

Exploring Crucial Factors Affecting the Use of ERP and Their Effect on Employee Performance

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Abstract: - This research identifies key factors that influence the use of Enterprise Resource Planning (ERP) and its influence on employee performance at PT Cakra Jawara Iveco Indonesia. This quantitative research uses Structural Equation Modeling Partial Least Squares (SEM PLS 4) as a data analysis tool to determine the relationship between variables. We propose 9 (nine) hypotheses to examine the relationships between variables, such as technical, organizational, and individual factors that influence ERP adoption. We also offer two. Our respondents are employees from a questionnaire used to gather data on employees' perceptions of the variables. The discovery from this research is that there are internal and external variables to the adoption of information system models that have negligible influence on the adoption and employees' results in self-efficacy at PT Cakra Jawara Iveco Indonesia. Thus, our discovery will provide awareness of what is most necessary for ERP adoption and how it will impact employees. Our findings will be a reference for planning and improvement of strategies concerning the socialization, selection, and implementation of ERP applications, and effective performance of our human resources. Furthermore, we also have two untested hypotheses, and this will provide an opportunity for further inquiry to explore other aspects that might influence ERP adoption and employees' reusability at PT Cakra Jawara Iveco Indonesia.

Key-Words: - ERP Adoption, Business Information System, Employee Performance, Business Organization, Organization Strategic, Human Resource Management.

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1 Introduction

1.1 Background

According to [1], Enterprise Resource Planning (ERP), which stands for an integrated system that helps simplify the business process of an organization with the support of IT, is the best way to enable low-cost human resources since information systems are integrated. Besides, ERP simplifies business processes and enhances organizational functionality. It promotes collaboration and communication among different departments of an organization through the integration of the various aspects of an organization's operations using high-level IT. The integration goes beyond increased business opportunities to give decision-makers real-time data and information when they need it. The organization can respond to changes in the market more easily and make accurate decisions. Furthermore, another advantage is that ERP enhances productivity. The system is designed to optimize workflow and

resource allocation. This optimization helps in improving various performance metrics and facilitating organizational output. Lastly, this information service lowers costs associated with human resources once the integration of the information system is reduced to existing tasks. In other words, adequate employee integration allows a lesser load to be given to them to focus on meaningful activities. ERP services maximize operations to catalyze efficiency, lowering operational costs, and nurture a dynamic environment to promote continuous growth and success.

The pace of the business environment is so high, with technology moving fast and innovations cropping up daily. It implies that change is more and more imperative if all sustainability and excellence in business are terms found in the companies. Organizations that wish to continue generating profit and prosperity for all stakeholders must, in other words, have to be ready for a change. The maintenance of stakeholder profitability and

prosperity in such a dynamic review environment calls for institutions to remain nimble in their friend and emerging challenges. Flexibility must be willing with new technologies and organizational commitment to a learning and innovative culture. These are some of the significant firms who really 'get it' in terms of the critical importance of being ahead of the curve in anticipating shifts in consumer behavior, market 'friends,' and technological landscapes.

In essence, navigating change has become a defining factor for a company's longevity and success. It is not merely about reacting to these changes as they occur but actively seeking opportunities to learn and shape them involving the business landscape by recognizing the inevitability of change and integrating adaptability into their corporate strategies; companies position themselves not just to survive but to excel in a business world that is in a constant state of flux.

The Technology Academy Model (TAM) studies the adoption of technology. TAM was introduced by [1] to research the adoption of human information technology. TAM aims to explain the determinants of technology acceptance, which can indirectly explain the cross-technology usage behavior of end-users, [1]. TAM has been applied to ERP systems to explain complex implementation and adoption problems from organizational stakeholders and end-users, [2]. ERP is closely related to business strategies, organizational capabilities, and performance. ERP implementation and business strategy have been found to impact organizations positively. This positive impact leads to more efficient and effective performance in organizations in achieving organizational business goals and decision-making, [3]. ERP is a large and complex system related to the organization's business processes. This ERP system implementation project differs from other information system implementation projects, [4].

