The International Journal of Social Sciences World
TIJOSSW is Available Online at:
https://www.growingscholar.org/journal/index.php/TIJOSSW
Vol. 5 No. 2, July-December 2023, pages: 95~108
DOI: https://doi.org/10.5281/zenodo.8202554
ISSN **2690-5167**
Growingscholar Publisher

Analysis of Determining Factors for Implementing Enterprise Resource Planning (ERP) Systems to Achieve Competitive Advantage in Construction Service Companies

Ilham Ramadhan[1], Agung Wahyu Handaru[2], Indra Pahala[3]

Article history:
Received April 30, 2023; Accepted: July 2, 2023; Displayed Online: July 31, 2023; Published: December 30, 2023

Keywords

Competitive advantage;

Implementation determinants;

ERP system implementation;

Construction services;

Abstract

The research objectives are (1) to analyze the effect of top management support project management, Business Process Reengineering, software and hardware, education and training, vendor support, and corporate culture on the success of ERP implementation; and (2) to analyze the effect of top management support, effective project management, business process reengineering, software and hardware, education and training, vendor support, corporate culture, and top management support on the company's competitive advantage. The research results show that top management support for project management, Business Process Reengineering, and corporate culture has a positive and significant effect on the success of ERP implementation. In contrast, software, hardware, and vendor support have no positive or significant effect on the success of ERP implementation.

1. Introduction

Changes in the economy and technology, especially information technology developments, have significantly changed the work environment and business management. PT Brantas Abipraya (Persero), as a State-Owned Enterprise in the field of construction services, has an important role because PT Brantas Abipraya (Persero) is tasked with contributing to the development of the national economy in general and state revenues in particular.

Enterprise Resources Planning (ERP) is an integrated software application package for widespread use in organizations. The Enterprise Resources Planning (ERP) system is a fully

[1] *Universitas Negeri Jakarta, Indonesia. Email: ilhamramadhan1804@gmail.com*
[2] *Universitas Negeri Jakarta, Indonesia*
[3] *Universitas Negeri Jakarta, Indonesia*

integrated system package that supports the automation of all standard business processes within the organization. According to Leon(2008) in Kurniawati and Permadi (2011)ERP system is a technique and concept that is applied to integrate management in the business as a whole through the point of view of the effective use of resource management to increase the efficiency of the company. The purpose of implementing an ERP system is efficiency and transparency so that the process of consolidating data will not cause difficulties in combining information because the existing information has been integrated. ERP systems are important to implement in today's information age, especially for companies that rely on high information technology.

Kumar et al. (2000) describe an ERP system as "an information system package that integrates information-based and information-based processes within and outside the functional area of an organization. The ERP concept is an attempt to control all company resources through integrated data handling with an integrated information system. With complete and integrated data availability, company management can plan resources quickly and accurately. In addition to improving company performance, it is also very influential in decision-making for managers. The ERP information system covers all parts of the company that are structurally and functionally integrated. Structurally, the company's resources are grouped based on a certain hierarchy, for example, the division of divisions, departments, business units, work units, and subsidiaries. Functionally, the company's resources are grouped based on their function within the company, for example, in the procurement department, human resources, finance, accounting, taxation, and others.

Research by Martin et al. (2002) shows that there are several benefits to ERP implementation. Three benefits relate to business matters, two to information technology, and one to business and information technology together. Thus, an organization views Enterprises Resource Planning (ERP) as an important strategic competition tool. ERP plays an important role in today's enterprise management and is the backbone of the organization. While ERP is widely recognized as a useful tool, in practice, there are many difficulties in implementing it effectively. According to Stewart (2000), Although most organizations have their own software systems that perform most of the functions of ERP components, standardized and integrated ERP software environments with operational levels are difficult and expensive to stand alone, according to demand.

