Enhancing ERP Usage Through Absorptive Capacity: A Case Study from Indonesia Enterprise

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Abstract

Abstract—This research investigates the effect of individual users' absorptive capacity on Enterprise Resource Planning (ERP) usage at PT ABC, a transportation company in Indonesia. The current study used Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine the connections between three aspects of absorptive ability and ERP usage. This study revealed that among aspects of absorptive capacity, only the capacity associated with applying ERP knowledge directly affects ERP usage. Meanwhile, prior understanding and proficiency in integrating ERP systems have a significant indirect impact on ERP usage performance. Based on these theoretical findings, it is suggested that PT ABC strengthens individual employees' absorptive capacities and encourages them to acquire ERP expertise before implementation. Moreover, cultivating a culture that supports collaboration and knowledge sharing is crucial for maximizing the benefits of ERP systems within the organization. Implementing these strategies is expected to improve ERP adoption outcomes at PT ABC.

Keywords: ERP, Absorptive Capacity, ERP Usage, PLS-SEM

Introduction

PT ABC, a reputable organization operating in Indonesia's transportation management industry, has been leading the way in embracing state-of-the-art solutions to improve the quality of its services, which include cargo handling, vehicle management, traffic intelligence, and real-time vehicle movement. The organization has implemented enterprise resource planning (ERP) systems across key departments, particularly Finance, Human Resources, Commerce, and Operations. This strategic move has significantly bolstered its daily business operations, demonstrating PT ABC's commitment to technological advancement and operational efficiency.

In its journey to fully harness the capabilities of the ERP systems, PT ABC has navigated various challenges following the implementation period. An internal audit conducted in the last financial year

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highlighted some areas of improvement, such as change management oversight, consistent documentation, and the need for dedicated roles to modify the system. Recognizing the importance of employee engagement in leveraging technology, the company has conducted multiple workshops and training sessions, complemented by establishing a comprehensive company-wide policy to integrate ERP into day-to-day operations.

Numerous businesses and organizations encounter the same hurdles PT ABC encountered during the ERP post-implementation period. According to a recent poll, the most challenging aspect of ERP for 33.3% of organizations is organizational change, which involves individuals within the company (Chang, 2024). This influences the management perspective since 4 of 5 IT Directors reported dissatisfaction with their ERP Project (Chang, 2024) This research utilizes the concept of absorptive capacity to advance in this specific field. Absorptive capacity refers to the individual ability to understand, assimilate, and exploit external knowledge (Haryanti & Subriadi, 2021).

Research has demonstrated that absorptive capacity positively impacts project success (Mata et al., 2023; Ramadhan et al., 2024). Mata et al. find that absorptive capacity, directly and indirectly, affects project success (Mata et al., 2023). The research conducted by Ramadhan et al. in 2024 underscores the critical role of absorptive capacity in enhancing project success, especially in environments marked by high complexity (Ramadhan et al., 2024). A study also demonstrates that preventing ERP project failure can be achieved by looking at the individual absorptive capacity that facilitates the organizational knowledge process and results in positive organizational capability development (Sharma et al., 2012). Absorptive capacity has also been proven to significantly relate to ERP implementation and assimilation (Saraf et al., 2013). Research on organizations that have adopted ERP systems reveal that assimilation, application, and transfer of information (which are important aspects of individual absorptive capacity) have beneficial impact on ERP usage performance (Park et al., 2007; Wang et al., 2007). The ERP usage model is based on the DeLone and McLean Model, because this model establishes a cause-and-effect relationship between individual and organizational impact (Zhang et al., 2005). It demonstrates how information affects the behavior of individuals and ultimately impacts organizational performance, aligning with the goal of PT ABC.

Identifying three parts of individual absorptive capacity in PT ABC is critical because the management team is now focused on identifying individual elements that affect the usage of ERP in business activities. Most importantly, ERP systems do not transfer the work and skills of information sources to knowledge consumers, making direct interactions with knowledge users almost impossible (Nandi & Vakkayil, 2018). This strategy is anticipated to greatly enhance the development of a more effective ERP adoption strategy, thereby improving productivity and efficiency

With the above information, this paper examines the correlation between individual user absorptive capacity and ERP usage performance at PT ABC. Moreover, no research has examined how individual absorptive capacity affects ERP adoption within Indonesia's transportation sector. This study looks at three parts of an individual's absorptive capacity: their existing knowledge of ERP systems, their proficiency in integrating new ERP information into their work, and their application of ERP information during their job performance (Park et al., 2007). This research will assist PT ABC in developing a more comprehensive approach to improve the adoption of ERP.

This study also has potential for a greater impact due to projected robust growth of ERP business in Indonesia over the upcoming years. The ERP market is projected to grow at a compound annual growth rate (CAGR) of 7.88%, generating revenue of US$118.10 million by 2028 (Statista, 2024). The forecasted data also indicates a 25% increase in per capita ERP software expenditure by 2028 compared to 2024 (Statista, 2024). This underscores the growing significance and adoption of ERP solutions in Indonesia

Literature Review

The ERP system unifies various fundamental processes in an organization by linking data and process flow, providing functionality, features, and capabilities (Nandi & Vakkayil, 2018). The adoption and implementation of ERP enhance company performance by centralizing data and information flow

across diverse functional areas and facilitating open innovation within an organization (Uddin et al., 2020).

