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The Effect of Enterprise Resource Planning (ERP) on Performance with Information Technology Capability as Moderating Variable

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A B S T R A C T

This study aims to gain an understanding of the role of technological capability as a moderating variable on the effect of ERP implementation on operational performance. Companies are expected to utilize information technology capability to encourage the sustainability of information technology developments. This study used secondary data from companies that have implemented ERP in Indonesia. The data were tested for validity and reliability and classical assumptions. It used moderated regression analysis by considering technological capability as a moderating variable. The sample taken consists of companies in Indonesia that have used ERP for at least three years. The result indicates that there is an effect ERP implementation on operational performance but there is no effect of technology capability as a moderating variable on the effect of ERP implementation on operational performance. This study provides theoretical and practical contributions by explaining how to build IT capability so that the implementation of ERP drives th operational performance of business processes. This implies the importance of companies implementing ERP and understanding ERP development systems such as good corporate strategies, executive support, and changes in business processes. The results of this study imply that there are factors that strengthen or weaken the effect of ERP implementation on operational performance in addition to IT capabilities.

A B S T R A K

Penelitian ini bertujuan untuk mendapatkan pemahaman tentang peran kapabilitas teknologi terhadap pengaruh im-plementasi ERP kinerja operasional. Perusahaan diharapkan dapat memanfaatkan kapabilitas teknologi informasi untuk mendorong keberlanjutan perkembangan teknologi informasi. Penelitian ini menggunakan data sekunder dari peru-sahaan perusahaan yang sudah menerapkan ERP di Indonesia. Data kemudian di uji validitas dan reliabilitasnya dan dilakukan pengujian asumsi klasik. Metode analisis yang digunakan adalah analisis regresi moderasi dengan memper-timbangkan variabel pemoderasi kemampuan teknologi. Sampel diambil pada perusahaan di Indonesia yang telah menggunakan ERP setidaknya selama tiga tahun. Hasil penelitian menunjukkan bahwa terdapat pengaruh antara pene-rapan ERP terhadap kinerja operasional tetapi tidak terdapat pengaruh moderat pengaruh penerapan ERP terhadap kinerja operasional, hal ini berimplikasi pentingnya perusahaan yang menerapkan ERP memahami sistem pengemban-gan ERP seperti Strategi perusahaan yang baik, dukungan eksekutif, serta perubahan proses bisnis.Hasil penelitian ini menyiratkan bahwa ada faktor memperkuat atau memperlemah pengaruhi penerapan ERP terhadap kinerja operasional selain kapabilitas TI.

1. INTRODUCTION

Global business developments encourage companies to increase their competitiveness. Information Systems and Information Technology (IT) are often used to improve service, effectiveness, timeliness, and reduce costs. In this case, Enterprise Resource Planning (ERP) has become a concern in the development of business technology because of its benefits for the business world. ERP is an integrated information system to support organizational process functions so that they can be more efficient and effective. The need for the

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application of IT is important because it can increase productivity, efficiency, and effectiveness (Kim, 2020).

ERP software can integrate various functions within the organization. The process of integrating functions within the company is expected to provide products or services on time and at the right price. If the company's main activity utilizes ERP software, it is expected that company operations will be more effective, efficient, and it can also allow information interaction and collaboration within the company (Schlichter, Klyver, & Haug, 2020). The main goal of ERP implementation is to integrate all functional areas within the company so that the flow of information between functions can go well (Rainer & Cegielski, 2013).

Internal control is an important part of achieving company goals because the company goals are expected to be achieved efficiently. Control within the company is carried out on all entities within the company to achieve efficient operational activities, reliability of financial reports, and compliance with existing regulations. In this case, ERP software developers have also developed controls inherent in ERP systems (Moriss, 2011). IT capability can be in the form of physical or non-physical IT investment which is made usually in the form of intangible assets. One of the IT capabilities that play a role in encouraging the achievement of better performance from the organization is the company's internal control. The company's ability to learn about change and control risk provides a decisive contribution to the company's performance achievement. In addition the company's learning ability can control the extent to which the company understands its environment from the accumulation of organizational knowledge (Nguyen et al., 2017).

Several studies on ERP that link ERP implementation with performance achievement have been carried out in Indonesia. For example, Wicaksono, Mulyo, & Riantono (2015) found that ERP implementation has a positive impact on performance: namely quantity of work, quality of work, job knowledge, creativeness, dependability, and personal qualities. Nawawi (2018) also examined the effect of implementation on company performance in the Indonesia Stock Exchange with the moderating variables of business strategy and organizational capability. It was found that ERP implementation is mediated by the company's strategy and capabilities and allows the company to achieve better financial performance. In addition, other findings indicate an increase in operational performance which can be seen from the decrease in waiting time (the time it takes from the time the order is placed until the service is provided) along with the implementation of ERP (Adiel, 2020).