Previous studies have discussed the impact of ERP on organizations. [5], mentions that organizations benefit significantly from ERP implementation. However, the many benefits are comparable to the challenges organizations face implementing ERP. These challenges include limited capabilities in the development and technical implementation of ERP and changes in the organizational structure after ERP is implemented, leading to changes in the organizational structure and responsibilities of employees. However, [6], mention that ERP brings no significant improvement in organizational performance and efficiency for the

industrial sector, focusing specifically on ERP implementation.

One of the suggested changes organizations must make to realize this success is integrating and increasing the efficiency of information systems to produce more efficient business processes. Unfortunately, implementing an information technology system like ERP is not always easy. ERP requires a lot of resources, such as time, human resources, and funds. Many studies have explored the impact of ERP adoption on organizations. Implementing ERP positively impacts workers who use ERP in companies operating in the modern industrial sector, as explained in previous studies discussing ERP adoption. For example, [5], [6], [7], stated the same thing regarding the importance of adopting information systems in enterprise system integration. The variables of self-efficacy, complexity, compatibility, and training are some factors that influence the use of ERP in organizations. Additionally, this study aims to elucidate how ERP post-implementation increases employee performance.

Based on this background above, we formulate the following research problems:

1. Does self-efficacy (X1) influence ERP adoption (Y1)?
2. Does complexity (X2) influence ERP adoption (Y1)?
3. Does compatibility (X3) influence ERP Adoption (Y1)?
4. Does Training (X4) influence employee performance (Y2)?
5. Does Training (X4) influence employee performance (Y2)?
6. Does self-efficacy (X1) influence employee performance (Y2)?
7. Does compatibility (X2) influence employee performance (Y2)?
8. Does complexity (X3) influence employee performance (Y2)?
9. Does ERP adoption (Y1) influence employee performance (Y2)?

1.2 Literature Review

1.2.1 Technology Acceptance Model (TAM)

Organizations can improve their performance if they use new information technology systems efficiently. This Technology Acceptance Model (TAM) approach assesses employee performance. Based on previous research and as a result of changes in this role and handling of developing information systems, a modification of this booming technology adoption model is shown in Figure 1.

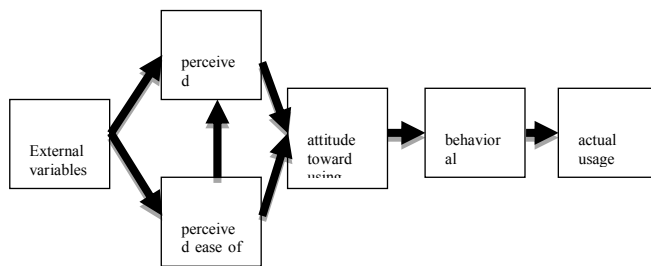


Fig. 1: Technology Acceptance Model (Venkates, 2003)

1.2.2 Enterprise Resource Planning (ERP)

[8], explains that an enterprise resource planning (ERP) system is an extensive software system that integrates several business processes, such as manufacturing, supply chain, sales, finance, human resources, budgeting, and customer service activities. ERP is an integrated computerized information system technology used by world-class companies to improve their performance. ERP has developed as an integration tool to integrate all company business processes or core company activities, which include sales and marketing, maintenance, production and manufacturing, procurement and logistics, warehousing, human resources, finance, and accounting, into a data storage center (server), that all work units can easily access. [9], states that data integration in ERP technology is carried out with a single point of entry, meaning that once one work unit has identified data, this data can be used by other work units that need it without re-entry.

1.2.3 Self Efficacy

Several individual characteristics (self-efficacy) of information systems users have been empirically provided to be related to different levels of information systems users, [10]. Self-efficacy measures a user's confidence in using technology, [11]. It is people's judgments about their ability to organize and execute the actions necessary to achieve a specified type of performance, [12]. In computer and IT use, computer self-efficacy assesses one's ability to use a computer and is an essential antecedent of perceived usefulness, [13]. Individual characteristics have a variable of self-efficacy as the variable being tested.