It should be recognized that the performance of an ERP system is not primarily defined by early success. Organizations can anticipate long-term improvement in the post-implementation phase by consistently focusing on process enhancement, system integration, and system development (Hasan et al., 2019; Zhu et al., 2010). The performance of an ERP systems initiative is ultimately determined by post-implementation success, which primarily results from the advantage that organizations can gain from ERP deployment (Zhu et al., 2010). These determinants comprise support from top management, a proficient team, end-user education, and ongoing system development. These studies also yield several practical suggestions, including considering conflict of interest, modifying the system, and establishing change management initiatives (Hasan et al., 2019; Hsu et al., 2015; Zhu et al., 2010).

Absorptive Capacity

Absorptive capacity is generally characterized by human competencies, such as individual capability, motivation, knowledge exchange, and assistive capacity (Nandi & Vakkayil, 2018). Cohen defines absorptive capacity as an organization's capacity to recognize, incorporate, and effectively utilize knowledge from its external environment. (Cohen & Levinthal, 1990). The research also suggests that the firm's absorptive capacity is influenced by its members (Haryanti & Subriadi, 2021). Since introducing this new conceptual framework, the notion of absorptive capacity has undergone modifications, including how absorptive capacity plays a crucial role in helping firms develop and maintain competitive advantages through innovative uses of information technology. Boynton et al. state that absorptive capacity in the organization serves as a conceptual framework for the organization's IS understanding (Boynton et al., 1994).

Within the domain of ERP systems, individual absorptive capacity is categorized into three interconnected components (Park et al., 2007). The first aspect is understanding ERP systems. The degree to which the participants had prior knowledge about the objects (Cohen & Levinthal, 1990). This component involves understanding the user regarding ERP systems and consultancy companies (Park et al., 2007). The second element is the user's capacity to integrate newly learned knowledge from ERP technology into their work environment. This second component is called assimilating ERP systems. Upon grasping new knowledge, organizational members must assimilate it, which may be influenced by their comfort level with the associated technology. The final element, applying ERP systems, is the application of ERP knowledge to use on the job. Similar to problem-solving abilities, this is related to the ability of the users to enhance their work based on knowledge derived from ERP and teach that knowledge of ERP to others (Park et al., 2007).

Performance of ERP Usage

ERP system usage pertains to how users utilize the system's capabilities to complete tasks (Hallikainen & Seethamraju, 2015). System utilization is a crucial indicator of the effectiveness of information systems deployment. Therefore, for intricate systems like ERP, usage behavior must be in-depth and advanced for organizations to recognize the inherent advantages (Hallikainen & Seethamraju, 2015). In general, the more end users utilize the system, the higher the chances of the organization achieving its goals and objectives for implementing ERP.

The performance of ERP usage implies how individuals effectively utilize ERP systems to increase productivity and accomplish organizational goals (Chang et al., 2011). This can be quantified through metrics such as user satisfaction, effectiveness, and efficiency (Chang et al., 2011). Previous research has demonstrated that the advantages of ERP implementation are not exclusively contingent upon the technology itself but also depend on the organization's ability to integrate and capitalize on knowledge throughout the organization (Park et al., 2007; Sharma et al., 2012; Wang et al., 2007)

PLS-SEM

Partial least squares structural equation modeling (PLS-SEM) is employed as a statistical technique to quantify the relationships among multiple variables within a structural equation framework (Hair et al., 2017b). The PLS-SEM approach allows researchers to estimate intricate models that encompass many constructs, indicator variables, and structural paths, without requiring any assumptions about the distribution of the data (Hair et al., 2019). Constructs or latent variables are abstract notions that are unable to be observed immediately or measured (Hair et al., 2017b; Hair et al., 2019). These constructs embody conceptual aspects that researchers want to investigate. Indicator variables, often referred to as observed variables or items, are the specific data points gathered by surveys, observations, or other data collection techniques (Hair et al., 2017b; Hair et al., 2019). These variables are utilized to quantify the underlying constructions within the PLS-SEM framework. PLS-SEM is widely used by numerous studies employing this to identify causal links between several constructs with *various* indicators (Hair et al., 2017a; Hair et al., 2017b; Hair et al., 2019). Modelling in PLS-SEM can be classified as either reflective or formative, depending on the direction of causality between the construct and its indicators (Hair et al., 2017a; Hair et al., 2017b). Reflective constructions hold that the construct impacts its indicators, indicating that the indicators are expressions of the construct and should show a correlation (Hair et al., 2019). Formative constructions are created by their indicators, where each indicator contributes to the construct (Hair et al., 2019).

PLS-SEM is also suitable for doing research with a limited population and restricted sample size (Hair et al., 2019; Hair et al., 2017a). Many publications also use the PLS-SEM Model structural modeling approach for small-size samples (N < 100) (Hair et al., 2017b). Moreover, the availability of user-friendly software programs, such as PLS-Graph and SmartPLS, considerably improves the accessibility of PLS-SEM for researchers from various fields of study (Hair et al., 2019; Mayeh et al., 2016).