This present study is different from the previous ones because it looks at the company's performance from the aspect of the company's operational performance while the previous research uses financial performance measures. This study is also different from previous research because it sees company capability as a variable that strengthens or weakens ERP implementation in Indonesia. This interaction model is still rarely studied in Indonesia. However, Meijer, Ketsiama, & Gunawan (2017) revealed conflicting research results. They found that there was no accumulated benefit from implementing ERP. Other contradictory y results were also found in the study of De Loo et al, (2013), examining the effect of ERP implementation on the non-financial performance of small and medium-sized companies in the Netherlands. One of the findings of De Loo et al., (2013) revealed that small and medium-sized companies that had implemented ERP in the previous three years did not show a lower amount of non-financial performance, this shows that ERP implementation is not the only factor that drives performance improvement.

The IT capability of the company is the ability to mobilize and use resource-based IT by combining available resources with other resources (Bharadwaj, 2000). The ability and performance of the company have a construct with complex relationships. In addition, information system enables companies to get better performance by having the capability to configure products to have better quality by managing organizational resources. Rehman, Mohamed, & Ayoup, (2019) suggest that companies should gain higher profits by developing their capabilities compared to their existing competitors. Therefore, IT capability is one of the supporting elements for achieving organizational performance. This study, therefore, attempts to use IT capability as a moderating variable.

Achieving the maximum performance can be supported by the company's capability to reengineer business processes that make fundamental changes in organizational management, change management strategies such as education and training. This has a positive effect on system performance through adaptation to business changes and ensuring the continuity of business processes (Parks, 2018). One of the latest developments is the use of cloud computing-based ERP which provides real-time

integration of business processes, and helps manage effective cross-functional operations in business organizations (Gupta et al., 2018; Yu, et al., 2017).

From the existing research gap, the researchers suggest that IT investment through ERP implementation is not always in line with the performance benefits obtained. As revealed by Badewi et al., (2018), it is important to look at other factors that support the relationship between IT investment (in this case ERP implementation) and performance. The study looks at the IT capability factor as an important variable between ERP implementation and company performance (Ringim, Razalli, & Hasnan, 2012). IT capability is defined as the company's ability to use resource-based IT by combining existing resources within the company, namely IT infrastructure resources, human resources, and intangible resources (Bharadwaj, 2000). Therefore, the purpose of this study is to analyze how the IT capability factor affects the relationship between ERP implementation and operational performance. From this view, it is obvious that this study is different from the previous ones, in which its looks at IT capability from a product point of view. Besides, this study tries to see IT capability as an existing resource within the company.

2. THEORETICAL FRAMEWORK AND HYPOTHESES

Theory of Resource-Bases View

Resource-Bases View (RBV) theory is used to link strategy with company resources, with an approach to formulating strategies to develop a competitive advantage. RBV theory is also a theory that explains what companies do in order to compete so that they get a competitive advantage in managing their resources in accordance with the company's capabilities (Bharadwaj, 2000). With the RBV theory, the company has a collection of capabilities and resources. By having such capabilities and resources, the companies can ultimately create a competitive advantage. Moreover, RBV theory states that differences in company performance are possible when an organization or company has valuable resources while other organizations do not (Almarri & Gardiner, 2014). Therefore, from the RBV point of view, a company is a unique set of capabilities and competencies that influence its evolution and strategic growth.

Enterprise Resource Planning

Enterprise Resource Planning (ERP) system is widely implemented as the backbone of various manufacturing and service companies. The system is designed to overcome the problem of fragments of information or the big stock of information in a business organization. The implementation of the latest ERP technology currently utilizes the development of digital technology (for example, the use of web-based ERP, utilizing cloud computing and, social network computing) to further improve mobility, communication effectiveness, and efficiency, with the hope that strategic and competitive advantages will increase (Ranjan, 2010; Jha, & Pal, 2017). Flexibility in ERP implementation is also needed to provide significant benefits for companies and increase competitiveness.

Erwanto & Zusi (2020) identified several factors that determine the success or failure of ERP implementation, namely: project management, change management, compatibility between business and new information systems, internal audit activities, and consulting and planning activities. They also found a link between project management and change management, internal audit activities, consulting activities, planning activities, and the fit between business and new information systems. As based on this research, the critical success factors of ERP implementation include strategic initiatives, executive commitment, human resources, project management, information technology, business processes, training and communication, and project support as well as software support and selection. An interesting issue in the determinants of the two researchers is that there is compatibility between business and new information systems with consulting and planning activities.