1.2.4 Training

Training is a critical factor in implementing ERP, [14]. The level of training provided to employees can influence their success in using ERP and employee practices. User training is essential in

determining the success of ERP implementation in an organization. Besides that, user training also has a good impact on the users themselves, as users can become more aware of changes in the company's business processes and work.

1.2.5 Complexity and Compatibility

[15], define technological complexity as the degree to which new technology is more complicated for its users than previous technologies used for the same or similar tasks and represents an increase in the number of things the user must do simultaneously. ERP systems' complex nature limits the knowledge users can absorb before actual usage, [1]. High complexity results in higher mental workload and stress, [16]. The complexity of an ERP system can hurt users' attitudes toward using the system, [17], [18]. The variables tested for the characteristics of the technology are complexity and compatibility.

1.2.6 Employee Performance

Failure to use enterprise Resource Planning (ERP) appropriately within organizations can hinder substantial enhancements in productivity or performance, as highlighted by [19]. The utilization of ERP is intricately tied to the perception that it plays a role in attaining desired performance outcomes, as observed by [20]. According to the insights of [21], the effective implementation of ERP in organizational contexts hinges on aligning ERP capabilities with the specific tasks that users need to accomplish. In employee performance, the variables under scrutiny encompass individual achievements and the overarching empowerment experienced by their workforce. In essence, the successful integration and utilization of ERP involve not only technical considerations but also a nuanced understanding of how ERP functionalities correspond to organizational members' practical needs and goals.

2 Method

2.1 Method

This research was designed to answer the research problems and to test hypotheses using a quantitative approach. This research is explanatory because it attempts to explain the relationship between variables through hypothesis testing. The approach used in this research is quantitative. The analysis method used is the path analysis model with the SEM PLS 4 method as an analysis tool. Our study was implemented at PT Cakra Jawara Iveco

Indonesia. This company was chosen for its adoption of ERP. Thus, our samples were PT Cakra Jawa Indonesia employees who used the ERP application to do their work. Data was analyzed using a Structural equation model to test these hypotheses. SEM analysis consists of three stages: (1) testing the relationship between indicators and latent variables or constructs (outer model or measurement model), (2) testing the relationships between latent/construct variables (structural model), and (3) testing model suitability.

Samples were chosen through purposive sampling so the data collected would suit their research objectives and could be compared to previous studies. Samples selected were those using the information system related to ERP and working in the operational department of a company. [22], mention that the sample size is the number of indicators multiplied by 10. In this study, we had 23 indicators as follows: the self-efficacy variable (X2) consisting of 5 questions, the training variable (X3) consisting of 5 questions, the complexity variable consisting of 4 questions, the ERP usage variable (Y1) consisting of 3 questions, and the employee performance variable (Y2) consisting of 2 questions. Thus, we had 230 respondents (23 indicators multiplied by 10).

2.2 Research Model

Based on the theoretical background, this research tries to build an alternative model to fill the building blocks of research on ERP. The variables examined were the variables described in the literature review. The model we tried to propose is shown in Figure 2, with the TAM model only using the ERP adoption variable as a mediating variable to determine employee performance.

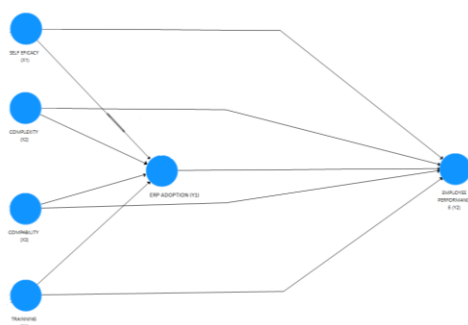


Fig. 2: The Research Concept

Based on the research concept depicted in Figure 2, we proposed 9 hypotheses, as presented in Figure 3.