Research Methodology

Research Model

Figure 1 illustrates the framework utilized in this investigation., which examines the correlation between individuals perceived absorptive capacity and ERP usage in Korean firms (Park et al., 2007). The model observes how the three individual absorptive capacity components interact and correlate with ERP usage performance.

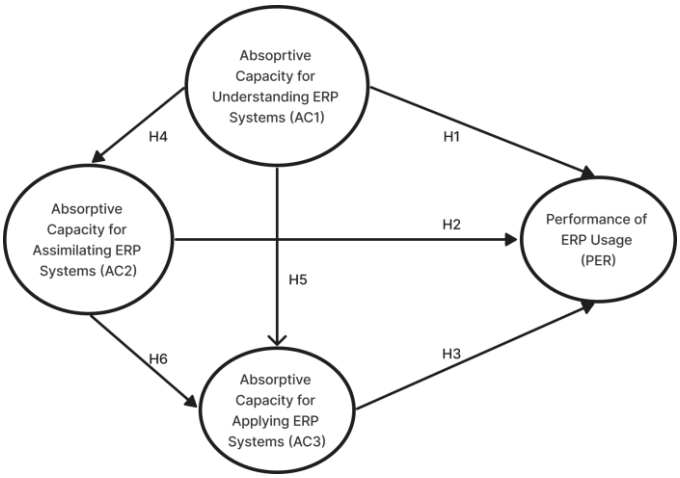

Figure 1. Research Model

Figure 1 presents the research model, which includes three constructs related to absorptive capacity and one construct concerning ERP usage performance. Each of these constructs will be quantified using second-level variables known as indicators. Table 1 summarizes these constructs, along with their corresponding indicators and definitions. Subsequent sections of the document will delve into the details

of three facets of individual absorptive capacity along with its impact on ERP usage performance, as investigated in this study.

Table 1. Summary of Absorptive Capacity Constructs and Indicators

Constructs	Indicators	Definition
AC1	CONK1, CONK2, CONK3, CONK4, PRK1, PRK2,	This construct refers to the ability to comprehend and assimilate knowledge relevant to ERP, measured through six indicators. These include general (PRK1) as well as specific knowledge (PRK2) on ERP systems, awareness of the consulting firm's reputation (CONK1), knowledge of individual ERP consultant (CONK2), familiarity with ERP consultants' professional achievements (CONK3), and understanding of the after-sales service (CONK4).
AC2	EFF1, EFF2, EFF3, EFF4, EFF5, EFF6, EFF7	This construct evaluates an individual's ability to integrate ERP system knowledge effectively. The first four indicators (EFF 1, 2, 3, 4) assess confidence levels related to the practical usage of ERP systems. Additional indicators (EFF 5, 6, 7) focus on specific computer software competencies which are confidence in self-competency, ability to complete tasks, and self-judgment on proficiency with the systems.
AC3	ACAP1, ACAP2, SCAP1, SCAP2, SCAP3	The third component of absorptive capacity is measured using six indicators that assess the utilization and dissemination of ERP knowledge. ACAP1 and ACAP2 focus on the ability to apply ERP knowledge across various job roles and adapt these processes. The subsequent indicators, SCAP1, SCAP2, and SCAP3, evaluate the capacity to teach ERP usage to other colleagues.
PER	PER1, PER2, PER3, PER4, PER5	The construct of ERP usage performance based on previous study that explores the relationship between absorptive capacity and individual performance. These measures assess several aspects of ERP's impact on work performance including job performance improvement, enhancements in job productivity, increases in task speed, ask completion, and overall user satisfaction with the ERP system.

Constructs and Indicators of Absorptive Capacity

The three absorptive capacity constructs used in this study are based on prior academic work, ensuring they have been empirically tested to explore the correlation between absorptive capacity and ERP usage performance (Park et al., 2007).

The first absorptive capacity construct, which measures comprehension of ERP Systems (AC1), is quantified using six indicators. The initial measurement focuses on general knowledge (PRK1), whereas the subsequent measurement assesses knowledge (PRK2) related to ERP systems (Cohen & Levinthal, 1990; Park et al., 2007). Because prior knowledge was also deemed a crucial element, The questionnaire includes four questions about the respondents' pre-existing perceptions of ERP consulting firms and individual consultants (Park et al., 2007; Parry & Graves, 2008). Initially, it queries respondents about their awareness of the overall reputation of the ERP consulting firm before it started collaborating with their organization (CONK1). Secondly, the questionnaire explores the prior knowledge concerning the reputation of individual ERP consultants from the vendor before their involvement in ERP projects within the respondent's organization (CONK2). Furthermore, it delves into the respondents' familiarity with professional accomplishments of ERP consultants before they undertook an ERP project for the organization (CONK3). Lastly, it examines the pre-adoption awareness of the after-sales service offered by the ERP consulting firm (CONK4).