The use of information technology at PT Brantas Abipraya (Persero) has two objectives, both corporate value and customer value goals. In order to increase corporate value, PT Brantas Abipraya (Persero), as part of a State-Owned Enterprise (BUMN), is required to increase strong competitiveness, encourage professional, efficient, and effective company management, and apply the cultural principles of AKHLAK, namely Harmonious Competent Trust Loyal Adaptive Collaborative. Meanwhile, from the customer value aspect, PT Brantas Abipraya (Persero) is required to build a company that is strong and able to provide satisfying service to customers, profits, and added value for shareholders,

In accordance with the Official Memorandum of the Main Director of PT. Brantas Abipraya (Persro) number: 26/D/ND/V/2022 dated 17 May 2022 concerning ERP Implementation and E Proc in connection with the company's Go Live Enterprise Resource Planning (ERP) work program in 2022, as well as in an effort to support the company's growth efficiently and reliably in the construction and investment industry. This is also in line with the results of the GMS of PT. Brantas Abipraya (Persero) in 2021, wherein the results of the GMS, one of them approved the entire planned agenda with the direction of ERP system implementation to integrate all business processes to make them more efficient, effective, and optimal.

The company's efforts to manage a project more efficiently, effectively, and optimally align with its vision of becoming a trusted company in the construction and investment industry; its mission is to provide quality construction products in a professional and sustainable manner. The vision and mission were approved by the Board of Directors according to the Decree of the Board of Directors no 76.1/D/KPTS/II/2021. With this mission, the company must be tough, unyielding, and tenacious in maintaining and increasing the company's existence, winning the competition in the construction industry, and providing the best-added value for the company.

Seeing this, the company PT. Brantas Abipraya (Persero) is developing the application of an ERP system for companies. ERP systems can be considered a major development in today's use of information technology. ERP implementation is usually a large, complex project involving a large group of people and other resources, works together under a tight schedule according to a predetermined one, and faces many unexpected developments because it follows the company's business processes. Not surprisingly, many of the implementations have failed more than achieved the expected success(Avnet, 1999; Buckhout et al., 1999; Davenport, 1998)inWinahyu (2005).

ERP system implementation is very expensive, and the price of the software is high, as well as other costs, such as consulting fees, which can be even more expensive. PT. Brantas Abipraya (Persero) spent a fairly large amount of Rp in developing the ERP system. 3,650,000,000, - with PT. Matrica Consulting Service. This value is very large in implementing an ERP system in the company; therefore, with these costs, the company is expected to start using the ERP system application in 2022.

ERP investment is very expensive, and choosing the wrong ERP can be a nightmare for a company. ERP systems can destroy the company that installed them. In a survey conducted by Deloitte on 64 companies listed in the Fortune 500, 25% of the surveyed companies stated that they had experienced a sharp decline in performance in the period after the implementation of Hall and Singleton (2007) in Winarno(2015). Therefore an ERP that is successfully used by one company is not a guarantee of success in other companies. Following are some of the failure factors of ERP implementation according to Barton(2001) in Winarno (2015).

Table 1.
ERP Implementation Failure Factors

ERP Implementation Failure Factors	Explanation
The complexity inherent in ERP implementation	ERP systems are complex, and implementing them can be difficult, time-consuming, and expensive for a company.
External Consultants	Almost all ERP implementations involve outside consultants coordinating projects, identifying company needs, selecting ERP packages, and managing their migration. Complaints that often arise are consulting firms that promise experienced practitioners but send incompetent interns and/or consultants who have a limited understanding of the client's business processes.
Inadequate training	Lack of training is the cause of ERP implementation failure. Not only Education in Engineering staff but also the user community that supports real work with the system.
Corporate Culture	Some ERP projects fail because employees do not realize the need for and benefits of the project. People usually

	tend to maintain a comfort zone; in this case, if they feel comfortable, it will be very difficult to make changes, especially if all operations and procedures are felt to be good enough without the need to use a new system, in this case, ERP.