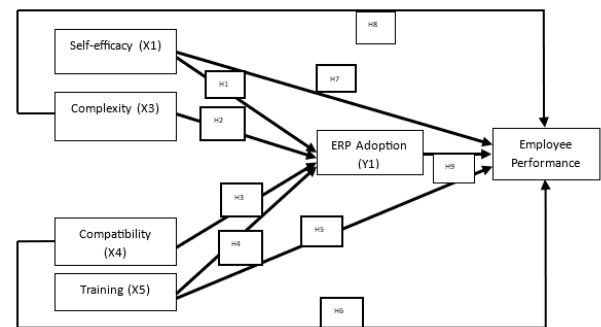


Fig. 3: The Research Hypothesis Framework

3 Problem Solution

3.1 Result

Enterprise Resource Planning (ERP) systems have become integral to modern business operations, streamlining processes, enhancing efficiency, and promoting informed decision-making. This research delves into adopting ERP within the context of PT Cakra Jawa Iveco Indonesia, exploring the challenges, benefits, and impacts associated with implementing ERP in this particular organizational setting. As companies strive to remain competitive in today's dynamic business environment, the strategic adoption of ERP is often considered a crucial factor for sustained success. PT Cakra Jawa Iveco Indonesia's experience with ERP adoption service is a valuable case study, shedding light on the intricacies and implications of integrating such systems into the daily operations of a company. By examining these specific dynamics of ERP adoption in this organization, we aim to contribute insights that can inform the academic discourse on ERP implementation and provide practical guidance for businesses navigating these complexities of technology integration for improved operational outcomes.

3.1.1 Outer Model Test

As depicted in Figure 2 and Figure 3, we have six latent variables or constructs and 22 indicators or questions, elaborated as follows: the self-efficacy variable (X2) consisting of 5 questions, the training variable (X3) consisting of 5 questions, the complexity variable consisting of 4 questions, the ERP usage variable (Y1) consisting of 3 questions, and the employee performance variable (Y2) consisting of 2 questions. Data were analyzed using SmartPLS 4 software. The results of the construct validity and reliability tests are shown in Figure 4 and Figure 5, which are the results of running these outer model tests (measurement model).

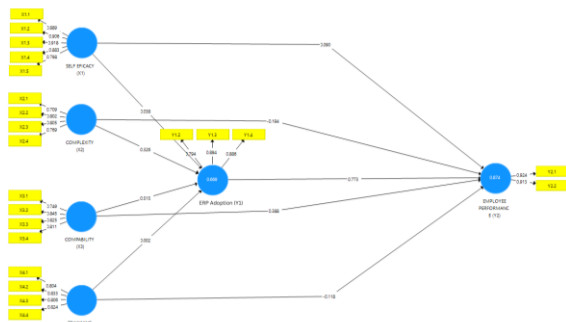


Fig. 4: Outer Model Test

Figure 4 shows the results of the construct validity and reliability test. Questions or indicators that show a loading factor value < 0.7 in the validity test will be removed from this model, [22]. The second running output in Figure 4 shows that all loading factor values are < 0.7 , and we obtain a model containing all indicators with loading factor values > 0.7 . This means that all indicators have been proven valid.

3.1.2 Inner Model Test

Analysis of this relationship between patent variables or constructs in the SEM model tests the structural model in path analysis. In the inner model, the research hypothesis will be proven. In this research, Bootstrapping was used for analysis using SmartPLS 4 software. The Bootstrapping results are presented in Figure 5, followed by the results of several stages of analysis.

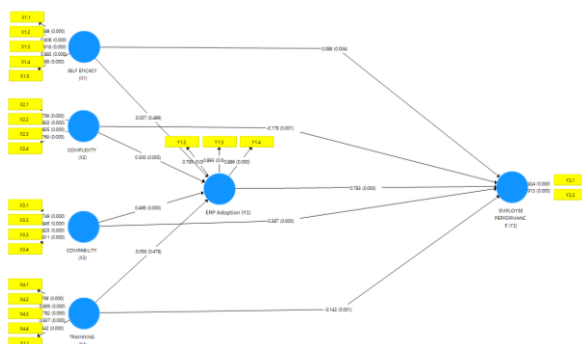


Fig. 5: Inner Model Test

Figure 5 presents the Bootstrapping results to test the inner model, which simultaneously describes the research hypothesis in the SEM model. The results of path analysis, which explain the direct effects of one construct on other constructs, are as follows:

- (1) H1 = Self-efficacy (X1) has a positive and insignificant effect on ERP adoption (Y1) with a path coefficient of $px1y1 = 0.034$ and

p-value = 0.499. So, the first hypothesis is rejected.