Evaluating the second absorptive capacity (AC2) component involves seven indicators (Park et al., 2007). These indicators are based on self-efficacy, which indicates individual judgment on his or her ability to perform given actions (Park et al., 2007; Schunk, 1991). Self-efficacy, which requires

individuals to monitor their performance and assess their progress, is crucial as those who believe in their capabilities generally perform better than those who doubt themselves (Compeau & Higgins, 1995; Park et al., 2007; Schunk, 1991). Four items (EFF 1, 2, 3, 4) were chosen, and these items are based on the level of confidence in individuals to use computers (Park et al., 2007). The first item (EFF1) evaluates the effectiveness perceived by users when they have access to manual, the second item (EFF2) measures confidence in problem-solving when getting support from others, the third item (EFF3) evaluates help needed in starting the system, and the fourth item (EFF4) explores respondent confidence related to available time to learn the ERP system. Meanwhile, three additional items (EFF 5, 6, 7) were designed to assess individual ability to successfully perform tasks related to developing computer software competencies (Gist et al., 1989; Park et al., 2007). The fifth item (EFF5) measures individual confidence in qualification to use ERP, the sixth item (EFF6) measures each individual confidence related to the capability to complete tasks using ERP, and the seventh item (EFF7) measures individual judgment on ERP understanding and proficiency.

This study also incorporates five additional indicators to assess the third component of absorptive capacity, namely applying ERP Systems (AC3) (Park et al., 2007). These are split into two categories: applying ERP knowledge and skills in broader job contexts and disseminating this knowledge within and outside the organization (Park et al., 2007). The first two items, ACAP1 and ACAP2 assess the individual's ability to transfer the knowledge and processes learned from ERP systems to other job roles. ACAP1 focuses on applying ERP-derived knowledge to different job scenarios, while ACAP2 evaluates the adaptability of knowledge of ERP processes in work contexts. The remaining three items, SCAP1, SCAP2, and SCAP3, explore the participants' capability to teach ERP usage to others. SCAP1 assesses the ability to instruct colleagues within the same department, reflecting intra-departmental knowledge sharing. SCAP2 extends this to inter-departmental training, thereby examining the flow of ERP knowledge across different organizational units. Lastly, SCAP3 evaluates the capacity to teach ERP systems to users from different companies, providing insights into the external dissemination of ERP expertise.

Constructs and Indicators of Performance of ERP Usage

The indicators for measuring ERP performance are derived from Park's questionnaire to measure the association between absorptive ability and individual user performance in South Korean organizations (Park et al., 2007). The criteria used to assess ERP performance are developed using DeLone and McLean's Information Systems success model, complemented by additional insights from ERP literature (Zhang et al., 2005). However, the questionnaire relies only on individual impact and user satisfaction from the DeLone and McLean model as metrics to evaluate ERP usage performance, as this study focuses on measuring individual impact. The indicators are the degree of improvement in job performance (PER1), enhancement of job productivity (PER2), increase in task speed (PER3), and facilitation of task completion (PER4). Meanwhile, the fifth degree (PER 5) focuses on the overall satisfaction of ERP systems.

Hypothesis

Previous studies have written about the positive and substantial correlation between performance using ERP systems and stages of absorptive capacity (Kwahk et al., 2020; Park et al., 2007; Saraf et al., 2013). Therefore, the actions that individuals take based on their ability to understand and apply ERP systems, such as sharing knowledge about ERP systems, developing expertise through knowledge sharing, and effectively using this expertise in their job tasks, can positively impact the utilization performance of ERP systems by advocating ERP system usage in a practical and beneficial manner (Kwahk et al., 2020). These prior research findings have led to formulating research hypotheses that describe correlations between ERP usage performance and three elements of individual absorptive capacity.

The first hypothesis is derived from prior research that demonstrated that existing knowledge positively impacts the acceptance and implementation of new technology (Park et al., 2007). Moreover, the past knowledge of organization members was significantly correlated with their comprehension of novel

and pertinent information (Park et al., 2007). Hence, the first hypothesis posits that their preexisting knowledge or comprehension of ERP systems facilitates individuals' work performance.

- Hypothesis 1: PT ABC employees' ability to understand ERP systems positively influences their performance in using ERP.

In the context of assimilating large-scale ERP systems, the concept of absorptive capacity encompasses all related processes, excluding transformation (Nandi & Vakkayil, 2018). Furthermore, the process of effective assimilation could culminate in users improving their task performance by combining their existing knowledge with newly acquired skills (Park et al., 2007). Prior studies on information systems have also highlighted the significance of the assimilation phase in enhancing system utilization (Park et al., 2007). This statement presents the second hypothesis of the study.

- Hypothesis 2: PT ABC employees' ability to assimilate ERP systems on their task positively influences their performance in using ERP.

The user's absorptive ability not only enhances existing capabilities but also applying the development of new ones (Park et al., 2007). This is accomplished by efficiently incorporating recently acquired knowledge into daily work, allowing people in the organization to establish new habits and carry out duties more effectively with this knowledge (Lee et al., 2018; Park et al., 2007). Hence, overall ability to apply knowledge can leads to improvement of ERP usage. Consequently, the third hypothesis is presented below.

- Hypothesis 3: PT ABC employees' ability to apply knowledge of ERP positively influences their performance in using ERP.