IT Capability

By using Resource-Based Value (RBV) theory, several researchers have revealed that Information Technology (IT) Capability is an inseparable part of creating IT value (Bhatt & Grover, 2005). According to Bharadwaj (2000), IT capability itself is the company's ability to mobilize and use resource-based IT by combining existing resources with other resources. Bharadwaj (2000) categorizes resources as follows; 1) tangible resources, namely IT infrastructure, 2) IT human resources in the form of skills and 3) intangible IT resources such as assets in the form of knowledge, and customer orientation. The large investment that the company has spent in ERP development does not necessarily make the company profit in the short term. It can even have the potential to lose due to implementation failure if the company does not have the capability to take full

advantage of ERP implementation in the organization. Investing a large amount of money will be inefficient and effective without IT capability. Therefore, it is important that the company has the capability to orchestrate all assets and resources in an integrated manner to benefit from ERP implementation (Badewi et al., 2018).

Perfomance

Performance is the achievement of the work of an official, an implementation from the responsibility center when carrying out the manager's authority. Performance is classified into two, namely: (1) economic performance, and (2) task performance. The ERP system is an excellent tool for formal management control system because it helps companies identify inefficiency as early as possible (Syida, Suhaimia, & Nawawia, 2016). Task performance focuses on how well a structural officer of the responsibility center works to carry out the functions of planning, coordinating, and controlling the activities of his responsibility center. In implementing ERP, it is necessary to look at the performance of ERP implementation because the concept of business performance, in general, can be said to be an organization's financial benefits, operational improvements to intangible benefits for the organization (Elragal & Al-Serafi, 2011; Elragal & Moutaz, 2012).

The Effect of ERP Implementation on Operational Performnace

Some previous studies have provided evidence for the ERP implementation and its effect on the company's operational performance. For example, Elragal & Al-Serafi (2011) revealed that the concept of company performance can be generalized as financial benefits, improvement of company operations, and intangible benefits within the company. The ERP implementation could increase significantly the company's operational performance. Besides that, the implementation of each module in ERP has a positive impact on the operational performance of the organization (Sa-leh & Thoumy, 2018). In addition, ERP implementation with business process reengineering has a positive effect on operational performance (Saleh & Thoumy, 2018; Olawumi & Olusegun, 2019). Therefore, the first hypothesis is stated as follows:

H_1: ERP implementation affects operational performance

The Moderating Effect of IT capability

The company's capabilities and its performance have a construct with a complex relationship. In essence, information systems allow companies to get better performance by configuring products to have a better quality (Gupta et al., 2019). Rehman, Mohamed, & Ayoup (2019) suggested that companies would gain higher profits by developing their capabilities to be better compared to their existing competitors. In ERP implementation, it is necessary to have a consultant to support system development. In this case, a good consultant can provide the company's technical capabilities in ERP implementation. Technical capabilities that can be provided by consultants can be through the transfer of knowledge on existing development practices. Therefore, it can be indicated that technical skills which are part of IT capabilities strengthen the IT implementation process which will eventually create a better operational performance (Bingi, Sharma, & Godla, 2019; Madinos, 2012).

ERP implementation requires the availability of skilled human resources can implement ERP well. Therefore, having trained human resources is important in increasing added value that leads to achieving better company operational performance (Nwankpa, 2015). The availability of IT capabilities in the form of managerial and technical capabilities as well as skilled human resources will strengthen the influence of ERP implementation on operational performance. In addition, developing company capabilities will improve company performance and will indirectly strengthen the relationship between IT implementation and performance. Schlichter et al. (2020) revealed that the complexity of information technology is an important factor in achieving company performance. Unfortunately, not all companies are able to provide the IT resources they need properly. There are differences in the interaction (role of moderating variables) of Information Technology complexity on the relationship between growth and performance. Companies with high information technology complexity show low profits compared to companies with low complexity information technology. Therefore, the second hypothesis is stated as follows:

H_2: Information technology capabilities either strengthen or weaken the relationship between ERP implementation and operational performance.

Based on the theoretical framework and previous studies, the conceptual framework in this study is presented in Figure 1.