- (2) H2 = Complexity (X2) significantly positively affects ERP adoption (Y1) with a path coefficient of $px2y1 = 0.300$ and p-value = 0.005. So, the second hypothesis is accepted.
- (3) H3 = Compatibility (X3) influence ERP adoption (Y1) with a path coefficient of $px3y1 = 0.496$ and p-value = 0.000. So, the third hypothesis is accepted.
- (4) H4 = Training (X4) has a positive and insignificant effect on ERP adoption (Y1) with a path coefficient of $px4y1 = 0.058$ and p-value = 0.478. So, the fourth hypothesis is rejected.
- (5) H5 = Training (x4) negatively and significantly affects employee performance (Y2) with a path coefficient of $px4y2 = -0.142$ and p-value = 0.00. So, the fifth hypothesis is accepted.
- (6) H6 = Compatibility (X3) significantly affects employee performance (Y2) with a path coefficient $px3y2 = 0.387$ and p-value = 0.000. So, the sixth hypothesis is accepted.
- (7) H7 = Self-efficacy (X1) positively affects employee performance (Y2) with a path coefficient $px1y2 = 0.089$ and p-value 0.004. So, the seventh hypothesis is accepted.
- (8) H8 = Complexity (X2) has a negative effect on employee performance (Y2) with a path coefficient ($px2y2$) = -0.178 and p-value = 0.001. So, the eighth hypothesis is accepted.
- (9) H9 = ERP adoption (Y1) positively and significantly affect employee performance (Y2) with a path coefficient $py1y2 = 0.783$ and p-value = 0.000. So, the ninth hypothesis is accepted.

Based on the SEM analysis and interpretation, two hypotheses were rejected, and seven were accepted. Table 1 summarizes those two hypotheses that are not proven because the number of p-values needs to fill more SEM Pls standard.

Table 1. Inner Model Test (p-value)

	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Compatibility (X3) -> Employee Performance (Y2)	0.066	5.859	0.000
Compatibility (X3) -> ERP Adoption (Y1)	0.079	6.264	0.000
Complexity (X2) -> Employee Performance (Y2)	0.053	3.364	0.001
Complexity (X2) -> ERP Adoption (Y1)	0.107	2.814	0.005
ERP Adoption (Y1) -> Employee Performance (Y2)	0.049	16.107	0.000
Self-Efficacy (X1) -> Employee Performance (Y2)	0.031	2.899	0.004
Self-Efficacy (X1) -> ERP Adoption (Y1)	0.054	0.677	0.499
Training (X4) -> Employee Performance (Y2)	0.044	3.231	0.001
Training (X4) -> ERP Adoption (Y1)	0.082	0.710	0.478

3.1.3 Testing Model Fit

Testing model fit can be done in 4 ways, including looking at the coefficient of determination (R-square or R²) and the standardized root mean square residual (SRMR). However, in this study, we used R-square to determine the coefficient of determination (R-square) value. The R² value explains the percentage value of the influence of exogenous and/or endogenous variables on other exogenous variables, and the R² value only exists for exogenous variables. Several exogenous and endogenous variables are said to significantly affect other endogenous variables if they show an R² value > 0.20, [22].