Suh & Yang's publication also shows that applying ERP Systems absorptive systems comprehension is necessary before each user internalizes the ERP knowledge into his or her task and applies the knowledge of ERP systems (Park et al., 2007). This is consistent with the organizational citizenship behavior (OCB) concept, which states that individual behavior not immediately acknowledged by the formal system often leads to organizational learning (Haryanti & Subriadi, 2021). In addition, the significance of existing knowledge is crucial for the process of assimilation, and this emphasis is clearly observed in IT assimilations in general (Nandi & Vakkayil, 2018). To be more precise, broader application and assimilation can be achieved by adopting best practices from previous experience (Nandi & Vakkayil, 2018). Consequently, the fourth hypothesis arises in this study.

- Hypothesis 4: PT ABC employees' ability to understand ERP systems positively affects their ability to assimilate ERP systems to their tasks.

According to Park et al. (2007), Zahra and George's hypothesis on absorptive capacity states that the acquisition and absorption of knowledge, referred to as 'potential' absorptive capacity, has a beneficial impact on the ability to effectively use this knowledge, known as 'realized' absorptive capacity. Undoubtedly, the process of learning knowledge inherently requires a methodical approach to effectively apply and assimilate new information (Kwahk et al., 2020). Consequently, the fifth and sixth hypotheses of this investigation are derived.

- Hypothesis 5: PT ABC employees' ability to understand ERP systems positively affects their ability to apply ERP systems to their tasks.
- Hypothesis 6: PT ABC employees' ability to assimilate ERP systems positively affects their ability to apply ERP systems to their tasks.

Data Collection

The survey was circulated among employees of the transportation company being studied. The target participants are employees who use ERP modules in their regular jobs, regardless of their professional level or department/division. The ERP modules are financial & controlling, human resources, commerce aero, commerce non-aero, and operation. This questionnaire was sent over two weeks in April 2024, and 25 respondents filled it out. The reliability and validity of this collected data will be assessed through multiple criteria in PLS-SEM, such as reflective indicator loading, AVE, HTMT,

multicollinearity, and R^2. These rigorous assessments ensure the findings are reliable and accurately reflect the underlying theoretical constructs despite the smaller sample size.

Measurement

This research project employed a closed questionnaire to evaluate hypotheses and address the research model. This study's questionnaire utilized a scale consisting of seven Likert points and adopted the instrument previously used in another study (Park et al., 2007). The researchers employed a seven-level Likert scale to score the indicator variable items, with 1 representing "completely disagree" and 7 representing "absolutely agree" study (Kwahk et al., 2020; Park et al., 2007; Xie et al., 2018).

Result

This investigation was evaluated using PLS-SEM. This model was employed because of the two levels of variables. The first-level variables consist of three constructs: understanding ERP systems (AC1), assimilating ERP systems (AC2), applying ERP systems (AC3), and performance of ERP usage (PER). Each construct is measured using multiple second-level variables, the observable indicators explained in the previous chapter. This setup dictates causality runs from the construct to its indicators because the constructs are viewed as causing the indicator variables (Hair et al., 2019). This relationship exemplifies the reflective measurement model. The analysis, including tests for reliability, validity, and hypothesis evaluation, was conducted using SmartPLS 4.0.

Evaluating Reflective Measurement Model

Assessing the reflective measurement model in PLS-SEM is foundational to guarantee the dependability and accuracy of the research results (Hair et al., 2017b; Hair et al., 2019). It sets the stage for robust hypothesis testing by ensuring the constructs are well-defined and reliable, thereby enhancing the overall quality and credibility of the research.

The first step in assessing reflective measurement models is to examine indicator loading. The results are displayed in Table 1, where each indicator exhibits loadings above 0.708. This result shows solid and reliable relationships between constructs and their indicators, meaning that an indicator correlates well with the construct it represents and implies a construct' reliable measure (Hair et al., 2019).

The second phase involves evaluating the internal consistency reliability of the indicators to ensure that all indicators measure the same underlying intended construct and thus reflect the same latent variable (Aburumman et al., 2023; Hair et al., 2019). The internal consistency reliability was evaluated by employing Cronbach's alpha and composite reliability (ρ_A and ρ_C) (Hair et al., 2019). Table 2 reports the consistency reliability results across constructs AC1, AC2, AC3, and PER. The findings reveal that Cronbach's alpha for each construct exceeds the 0.7 threshold, suggesting coherence among the indicators intended to measure the same constructs (Aburumman et al., 2023; Hair et al., 2019). Similarly, composite reliability measures, including ρA and ρC, also exceed 0.7 for all constructs, affirming that the constructs are reliable and provide a consistent representation of the theoretical structures they are intended to measure (Aburumman et al., 2023; Hair et al., 2019).

The following step assesses convergent validity using each construct's average variance extracted (AVE) (Hair et al., 2019). Convergent validity refers to the extent to which numerous items accurately measure the same underlying concept and align with each other (Aburumman et al., 2023; Hair et al., 2019). It describes how the measure of a construct captures the amount of variance from its indicators compared to the variance caused by measurement error (Aburumman et al., 2023; Hair et al., 2019). Table 3 displays the outcome of the AVE analysis. All constructs have an AVE value that exceeds 0.50. This suggests that all indicators are good measures of the related construct, supporting the model's convergent validity (Hair et al., 2019).