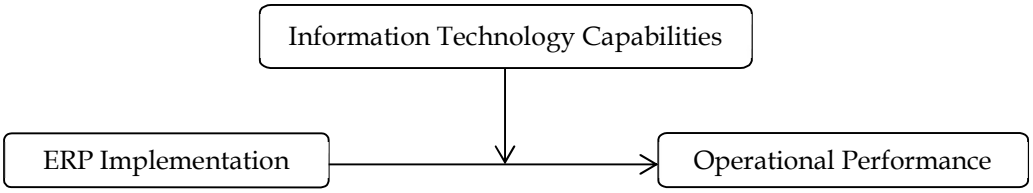

Figure 1. Conceptual Framework

3. RESEARCH METHOD

Research Sample

This study used the unit of analysis of a non-banking companies listed on the Indonesia Stock Exchange that has implemented ERP. Banking is not taken as a sample because it has special characteristics in ERP implementation. Identification of companies that use ERP was done by means of content analysis of published financial reports which state that the company has implemented or used ERP.

The questionnaires were distributed during two months, from April to May 2018 to 46 companies. Each company was given two to four questionnaires to the relevant managers and those that have used ERP system to study its effect on operational performance. A total of 184 questionnaires were distributed to them.

Data Collection Method

This study used the data taken from the companies that have implemented ERP. They were identified as having implemented ERP and it can be seen from the annual report of the company's website, and direct questions on the statement list (questionnaire). They were taken suing a purposive sampling by selecting manufacturing companies listed on the Indonesian stock exchange: they have implemented SAP and Oracle-based ERP. SAP and Oracle as criteria for various types of ERP because they dominate almost part of the ERP market in Indonesia are controlled by SAP (49%) and Oracle (22%) the rest are various with existing ERP products such as Microsoft Dynamics, JD Edwards and others (Yulizar & Govindaraju, 2017).

The data were collected by using questionnaires distributed to the Top Management and Middle Management as the respondents who have implemented RP. In addition, the researchers conducted interviews with top management to clarify the company's conditions for ERP implementation, IT capabilities, and measurement of company operational performance. Each company was contacted to find out which departments were using ERP and sent a questionnaire with the number as functional areas that have implemented ERP.

The pilot test was also conducted to test the validity and reliability of the questionnaire given to the respondents. It was done by sending 30 respondents to two different companies, the results showed that all questions were valid and the relationships between variables showed good reliability. The sample selected as the pilot test would not be included as respondents in the study. A total of 184 sets of questionnaires have been sent to respondents in 46 different companies.

Operational Definition of Variables and Their Measurement

It is stated by Madapusi (2011) that ERP implementation has a significant effect on operational performance. In some previous studies, it is also stated that increasing operational performance is considered an intangible benefit for organizations (Elragal & Mountaz, 2012). In this context, ERP implementation is said to be the backbone of many of the world's major manufacturing and service industries. ERP is designed to address groups of information that exist to become integrated information. In this study, ERP implementation refers to 9 research dimensions of Muscatello (2008), namely: 1) strategic initiative 2) executive commitment 3) human resources 4) project management 5) information technology 6) business processes 7) training 8) communication & project support 9) support & election. From the nine dimensions of the study, a list of perceived statements was made with a five-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5).

In this study, the operational performance has five performance dimensions of Madapusi &

D'Souza (2011), namely 1) availability of information 2) quality of information 3) standardization 4) inventory management 5) timely delivery. the existence of the five dimensions of operational performance with the choice of a five-point Likert scale modification ranging from "strongly disagree" (1) to "strongly agree" (5).

Bharadwaj (2000) categorizes resources in three dimensions, namely; 1) resources in the form of IT infrastructure, 2) IT human resources in the form of skills and 3) intangible IT resources such as assets in the form of knowledge, and customer orientation, research on developing IT capability instruments using these three dimensions (Erkmen, Günsel, & Altındağ, 2020). IT capability, measured from three dimensions consisting of 1) managerial capability, 2) technical capability, and 3) human resource support. Each variable was measured on a five-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5).

Analysis Method

The study used a survey method with cross-sectional data for all companies listed on the Indonesia Stock Exchange and/or at the functional level implementing ERP. The questionnaire distribution was conducted in one time data collection. The researchers used descriptive statistical analysis to describe or provide an overview of the object under study with population data or samples as they are without making conclusion and analysis (Gujarati, 2020). The researchers also used multiple linear regression analysis to see the effect of the independent variable on the dependent variable. The model of the moderated regression analysis of this study is.

$$KNO = a + b_1PEP + b_2KTI + b_3PEP\ KTI + e \quad (1)$$

KNO = Operational Performance
PEP = ERP Implementation
KTI = Information Technology Capability
a = constant
b_1 = coefficient of ERP Implementation
b_2 = coefficient of Information Technology Capability
b_3 = coefficient of moderated variable

This is because this research is more about testing the existence of information technology capabilities as a moderating relationship between ERP implementation and operational performance. In addition, the classical assumption test was also carried out to ensure that the data were ready for further analysis by using heteroscedasticity, multicollinearity, and autocorrelation and normality tests.