Table 2. The Model Fit (R-Square)

	R-square	Adjusted R-square
Employee Performance	0.875	0.872
ERP Adoption	0.670	0.663

Table 2 shows that the model fits best with the R-square test and shows a significant level of 0.670 or 67% for variable Y1. This means that the influence of exogenous variables (self-efficacy, complexity, compatibility, and training) on the endogenous variable (ERP adoption) is 67%. Next, this model fit test with the R-square test shows a significant level of 0.875 or 87% for variable Y2. This means that the percentage value of the influence of the endogenous variable (ERP adoption) on the endogenous variable (employee

performance) is 0.875 or 87%. Furthermore, to reveal that the resulting PLS model is fit, it can be determined using the Standardized Root Mean Square Residual (SRMR) test.

Table 3. Testing Model Fit (SRMR)

Index Fit	Fit Criteria	Marginal Fit Criteria	Result
Standardized Root Mean Square Residual (SRMR)	≤ 0.08	0.08 – 0.09	0.076

Based on the fit model in Table 3, the Standardized Root Mean Square Residual (SRMR) produces values that comply with the marginal fit criteria. This means that the resulting PLS model is marginally fit.

3.2 Discussion

1. Self-efficacy (X1) insignificantly affects ERP (Y1)

The finding showing that self-efficacy insignificantly affects ERP adoption explains that, empirically, self-efficacy has no influence or impact on ERP adoption at PT Cakra Jawa Iweve Indonesia. This provides that self-efficacy as a measure of user confidence in their ability to use technology, [11], can only sometimes be relied upon when using systems, especially when using ERP. The findings on the influence of the self-efficacy variable were concluded based on the results of the inner model inferential statistical test, which showed that self-efficacy did not affect ERP.

2. Complexity (X2) has a significant effect on ERP Adoption (Y1)

The finding of the influence of the complexity variable (X2) on ERP adoption explains the theory of [15], which defines technological complexity as the extent to which new technology is more complicated for its users than previous technology used for the same or similar work in the ERP system. These findings explain that complexity supports ERP adoption. The findings resulted from inferential statistical processing based on the results of inner model tests. This can be used in similar research on technological characteristics and their influence on using the company's ERP system.

3. Compatibility (X3) has a significant effect on ERP Adoption (Y1)

The compatibility variable (X3) explains other technology characteristics factors, [15], this means that compatibility has an effect that supports ERP adoption. This finding also supports Davenport's [4] claim that ERP is a large and complex system

because it relates to the organization's business processes. The ERP system implementation project differs from other information system implementation projects requiring system compatibility. The findings resulted from the inferential statistical tests at PT Cakra Jawara Iveco Indonesia in the inner model test. These findings explain that technology characteristics can be used in similar corporate information systems or ERP research.

4. Training (X4) has no significant effect on ERP adoption (Y1)

The finding that training has no significant effect on ERP adoption confirms that the level of training given to employees can influence their level of success in ERP adoption and employee performance, [14]. User training is an essential factor in determining the success of implementing ERP in an organization, but empirical findings at PT Cakra Jawara Iveco Indonesia showed that training could only sometimes be applied to some organizational settings. The finding that this training had no effect resulted from an inferential statistical test, namely the inner model test, confirming that ERP adoption needs other factors and theoretical and empirical support.

5. Training (X5) has a significant effect on employee performance (Y2)

This finding confirms that training significantly affects employee performance; it shows that it is a critical factor in improving employee performance. Apart from that, user training also has a good impact on the users themselves, namely that users can become more aware of changes in the company's business processes and work. The finding that training significantly affects employee performance at PT Cakra Jawara Iveco Indonesia resulted from their inner model test on inferential statistics. This finding indicates that training is an essential factor in research related to employee performance.

6. Self-efficacy (X1) has a significant effect on employee performance (Y2)

The findings show that self-efficacy significantly affects employee performance and that individual characteristic factors greatly impact employee performance. Self-efficacy measures a user's confidence in using technology, [11]. It is people's judgments about their ability to organize and execute the actions necessary to achieve a specified type of performance, [12]. So, employees having good characteristics is the key to improving performance. The findings are the results of

inferential statistical tests at PT Cakra Jawara Iveco Indonesia that can be used empirically in similar research.

