or the mean absolute error (MAE), then the prediction results fall into the moderate category (Hair et al., 2019).

The Effect of IT Governance on Performance Management Systems

HEI that have structures, processes and leadership that support all processes with IT were found to improve the performance management system (H_1). This finding is in line with the results of the research of Vasconcelos et al. (2021) which states that IT governance has an influence on performance management systems, because well-managed IT investment is an important factor for IT governance and management. These results are also in line with the findings of Holopainen et al. (2022), that businesses that have a strategy supported by good technology are proven to change the performance management system. HEIs that can define roles and responsibilities, have measurable work, flexible and consistent IT governance processes, and have a good management accounting information system will improve the performance management system.

Effect of IT Capability on Performance Management System

Similarly, the hypothesis regarding IT capability owned by HEI can improve the performance management system (H₂). As explained in the results of Pratolo et al. (2023), the effect of technology in the performance management system can be explained using the high level of uncertainty faced by private HEI with innovative technology. Thus, the involvement of technology can be very important to provide accurate information in the PMS. The findings also confirm the resource orchestration theory that big data, information, and knowledge have become the basic needs and resources for any kind of digital transformation which is an important method to gain competitive advantage.

The Effect of IT Governance on Organizational Performance

Furthermore, governance can improve HEI performance (H₃). This finding confirms the findings of Turel et al. (2019) and Sirisomboonsuk et al. (2018) that good IT governance can improve ROA, ROE, profit margin and performance of an organization. In addition, Harguem (2021) findings also state that IT governance can improve performance because good governance in line with business strategy will improve organizational performance.

The Effect of IT Capability on Organizational Performance

In contrast to IT governance, IT capability has no direct effect on improving HEI performance (H₄). These results contradict previous research (Chen et al., 2014; Ganbold et al., 2021). According to previous research, IT capability is an important factor to help an organization compete and achieve its goals (Ganbold et al., 2021). However, these results are in line with the results of Pratolo et al. (2023) which states that IT capability has no direct effect on improving performance, both financial performance and operational performance. This finding indicates that HEI has not maximally utilized technological advances in completing its work. Also, technological infrastructure and human resources on island of Sumatra HEI are inadequate. This may be because HEI must make large investments to have sophisticated technology, both financial and non-financial investments (Panda & Rath, 2021).

Effect of Performance Management System on Organizational Performance

Finally, performance management systems can improve organizational performance in higher education (H₅). PMS makes it easier for HEI to measure performance on lecturers and staff to be more measurable (Pratolo et al., 2023; Pratolo et al., 2022). PMS is used to establish communication to achieve the planned strategy, so that organizational goals can be achieved (Ittner et al., 2003). Sofyani and Nazaruddin (2019) added that PMS will help individuals to work according to the track because it is clearly formulated and structured.

The Effect of IT Governance and IT Capability on Organizational Performance Through Performance Management Systems

Indirect effects of IT governance and IT capability affect the performance of higher education organizations through PMS. The sixth and seventh hypotheses are in accordance with the theory used, that resources in the form of IT governance and IT capability are mobilized and integrated into a strong performance management system in order to achieve the expected college performance. Adequate IT governance and IT capability will have a significant impact on activities controlled by technology and integrated with PMS (Locke, 1975). Performance management systems have a key role

in internal decision making and also for external accountability purposes of public organizations (Czarniawska & Genell, 2002; Tucker & Parker, 2015). Similar to other public organizations, HEI can use PMS to make decisions for resource utilization. It appears that IT capability does not support the performance of PTS organizations directly, but when there is orchestration in the form of a performance management system, IT capability is fully mediated by the performance management system as an aspect of resource orchestration.

The results obtained that PMS mediates IT governance with organizational performance in higher education are only partial, while IT capability mediates fully. This means that IT capability will only improve organizational performance if mediated or through PMS. This finding is in line with Pratolo et al. (2023) that the effectiveness and efficiency of the procurement of goods and services in higher education must be in accordance with the semester learning plan.

The practical implication in this study is that HEI must pay attention to the implementation of PMS. This is because if IT is adequate, but the organization's PMS has not supported the distribution of IT to subordinates, it can cause a decrease in the performance of the college. Especially in utilizing assets and knowledge about IT to create performance value, it can only improve performance if it has a strong PMS.

CONCLUSIONS

This study aims to test and obtain empirical evidence regarding the role of PMS in mediating higher education resources in the form of IT governance and IT capability in improving performance. This research was conducted at private HEIs on island of Sumatra, Indonesia. The results showed that IT capability is not a factor that can improve organizational performance. IT capability can encourage the achievement of performance if through a good performance management system. Unlike the case with IT governance which can affect college performance either directly or mediated by PMS. Theoretically, this research is in accordance with resource orchestration theory that it is necessary to mobilize and integrate technological resources with PMS in order to achieve sustainable competitive advantage. This study confirms the findings from Asiaei et al. (2021) that PMS implementation could drive the orchestration of other internal resources to achieve more optimal company performance.

The practical contribution of this research can be a consideration for HEI management to develop technology governance and PMS implementation to achieve organizational goals. This study also provides results that IT capability at private HEIs on the island of Sumatra is still low, both from asset capabilities and human resources cannot affect the performance of private HEIs. The results of this study provide implications that it is necessary to improve IT capabilities in terms of assets and human resources. Furthermore, it is not enough for private HEI to have IT resources alone to achieve high organizational performance, but a system is needed that is able to orchestrate it with other resources through performance appraisal. This research still has limitations, namely that it was only conducted at private HEI on island of Sumatra, so that the research results cannot be generalized more broadly, so that suggestions for future research can add a wider range of subjects.

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