4. DATA ANALYSIS AND DISCUSSION

Descriptive statistics

A total of 184 questionnaires were distributed to 46 companies and 140 questionnaires were returned. Of these data, 136 were said to be eligible for the process. The descriptive statistics shown in Table 1 provide an overview of the mean, Cronbach's, reliability, and of each variable. A validity test by looking at the product-moment correlation was carried out to determine whether the statement item reveals exactly what is being researched (Ghozali, 2013). Table 1 reveals that all statement items are valid with a significance value of <0.05. The results of the reliability test by looking at the consistency of the statement items show that the coefficient value of Cronbach's Alpha of the variables of enterprise resource planning implementation, IT capabilities, and operational performance are all above the value of 0.7 These results prove that the variables of this study are reliable.

This study also tested the classical assumption with normality, multicollinearity, and homoscedasticity tests. The normality test shows the Asymp.Sig value of Kolmogorov Smirnov 0.207 (greater than 0.05). In other words, the result of the normality test in this study indicates that the research variables used are normally distributed. This research has also been tested for its multicollinearity, with the result showing that the variables of Enterprise Resource Planning implementation, IT capability, and operational performance have a tolerance value > 0.10 and a VIF value < 10. This indicates that there is no multicollinearity in the regression. A Heteroscedasticity test was also conducted to test whether in the regression model there was an inequality of variance from the observational residuals. With the Glejser test, each independent variable > 0.05, it can be concluded that there are no symptoms of Heteroscedasticity in the regression model mode.

Table 1. Descriptive Statistics of Research Variables

Variables	Dimensions	Indicators	Mean	Correlation Coefficient	Signif.	Cronbach's alpha
ERP Implementation	Strategic Initiatives	PEP1	3.532	0.381	0.000	0.812
		PEP2	3.234	0.814	0.000	
	Executive Commitment	PEP3	3.417	0.765	0.000	
		PEP4	3.093	0.793	0.000	
	Human Resources	PEP5	3.222	0.865	0.000	
		PEP6	3.206	0.823	0.000	
	Project management	PEP7	3.312	0.798	0.000	
		PEP8	3.258	0.848	0.000	
	Information Technology	PEP9	3.401	0.841	0.000	
		PEP10	3.315	0.882	0.000	
	Business Process Training	PEP11	3.273	0.854	0.000	
		PEP12	3.086	0.857	0.000	
		PEP13	3.174	0.862	0.000	
	Comm. & Project Support	PEP14	3.765	0.793	0.000	
		PEP15	3.643	0.706	0.000	
	Support & Selection	PEP16	3.596	0.855	0.000	
		PEP17	3.622	0.827	0.000	
IT Capability	Managerial Capabilities	KTI1	3.881	0.826	0.000	0.902
		KTI2	3.563	0.725	0.000	
		KTI3	3.876	0.704	0.000	
	Technical capabilities	KTI4	3.785	0.853	0.000	
		KTI5	3.908	0.827	0.000	
		KTI6	3.764	0.726	0.000	
	HR Supports	KTI8	3.822	0.727	0.000	
		KTI9	3.874	0.732	0.000	
		KTI6	3.923	0.718	0.000	
Operational Performance	Information Availability	KNO1	3.451	0.827	0.000	0.882
		KNO2	3.195	0.729	0.000	
	Information Quality	KNO3	3.326	0.872	0.000	
		KNO4	3.223	0.837	0.000	
	Standardization	KNO5	3.262	0.812	0.000	
		KNO6	3.475	0.843	0.000	
	Inventory Management	KNO7	3.451	0.865	0.000	
		KNO8	3.266	0.862	0.000	
	On time Delivery	KNO9	3.607	0.835	0.000	

Hypothesis Testing

The Moderation Analysis Regression analysis was also carried to see the effect of implementing ERP on operational performance with IT capability as a moderating variable. The feasibility test of the model was also carried out to see whether the regression model used is fit. The feasibility test of the model was carried out by looking at the calculated F value of 52.304 and the significance of 0.007 (Table 2.). The test results reveal that the p-value is less than 0.05. This means that the IT capability variable and ERP implementation have a significant effect on operational performance.

Table 2. F-Test Results

Model	Sum of Square	df	Mean Square	F	Sig.
Regression	11,358.869	3	3,778.278	52.304	0.007
Residual	13,230.021	136	71.387		
Total	24,289.864	139			

As presented in Table 3, it is found that the coefficient value of ERP implementation has a value of 2.745 and a significance of 0.007 (<0.05). It shows that the ERP implementation has a positive effect on operational performance. In other words, the first hypothesis is accepted. The result of the interaction test between IT capability and ERP implementation shows a coefficient value of -0.192 and a significance value of 0.840. The significance value is greater than the significance level used (0.8403> 0.05). Thus, it can be concluded that the IT capability variable does not moderate the effect of ERP implementation on operational performance.