Table 2. Indicator Loading Test Result

Indicator	Constructs			
	AC1	AC2	AC3	PER
PRK1	0.789			
PRK2	0.841			
CONK1	0.836			
CONK2	0.858			
CONK3	0.895			
CONK4	0.948			
EFF1		0.895		
EFF2		0.835		
EFF3		0.833		
EFF4		0.901		
EFF5		0.923		
EFF6		0.953		
EFF7		0.889		
ACAP1			0.928	
ACAP2			0.872	
SCAP1			0.812	
SCAP2			0.936	
SCAP3			0.806	
PER1				0.827
PER2				0.890
PER3				0.852
PER4				0.934
PER5				0.891

Table 3. Indicator Loading Test Result

Constructs	Cronbach's alpha	Composite reliability (ρ_A)	Composite reliability (ρ_C)	Average variance extracted (AVE)
AC1	0.930	0.940	0.946	0.744
AC2	0.956	0.958	0.964	0.793
AC3	0.921	0.931	0.941	0.761
PER	0.927	0.930	0.945	0.774

When evaluating reflective measurement models in PLS-SEM, the last stage typically involves measuring discriminant validity through the heterotrait-monotrait (HTMT) ratio (Hair et al., 2019). In research using PLS-SEM, Discriminant validity serves to confirm that each construct within the model uniquely captures and represents different theoretical concepts, ensuring they are statistically distinct from each other (Aburumman et al., 2023). According to the results presented in Table 4, the HTMT values of constructs used in this research are less than 0.85. This finding suggests that each construct in

a model reflects a distinct element that independently contributes to the understanding of the components under investigation.

Table 4. Discriminant Validity Test Result

Constructs	AC1	AC2	AC3	PER
AC1				
AC2	0.680			
AC3	0.642	0.834		
PER	0.685	0.780	0.876	

Evaluating Structural Model

Following the successful evaluation of the measurement model, the next phase in evaluating the research is examination of structural model. This assessment examines the relationships between the constructs within the theoretical framework of this study (Hair et al., 2019). The main objective to evaluate the structural model in PLS-SEM is to verify the proposed hypotheses between constructs (Hair et al., 2017b; Hair et al., 2019). The primary assessment parameters that should be considered are the coefficient of determination (R^2) and the statistics of the path coefficient (hypothesis testing) (Hair et al., 2019; Mayeh et al., 2016). However, to avoid any potential distortion of the coefficients between constructs, it is crucial to analyze collinearity by employing variance inflation factors (VIF) (Hair et al., 2019). This preliminary step helps prevent inaccuracies in interpreting the relationships within the model.

Table 5 shows the VIF values for all constructs. All values are close to or below 3, which indicates no significant multicollinearity among the constructs (Hair et al., 2019). Therefore, the structural model analysis may confidently proceed, as each construct provides distinct and significant information to the model without duplicating information from other constructs.

Table 5. VIF Values

Constructs	AC1	AC2	AC3	PER
AC1		1.000	1.714	1.786
AC2			1.714	3.012
AC3				2.762
PER				

The next step is assessing the R^2 value of constructs explained or predicted in the model by other latent variables, called endogenous construct. The endogenous constructs in this research consist of AC2, AC3, and PER. The SMART PLS analysis reveals that the R^2 value for AC2 is 0.417, for AC3 is 0.638, and for PER is 0.712. The R^2 value of AC2 suggests a moderate explanatory power, which means 41,7% of AC2 is influenced by AC1. Meanwhile, the R^2 values of AC3 and PER are 0.638 and 0.712 each, which means the model effectively captures the factors influencing AC3 and PER. It also means that AC1 and AC2 influence 63.8% of AC3, while AC1, AC2, and AC2 influence 71,2% of PER. These show moderate and strong results between constructs and substantially explain dependent constructs (Hair et al., 2019; Mayeh et al., 2016).

After evaluating the VIF and R^2 values, the next step is to examine the path coefficients between constructs to validate the research's hypothesis. The evaluation of path coefficients involves a two-step process (Aburumman et al., 2023). The initial step requires verifying that the p-values are below the conventional threshold of 0.05 (Aburumman et al., 2023). This criterion implies that the effects are statistically significant and unlikely to be attributed to random chance. The second step is the examination of the confidence intervals for these path coefficients (Aburumman et al., 2023). This

means that if the path coefficient's confidence interval excludes the value zero, it indicates significant statistical support for the hypothesized relationship.