7. Complexity (X2) has a significant effect on employee performance (Y2)

This finding that complexity significantly affects employee performance proves that complexity significantly impacts employee performance. ERP systems' complex nature limits the knowledge users can absorb before actual usage, [1]. High complexity results in higher mental workload and stress, [16]. The results of this complexity variable test at PT Cakra Jawara Iveco Indonesia prove that technological complexity dramatically influences many aspects of organizational performance. These findings indicate that the complexity variable in technology characteristics can be used in similar research on employee performance.

8. ERP (Y1) has a significant effect on employee performance (Y2)

This finding confirms the significant influence of ERP adoption on employee performance and shows the importance of organizational management systems through ERP to improve employee performance in organizations. [23], explains that an ERP system is an extensive software system that integrates several business processes, such as manufacturing, supply chain, sales, finance, human resources, budgeting, and customer service activities. These results are based on inferential statistical tests at PT Cakra Jawara Iveco Indonesia. These findings indicate that ERP can be used in similar research to assess employee performance and system success.

The above result outlines how critical understanding ERP adoption behavior and the impact of its adoption on the employee is in a research report called "Exploring Crucial Factors Affecting The Use Of ERP And Their Effect On Employee Performance" conducted in PT Cakra Jawara Iveco. In this regard, therefore, the research provides invaluable insights that would help enhance ERP implementation strategies vis-à-vis critical factors influencing these dynamics and, most importantly, optimization of human resource management practices within the organization. However, it is essential to note that comprehensive testing of these two hypotheses was not done, signaling the exploratory possibility of more variables that can shape ERP adoption and employee performance outcomes at PT Cakra

Jawara Iveco Indonesia. This underlines the continued relevance and need for further research in this domain to ensure the development of robust and effective organizational strategies that are tailored to the explicit needs and challenges the company is facing.

4 Conclusion

Self-efficacy does not significantly have a positive effect on ERP adoption but is relatively weak. This indicates that the better individual capacity of an employee will not be directly proportional to ERP adoption. Hence, the first hypothesis is not supported. Organizational support, in the context of technological support, has medium effects on ERP adoption, but it has a positive and substantial impact. This means that better organizational support in technology support will be directly proportional to organizational support of ERP adoption, hence accepting hypothesis two.

Technological complexity has a negative and significant influence on ERP adoption with a strong influence. This indicates that the better and more complex the technology in ERP will negatively impact ERP adoption and increase the workload for employees. So, the fourth hypothesis is accepted.

Technological compatibility has a positive and significant influence on ERP adoption with a strong influence. This indicates that the better the technological compatibility in ERP, the more direct impact it will have on ERP adoption for employees. So, the fifth hypothesis is accepted.

Training has a positive and insignificant influence on employee performance with a medium influence. This indicates that the better the training in the organization is, the less impact it will have on employee performance. So, the sixth hypothesis is rejected.

Self-efficacy positively and significantly influences employee performance with a medium influence. This indicates that the better the employee's self-efficacy or self-capacity, the more direct impact it will have on employee performance. So, the seventh hypothesis is accepted.

ERP adoption has a positive and significant influence on employee performance with a powerful influence. This indicates that ERP adoption will directly impact or influence employee performance. So, the eighth hypothesis is accepted. ERP adoption significantly influences employee performance, meaning that the use of technology will positively impact the organization.

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- Muhammad Al Musadieq managed and oversaw the annotation, scrubbing, and maintenance of research data, including relevant software code, for both immediate and future use. They secured financial backing for the project, which resulted in this publication. Additionally, they lead and supervise research planning and execution, providing mentorship beyond the core team.
- Riyadi Samuri Kartodjo and Teuku Noerman applied statistical, mathematical, computational, or other formal techniques for analyzing or synthesizing study data, designing methodology, drafting initial publication drafts, and providing study materials.
- Ulul Albab, Nurohman Amin Fahrozi Verify the overall replication/reproducibility of results/experiments and other research outputs, including drafting initial publication drafts and critical review or revision by original research group members.

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