Table 3. Hypothesis Test Results

Model	Coefficient	Std. Error	t-stat.	Sig.
(Constant)	1.269	0.255	4.975	0.000
PEP	2.745	0.983	2.794	0.007
PEP*KTI	-0.192	0.939	-0.204	0.840

Description: PEP = ERP Implementation, KTI = IT Capability

Discussion

The effect of ERP implementation on operational performance

The result indicates that ERP implementation has a positive effect on operational performance. It is consistent with Nuraini et al. (2018) and Cottelleer & Bendoly (2006) concluded that ERP implementation has a significant and positive effect on operational performance. When the implementation of ERP increases, the operational performance also increases or the other way around. This is not consistent with the research of Wieder et al. (2006) and De Loo (2013) which states that ERP implementation has no effect on operational performance.

In general, from the analysis, it can be concluded that the implementation of ERP in an organization has a positive effect on operational performance as measured by 1) information availability, 2) information quality, 3) standardization, 4) inventory management, and 5) proper delivery time. The availability of adequate information within the company will help make decisions faster and will certainly increase profits in transactions; this is what makes ERP play a role in measuring company performance by providing useful information to help make decisions for internal, namely managers within the company.

Information quality is generally seen from the relevance of information when used by the users. ERP system is designed to process information, determine alternative strategies, and management analysis that can later help make decisions. Companies that implement ERP are able to predict the future with more accurate historical data so that the relevance of the information generated can help decision-making for investors (Elragal & Moutaz, 2012). Companies that use ERP in managing their financial information benefit from standardized procedures through ERP software. In system development, especially the use of ERP, the implementation of the ERP system is good. The rules of ERP implementation are used to ensure the system can be used. These rules are in the framework used during system development such as 1) Determining a good strategy 2) commitment from company leaders and company support, 3) availability of server-based Information Technology good and 5) changes in business processes. A well-run implementation encourages standardization of procedures and management of complex information systems so as to improve the quality of information. It can be concluded by using ERP to standardize procedures and create certainty in the company's operating activities (Tarigan, Suprapto, & Basana, 2019).

Database utilization in ERP facilitates the process of updating data, adding data, editing and deleting data directly. By utilizing network data via the internet—a system with a combination of applications and business procedures—can provide real-time information to company management. Besides that, the use of network data in ERP makes the presentation of information easier and timelier, as well as the use of a computer system for financial reports that can be processed in a timely manner (Trigo, Belfo, & Estébanez, 2014).

The ERP implementation—supported by the use of network data for transformation activities outside the organization—can make easier to carry out the sales and purchase processes involving external parties. Utilization of ERP implementation can encourage the modernization of information management such as the use of the cloud, affects the company's ability to manage and distribute inventory in a timely and accurate manner and communicate with external parties better. This encourages a better distribution and process of documenting information (Al-Shboul, 2019).

The moderating role of IT capabilities

The result indicates that IT capability did not strengthen the effect of ERP implementation on operational performance. It shows that IT capability could not moderate the effect of ERP implementation on operational performance. It is probably due to the unpreparedness of companies that are implementing ERP for the first time, where most of the respondents have implemented ERP for less than three years. The level of managerial capability in the IT field, technical capability, and human resource support in the IT field is still low. Therefore, it makes it difficult to develop and implement ERP within the company.

The condition above, in turn, has affected the effectiveness of the company's operational performance. The company's lack of preparation in implementing ERP such as the availability of infrastructure and the accompanying technology environment are the main factors causing the underutilization of ERP. Another contributing factor is that the majority of respondents were State-Owned Enterprises (BUMN), which covers 80 percent of the total sample. The ERP implementation in SOEs is generally solely to comply with the 2014 SOE Ministerial Regulation concerning Guidelines for the Preparation of SOE Information Technology Management and less focus on improving operational performance.

5. CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

This research aimed at determining the effect of ERP implementation on operational performance with the moderating variable of IT capability as measured both partially or simultaneously. The result indicates that the first hypothesis which states that there is an effect between ERP implementation on operational perfor-mance is proved. Therefore, the better ERP implementation in the company, the better the operational perfor-mance is. However, the result of the study revealed that there is no moderating effect on the effect of ERP implementation on operational performance. Planning in ERP implementation that is not mature in practice can lead to ERP implementation failure, due to the complexity of the ERP system.