Table 6. Result of Hypothesis (Path Coefficient) Testing

Hypothesis	Path	Path Coefficient	P-Value	Confidence Interval		Decision
				Lower Level	Upper Level	
H1	AC1 → PER	0.182	0.334	-0.209	0.538	Not Supported
H2	AC2 → PER	0.172	0.514	-0.437	0.559	Not Supported
H3	AC3 → PER	0.573	0.004	0.164	0.971	Supported
H4	AC1 → AC2	0.646	0.000	0.400	0.798	Supported
H5	AC1 → AC3	0.161	0.400	-0.275	0.468	Not Supported
H6	AC2 → AC3	0.685	0.000	0.337	1.008	Supported

The path coefficient analysis findings are depicted in Figure 2 and Table 6. Figure 2 depicts the path coefficients and their corresponding p-values across different constructs. Meanwhile, Table 6 elaborates on these findings by including confidence intervals and evaluative decisions for each hypothesis in this investigation. The results indicate that Hypothesis 1 is rejected because the p-value of 0.334 is higher than the accepted significance threshold, and the confidence interval includes zero. Similarly, Hypotheses 2 and 5 are unsupported as their p-values also surpassed 0.05, and their confidence interval crosses zero. In contrast, Hypotheses 3, 4, and 6 are supported since each demonstrates p-values below the 0.05 threshold, and the confidence interval range doesn't cross zero. These indicate significant support for hypotheses 3, 4, and 6 within the research model.

Figure 2. PLS Model of Relationships between AC1, AC2, AC3 and PER

This nuanced influence is systematically detailed in Table 7, which provides calculated direct and indirect impacts of all endogenous constructs as analyzed via SmartPLS. Table 7 shows indirect effects can have a more substantial impact than direct effects, specifically on PER. It highlights the importance of considering the broader network of relationships within the model to fully understand the dynamics

of implementing and utilizing ERP systems. Additionally, the confidence interval for each indirect path does not include zero, indicating robust statistical support for these relationships.

Table 7. Total Effects on Endogenous Constructs

Path	Total Effect	Confidence Intervals	
		Lower Level	Upper Level
AC1 → PER	0.639	0.321	0.802
AC2 → PER	0.565	0.337	1.008
AC3 → PER	0.573	0.164	0.971
AC1 → AC2	0.646	0.400	0.798
AC1 → AC3	0.603	0.236	0.763
AC2 → AC3	0.685	0.337	1.008

Discussion

Drawing from a case study on PT ABC, this study examines the correlation between the absorptive capacity of ERP users and their performance in using ERP. It also seeks to enhance comprehension of the dynamics between the absorptive capacity of ERP users and successful ERP adoption. This study's findings also enhance the field of enterprise information systems by adding to the existing literature on ERP and expanding beyond the typically studied areas of planning and implementation phases (Zhu et al., 2010). Even though interest grows in the other phases, notably the operation and enhancement phases (Shaul & Tauber, 2013), Prior publications still focus on success criteria (Esteves & Pastor, 2001; Hasan et al., 2019; Zhu et al., 2010).

Theoretical Implications

This research findings highlight that while the absorptive capacity of the application of ERP systems knowledge (AC3) directly and positively influences ERP performance (PER), the capacities related to understanding (AC1) and assimilating (AC2) ERP systems do not directly impact performance outcomes (PER). Nonetheless, these outcomes should not be seen as contradicting the finding on the influence of absorptive capacity based on previous research, as the indirect influences of these constructs continue to positively affect ERP usage. Notably, Prior comprehension of ERP Systems (AC1) emerges as the most influential construct on PER with a total effect value of 0.639, underscoring its pivotal role in enhancing ERP performance. This indirect influence underscores the importance of initial knowledge acquisition as a precursor to effective application and innovation within ERP systems, corroborating Lee et al.'s assertion that knowledge acquisition is critical before being effectively utilized and integrated into operations to enhance performance (Park et al., 2007). Further analysis also demonstrates the capacity to assimilate ERP systems (AC2) indirectly contributes to performance (PER) by enhancing the application of ERP systems (AC3) with a total effect value of 0.565.

Because AC3, the sole construct directly and positively influencing ERP usage performance, is assessed using six indicators that evaluate the dissemination of ERP knowledge inside and outside the organization. The positive contribution of AC3 highlights that activities focused on knowledge transfer and learning in the organization can effectively enhance ERP systems usage. These outcomes support the research by Lee et al. (Lee et al., 2018), which indicates that organizational coordination capabilities, including participation and cross-functional activities, significantly boost a firm's ability to absorb new capabilities. Furthermore, this result aligns with Jansen et al.'s findings, which suggest that enhancing socialization capabilities—such as socialization tactics and connectedness—can also improve a firm's absorptive capacities (Jansen et al., 2005).

This study provides an in-depth account of the previous research carried out by Kwahk et al. While Kwahk's study focuses solely on the beneficial influence of overall absorptive ability on ERP usage performance (Kwahk et al., 2020), This study demonstrates a clear and indirect positive correlation

between each component of individual absorptive capacity. The findings of this paper also largely support the previous findings of Park et al., which suggest the positive and direct impact of behavior in assimilating and applying ERP systems knowledge to ERP systems usage performance (Park et al., 2007). However, this study offers a nuanced perspective by revealing that applying ERP systems has an indirect beneficial effect on the performance of ERP usage. This research also illustrates favorable direct and indirect correlations between the elements of potential and realized absorptive capacity, examining the interactions between these components through empirical analysis. Potential absorptive capacity refers to the ability to acquire and assimilate knowledge, whereas realized absorptive capacity involves applying, exploiting, or transforming ERP knowledge (Zahra & George, 2002).