Source: Processed by the Author

There is a lot of strong evidence that ERP system implementation projects cannot be completed on time and within the existing budget. Shanks et al. (2000) in Vienna (2005) and also fully reported that many ERP implementations have failed, according to Martinsons and Westwood (1997) in Vienna (2005). Meanwhile, if the ERP system is successfully implemented, important benefits such as improved customer service, better production scheduling, and reduced manufacturing costs can be obtained. Even though sometimes the success rate in ERP implementation is low, companies that have succeeded in implementing ERP get many benefits from ERP and have fully utilized the potential of ERP in the organization.

Based on the background of the problems described above and looking at the company PT. Brantas Abipraya (Persero) is implementing the ERP implementation process so that the critical success factors are important in implementing ERP system applications, so this study aims to see how much influence the critical success factors have, especially for the critical success factors that have been identified in several previous studies where the results of research conducted by Mudiantono (2013) shows the results that the six determinants influence the success of ERP implementation and the implementation has an effect on competitive advantage while the results of research conducted by Wijayanto(2020)states that the reflection of organizational culture in ERP implementation is good. Inconsistent results were carried out by Hidayat et al. (2017).

The results show that there is a significant influence between the key factors on the success of ERP implementation, while partially top management support, effective project management, business process engineering, software and hardware selection, and vendor support have no effect. However, education and training factors influence the success of ERP implementation in implementing ERP software applications and see the relationship between the critical success factors in ERP implementation at PT. Brantas Abipraya (Persero) to be able to achieve the company's competitive advantage. The critical success factors taken in this study are seven critical success factors, namely top management support, effective project management, business process reengineering, selection of software (software) and hardware (hardware), education and training, vendor support, and corporate culture. The reason for selecting the seven factors is because, in several previous studies, it was shown that these factors were very dominant in the successful implementation of ERP system applications, so these seven factors were taken into account in ERP implementation at PT. Brantas Abipraya (Persero). so that these seven factors are taken in ERP implementation at PT. Brantas Abipraya (Persero). so that these seven factors are taken in ERP implementation at PT. Brantas Abipraya (Persero).

Based on this, this research was conducted to determine how much influence the critical success factors had in implementing ERP software applications in particular and IT implementation in general at PT. Brantas Abipraya (Persero), as well as to see the relationship between these critical success factors to achieve the company's competitive advantage. So, based on the reviews above, this research will analyze the determinants of implementing Enterprise Resource Planning (ERP) systems to achieve competitive advantage in construction service companies. This research is based on the new

phenomenon of implementing an ERP system carried out by PT. Brantas Abipraya (Persero). So, this research was conducted at PT. Brantas Abipraya (Persero).

2. Material and Method

This research applies quantitative methods using a survey approach. The survey conducted in this study was a survey conducted using a questionnaire. This study intends to find out what factors influence the success of ERP implementation and the influence of the company's competitive advantage on the success of ERP implementation at PT Brantas Abipraya (Persero). This study uses research objects, namely managerial and non-managerial employees who are involved in determining the success factors of ERP implementation and the company's competitive advantage. The successful implementation of ERP is one of the technology systems that has just been implemented by PT Brantas Abipraya (Persero) in Cawang, East Jakarta.

3. Results and Discussion

Discussion of Hypothesis Test Results

Based on the results of the data analysis that has been done, it can be explained the research results from the relationship between research variables. The explanation of the results of this study is as follows;

Testing the Effect of Top Management Support on the Success of ERP Implementation

The calculation results obtained a t-count of 2.33 and a t-table value of 1.96 (t-count > t-table). This means that H01 is rejected and Ha1 is accepted, so top management support has a significant influence on the success of ERP implementation. Thus, the hypothesis, which states that top management support has a significant influence on the success of ERP implementation, is accepted. These results are supported by research conducted by Lestariningsih et al. (2015), who found that top management support has a significant effect on the success of ERP implementation as well as research conducted by Mudiantono and Saddiyah (2015), who found that top management support has a positive effect on the success of ERP implementation.