This study suggests that the companies that implement ERP to understand well the internal envi-ronment such as corporate strategy, executive support, business process changes, and the external environ-ment, such as the development of information technology, network development, availability of support in maintenance) in ERP system development. Good understanding encourages better ERP implementation and ultimately to improve operational performance.

This study has limitations due to the small response rate of the existing sample because the research-ers had difficulty obtaining the primary data directly from ERP users in companies that implement ERP. Fur-ther research should develop this thus by adding other variables to see what other factors strengthen or weaken the influence of ERP implementation on operational performance. They can be employee behavior factors, organizational culture, and internal control. For the companies implementing ERP, they should in-volve a good development system In order to improve operational performance; the development of a good system involves factors, such as corporate strategy, executive support, and changes in business processes.

REFERENCES

Adiel, L. (2020). Pengaruh ERP terhadap perbaikan pelayanan waktu tunggu dan waktu tempuh TransJakarta pada ruas Jalan Sudirman-Thamrin. *Jurnal Mitra Teknik Sipil*, 3(4), 266-294.

Almarri, K. & Gardiner, P. (2014). Application of resource-based view to project management research: supporters and opponents. *Procedia - Social and Behavioral Sciences*, 119, 437–445.

Al-Shboul, M. A. (2019). Towards better understanding of determinants logistical factors in SMEs for cloud ERP adoption in developing economies. *Business Process Management Journal*, 25(5), 887–907.

Badewi, A., Shehab, E., Zeng, J., & Mohamad, M. (2018). ERP benefits capability framework: orchestration theory perspective. *Business Process Management Journal*, 24(1), 266–294.

Bhatt, G. D., & Grover, V. (2005). Types of information technology capabilities and their role in competitive advantage: An empirical study. *Journal of management information systems*, *22*(2), 253-277

Bharadwaj, A. S., (2000). A Resource-Based Perspective on Information Technology Capability and Firm Performance: An Empirical Investigation. *MIS Quarterly*, 24(1), 169–196.

Bingi, P., Sharma, M. K., & Godla, J. K. (1999). Critical Issues Affecting an ERP Implementation. *Information Systems Management*, 16(3), 7–14.

Cotteleer, M. J. & Bendoly, E. (2006). Order lead-time improvement following enterprise information technology implementation: an empirical study. *MIS quarterly*, 643-660.

De Loo, I., Bots, J., Louwrink, E., Meeuwsen, D., van

Moorsel, P., & Rozel, C. (2013). The effects of ERP-implementations on the non-financial performance of small and medium-sized enterprises in the Netherlands. *Electronic Journal of Information Systems Evaluation*, 16(2), 103–115.

Elragal, A. A. & Al-Serafi, A. M. (2011). The effect of ERP system implementation on business performance: An exploratory case-study. Communications of the IBIMA, 670212, 1-19.

Elragal, A. & Moutaz, H. (2012). The Future of ERP Systems: look backward before moving forward. *Procedia Technology*, 5(1), 21–30.

Erkmen, T., Günsel, A., & Altındağ, E. (2020). The role of innovative climate in the relationship between sustainable IT capability and firm performance. *Sustainability*, 12(10), 4058.

Erwanto, E. D. & Zusi, H. (2020). Facktors affecting success of ERP (enterprise resources planning) system implementation. *International Humanities and Science Jour*nal, 3(1), 12–24.

Ghozali, I. (2018). *Aplikasi analisis multivariate dengan program IBM SPSS 25.* Ed. 9. Semarang: Badan Penerbit Universitas Diponegoro.

Gupta, S., Kumar, S., Singh, S. K., Foropon, C., & Chandra, C. (2018). Role of cloud ERP on the performance of an organization. *The International Journal of Logistics Management*, 29(2), 659–675.

Gupta, S., Qian, X., Bhushan, B., & Luo, Z. (2019). Role of cloud ERP and big data on firm performance: a dynamic capability view theory perspective. *Management Decision*, 57(8), 1857–1882.

Gujarati, D. N. (2020). *Basic Econometrics*.International Edition.New York McGrawHill.

Kim, S. (2020). ICT implementation and its effect on public organizations: The case of digital customs and risk management in Korea. *Sustainability*, 12(3421), 1–19.

Madapusi, A. & D'Souza, D. (2012). The influence of ERP system implementation on the operational performance of an organization. *International Journal of Information Management*, *32*(1), 24–34.

Maditinos, D. (2012). Factors affecting ERP system implementation effectiveness. *Journal of Enterprise Information Management*, 25(1), 60–78.

Meijer, P., Ketsiama, R., & Gunawan, H. (2017). Pengaruh penerapan enterprise resource planning terhadap kinerja perusahaan manufaktur dengan firm size sebagai variabel moderasi. *Journal of Applied Managerial Accounting*, *1*(2), 126-139.