The results of this study partially support Mayeh et al.'s (2016) previous findings, indicating a positive and direct influence of absorptive capacity on ERP system usage performance. This study also uncovers indirect relationships between absorptive capacity and ERP usage performance, factors that were not measured in Mayeh et al.'s (2016) study.

Practical Implications

This study offers practical recommendations for PT ABC to refine its ERP adoption strategies. First, PT ABC must influence the behavior of individuals in every facet of absorptive capacity. This approach is critical because the success of an organization and its behavioral dynamics are rooted in the absorptive capacity of individual employees (Park et al., 2007). This also aligns with conceptualization of absorptive capacity, which posits that the capacity of an organization to assimilate and apply external knowledge fundamentally depends on the collective absorptive capacities of its workforce (Cohen & Levinthal, 1990; Nandi & Vakkayil, 2018).

The finding that prior knowledge of ERP is the most significant factor necessitates that PT ABC Management proactively encourages employee participation in developing expertise and obtaining new insights before ERP adoption. This engagement could be facilitated through participation in external workshops and training sessions conducted by third parties, covering critical ERP aspects such as system integration, administration, and development. Essential elements of such a culture include a collaborative environment, mutual trust, and an atmosphere devoid of competition, where individuals are more likely to share knowledge freely, including information directly related to projects (Lee et al., 2018). To nurture this environment, corporate leaders should promote a clan-oriented culture that facilitates the organization's transformation and effective utilization of knowledge (Lee et al., 2018). Additionally, the transfer of expertise could be enhanced by employing seasoned consultants who can aid in understanding and answering pertinent inquiries during the implementation (Aloini et al., 2007). By adopting such strategies, PT ABC will be able to ensure that its workforce is adequately trained and acquire a thorough comprehension of the ERP system before its implementation and subsequent rollout.

The knowledge management for this collaborative behavior can be conducted formally or informally, referred to as codification or personalization strategies (Parry & Graves, 2008; Woods & Cortada, 2013). The codification strategy is predominantly targeted at IT and implementation project teams, while the personalization strategy is aimed at end users (Parry & Graves, 2008; Woods & Cortada, 2013). To codify knowledge, organizations document all processes, lessons learned, and guidance notes at the conclusion of each ERP project and then store these documents in an openly accessible library (Parry & Graves, 2008). The knowledge from the codification strategy is stored in standard repositories used and accessed by the organization. Conversely, the approach of personalization strategy for exchanging tacit knowledge within the organization largely relies on informal knowledge transfer methods and on-the-job training (Parry & Graves, 2008). Knowledge management under the personalization strategy is primarily the responsibility of functional managers, meaning system knowledge tends to be concentrated at the unit or department level rather than being disseminated across the entire organization (Parry & Graves, 2008).

Conclusions

This study sought to assess the impact of three dimensions of workers' absorptive capacity on their proficiency in using ERP systems at PT ABC. The study utilized a theoretical model based on Park et

al (2007) framework and implemented PLS-SEM analysis using SmartPLS software. The findings indicated that out of the three aspects of individual absorptive capacity, only the capacity specifically connected to applying knowledge of ERP systems directly improves performance in using ERP systems. On the other hand, the capacity to understand and assimilate ERP knowledge has a noteworthy indirect influence on the effectiveness of using ERP. This highlights the intricate interaction of various absorptive capabilities in maximizing the utilization of ERP systems.

Based on these insights, PT ABC is recommended to develop strategies to modify individual employee behaviors to maximize their absorptive capacities. This involves actively fostering employee engagement to acquire relevant expertise and insights prior to ERP system adoption. Participation in external workshops and training sessions could serve as an effective method to encourage such involvement. Moreover, promoting behaviors that facilitate the sharing of ERP-related information and fostering collaborative knowledge sharing is essential for enhancing the effective and beneficial use of ERP systems. This research also underscores the importance of cultivating an organizational culture characterized by collaboration, mutual trust, and a non-competitive atmosphere. Such a culture enhances the collective ability to utilize ERP systems effectively, thereby potentially improving overall organizational productivity and efficiency. Implementing these strategic initiatives is anticipated to significantly enhance PT ABC's ERP adoption plan, aligning with the company's broader objectives of improving operational efficiency and productivity.

Limitations

This research provides valuable insights yet is constrained by several limitations. First, the study's relatively small sample size of 25 respondents is modest compared to prior studies employing similar structural models. Despite thorough analyses to validate the sample and instrument, a larger sample would likely strengthen the statistical robustness and validity of the conclusions and hypotheses. Furthermore, the scope of the study, restricted to a single company in Indonesia, may limit the generalizability of the findings. This presents an opportunity for future research to include a more diverse array of organizations across different sectors, enhancing understanding of industry-specific traits and demands within the region.

Additionally, the analysis focuses exclusively on a company that has successfully implemented the SAP program, although ERP solutions encompass a variety of platforms beyond SAP. Future research could include different ERP systems, providing a more comprehensive view of ERP deployment and utilization. Lastly, the study does not explore potential moderating factors impacting ERP adoption outcomes, such as the intention to use ERP and organizational support. Future studies can include new constructs or examine moderating effects. It might reveal significant contrasts and provide deeper insights into ERP usage and implementation dynamics.

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