Several indicators contained in top management support the leadership attitude that I do in the ERP implementation, which is needed in the company. This, of course, has become a consideration for the company because top management support is one of the key success factors for the success of ERP system implementation in the company. With top management support, all employees will focus and have targets in implementing the system. Because this indicator is one of the determining factors for ERP implementation success in companies, companies need to maintain efforts in this regard. Efforts that the company can make to fulfill this is to provide all existing resources in the company, such as human resources**.**

Testing the Effect of Effective Project Management on the Success of ERP Implementation

The calculation results obtained a t-count of 2.48 and a t-table value of 1.96 (t count > t table). This means that if H01 is rejected and Ha1 is accepted, effective project management has a significant influence on the success of ERP implementation. Thus the hypothesis that states that there is an effect of effective project management on the success of ERP implementation is accepted. These results are supported by research conducted by Hidayat et al. (2017) which found that effective project management significantly affects the success of ERP implementation. As well as research conducted by Tjakrawala et al. (2012) found that effective project management significantly affects the success of ERP implementation.

From several indicators contained in effective project management, the company indicator determines a project leader experienced in implementing ERP implementation systems that need to be carried out by companies. This, of course, has become a consideration for the company because the success of ERP implementation cannot be separated from effective project management in simplifying and implementing the ERP system. As effective project management is needed and filled by highly competent human resources in the company, and since this indicator is also a factor in the success of ERP implementation, companies need to maintain efforts in this regard.

Testing the Effect of Business Process Reengineering on the Success of ERP Implementation

The calculation results obtained a t-count of 2.46 and a t-table value of 1.96 (t count> t table). This means that if H01 is rejected and Ha1 is accepted, then there is a significant influence between business process reengineering on the success of ERP implementation. Thus, the hypothesis, which states that business process reengineering influences the success of ERP implementation, is accepted. These results are supported by research conducted by Hidayat et al. (2017), which found business process reengineering had a significant effect on the success of ERP implementation. As well as research conducted by Mudiantono (2015) found business process reengineering had a positive effect on the success of ERP implementation.

From several indicators contained in business process reengineering, company indicators integrate ERP systems with other management information systems that need to be carried out by companies. Of course, this has become a consideration for the company because successful implementation in the company cannot be separated from business process reengineering. Therefore, companies need to do this by integrating existing systems such as e-procurement (procurement), e-hc (HR), e-accounting (finance), and logistics.

Testing the Effect of Software and Hardware on the Success of ERP Implementation

The calculation results obtained a t-count of 1,11 and a t-table value of 1.96 (t count < t table). This means that H01 is accepted and Ha1 is rejected, so there is no significant effect between software and hardware on the success of ERP implementation. Thus, the hypothesis that states that software and hardware influence on the success of ERP implementation can be rejected. These results are supported by research conducted by Akram et al. (2017), who found that the quality of software and hardware information has no significant effect on the success of ERP implementation. This is because the software and hardware used to use the odoo system, while the system used by state-owned enterprises is of the same type, such as PT. PP (Persero) Tbk and PT Wijaya Karya (Persero) Tbk use

SAP. The application of the odoo system used by the company has not made a maximum contribution to implementing the ERP implementation system.

Software and hardware do not affect the success of ERP implementation because the system used by the company, in this case, Odoo, is still not optimal in implementing ERP implementation in terms of integrating all existing systems in the company. There are still many modules contained in the ERP system that have not provided the desired output for the company. The most influential software and hardware indicators for the success of ERP implementation are companies integrating ERP systems with other management information systems in the company. However, this is still in the process of being integrated into all other information systems because software and hardware are the main keys to the success of ERP implementation in companies.