Muscatello, J. R., Small, M. H., & Chen, I. J. (2003). Implementing enterprise resource planning (ERP) systems in small and midsize manufacturing firms. *International Journal of Operations & Production Management*, 23(8), 850–871.

Morris, J. J. (2011). The impact of enterprise resource planning (ERP) systems on the effectiveness of internal controls over financial reporting. *Journal of Information Systems*, 25(1), 129–157.

Nawawi, M. (2018). Dampak implementasi ERP terhadap kapabilitas organisasi dan kinerja perusahaan. *Jurnal Riset Akuntansi Terpadu*, 11(2), 238-253.

Nwankpa, J. K. (2015). Computers in human behavior ERP system usage and benefit: A model of antecedents and outcomes. *Computers in Human Behavior*, 45, 335–344.

Nguyen, Q., Tate, M., Calvert, P. & Aubert, B. (2017). Intellectual Capital, Organizational Learning Capability, and ERP Implementation for Strategic Benefit. *In Proceedings of the 25th European Conference on Information Systems* (ECIS), Guimarães, Portugal.

Nuraini, T., Andrijono, A., Irawaty, D., Umar, J., & Gayatri, D. (2018). Spirituality-focused palliative care to improve Indonesian breast cancer patient comfort. *Indian Journal of Palliative Care*, *24*(2), 196-196.

Olawumi, D. A. & Olusegun, S. A. (2019). Business process re-engineering and profitability in the Nigerian Oil and Gas Industry: The mediating influence of operational performance. *Information Management and Business Review*, 11(3), 13–26.

Park, K. O. (2018). The relationship between bpr strategy and change management for the sustainable implementation of ERP: An information orientation perspective. *Sustainability*, 10(9), 1-17.

Rainer, R.K. & Cegielski, CG. (2013).*Introduction to Information Systems*. 4th edition. John Wiley & Sons, Inc.

Ranjan, S., Jha, V. K., & Pal, P. (2017). Application of emerging technologies in ERP implementation in Indian manufacturing enterprises: an exploratory analysis of strategic benefits. *The International Journal of Advanced Manufacturing Technology*, 88(1), 369–380.

Rehman, S., Mohamed, R., & Ayoup, H. (2019). The mediating role of organizational capabilities between organizational performance and its determinants. *Journal of Global Entrepreneurship Research*, 9(1), 1-23.

Ringim, K. J., Razalli, M. R., & Hasnan, N. (2012). Moderating effect of Information technology (IT) capability on the relationship between

business process reengineering factors and organizational performance of Bank. *African Journal of Business Management*, 6(16), 5551–5567.

Saleh, T. & Thoumy, M. (2018). The impact of ERP systems on organizational performance: In Lebanese wholesale engineering companies. *7th International Conference on Industrial Technology and Management* (ICITM), 198–204.

Schlichter, J., Klyver, K., & Haug, A. (2020). The moderating effect of ERP system complexity on the growth–profitability relationship in young SMEs. *Journal of Small Business Management*, 59(2), 1–26.

Syida, N., Suhaimia, A., & Nawawia, A. (2016). Impact of enterprise resource planning on management control system and accountants' role. *International Journal of Economics and Management*, 10(1), 93–108.

Tarigan, Z. J. H., Suprapto, W., & Basana, S. R. (2019). The effect of procedure change, {TQM} and {ERP} implementation to company performance on manufacturing industries. *{IOP} Conference Series: Materials Science and Engineering*, 473, 12052.

Trigo, A., Belfo, F., & Estébanez, R. P. (2014). Accounting Information Systems: The Challenge of the RealT ime Reporting. *Procedia Technology*, 16(2), 118–127.

Wicaksono, A., Mulyo, H. H., & Riantono, I. E. (2015). Analisis dampak sistem penerapan erp terhadap kinerja pengguna. *Binus Bussines Review*, 6(1), 25–34.

Wieder, B., Booth, P., Matolcsy, Z. P., & Ossimitz, M. L. (2006). The impact of ERP systems on firm and business process performance. *Management*, *19*(1), 13-29.

Yu, Y., Li, M., Li, X., Zhao, J. L., & Zhao, D. (2018). Effects of entrepreneurship and IT fashion on SMEs' transformation toward cloud service through mediation of trust. *Information & Management*, 55(2), 245–257.

Yulizar, I. & Govindaraju, R. (2017). Analisis Faktor Pendorong Realisasi Manfaat Implementasi ERP Di Perusahaan Indonesia. *Jurnal Teknik Industri*, 12(1), 7–14.