So, to fulfill this, the effort that the company can make is to accelerate the development of the Odoo ERP application system to monitor the implementation of the existing ERP system so that it can produce the expected output in accordance with the company's needs. This effort can be maximized and accelerated by all IT managers, HR managers, department and division finance managers, and SCM managers to increase the expected output results.

Testing the Effect of Education and Training on the Success of ERP Implementation

The calculation results obtained a t-count of 3.81 and a t-table value of 1.96 (t count> t table). This means that H01 is rejected Ha1 is accepted, so there is a significant influence between education and training on the success of ERP implementation. Thus, the hypothesis, which states that education and training influence the success of ERP implementation, is accepted. These results are supported by research conducted by Suwandhi, and Aji (2015), who found education and training had a significant effect on the success of ERP implementation. As well as research conducted by Mudiantono and Sa'diyah (2015) found education and training had a significant effect on the success of ERP implementation.

Of the several indicators contained in education and training, the indicator is that there is direct training related to the use of the ERP system, and the company must select competent teaching staff during the training process. Of course, this has become a consideration for the company because the success of ERP implementation in the company cannot be separated from the education and training provided to all employees. Therefore, it is very important that the company provides training and education directly to all employees with teaching staff who have good competence in providing material and directions on how to implement the existing ERP application system in the company.

Testing the Effect of Vendor Support on the Success of ERP Implementation

The calculation results obtained a t-count of 1.56 and a t-table value of 1.96 (t count < t table). That is, H01 is accepted, and Ha1 is rejected, so there is no significant influence between vendor support on the success of ERP implementation. Thus the hypothesis that states that there is an influence of vendor support on the success of ERP implementation can be rejected. These results are supported by research conducted by Hidayat et al. (2017), who found vendor support has no significant effect on ERP implementation success. This is because the vendor's support for repair handlers complained about by the company is not handled optimally, which makes the success of ERP implementation in the company constrained and not optimal in its application in the company.

Vendor support does not affect the success of ERP implementation because there are not too many vendors' roles, in this case, PT. Matrica Solution in following up complaints from companies in existing ERP applications. The vendor support indicator that has the most influence on the success of ERP implementation is that vendor support continues even after implementing the system in terms of system maintenance and improvement in the company. However, it is difficult to make efforts in terms of maintenance and improvement of the ERP system. Because vendor support is an important factor in the success of ERP implementation to maintain and improve the system so that it is better and perfect for company needs.

So, to fulfill this, the effort that can be made by the company is to request an action plan for vendors to target the resolution of complaints and deficiencies in ERP applications in the company and create vendor work programs to accelerate the improvement of existing ERP applications in the company. This effort can be optimized and programmed by the company's ERP project director, all senior managers, and managers of the company's work units and business units.

Testing the Effect of Organizational Culture on the Success of ERP Implementation

The calculation results obtained a t-count of 2.03 and a t-table value of 1.96 (t count> t table). That is, if H01 is rejected and Ha1 is accepted, then there is a significant influence of organizational culture on the success of ERP implementation. Thus the hypothesis, which states that there is an influence of organizational culture on the success of ERP implementation, is accepted. These results are supported by research conducted by Wijayanto (2020), which found organizational culture to have a significant effect on the success of ERP implementation. As well as research conducted by Gusman (2021) found that corporate culture and environment influence the success of ERP implementation.

From several indicators contained in the organizational culture, the employee indicators are aware of changes and are ready to overcome them that need to be carried out by the company. This, of course, has become a consideration for the company because, in the successful implementation of ERP in the company, all employees are asked to be ready to face change and be ready to overcome it so that the company's human resources can compete in facing an era full of uncertainty and progress in the increasingly rapid technological era in the construction industry. Therefore organizational culture plays an important role in the success of ERP implementation.

Testing the Effect of Top Management Support on Competitive Advantage

The calculation results were obtained by a t-count of 2,11, and the t-table value is 1.96 (t count > t table). This means that if H01 is rejected and Ha1 is accepted, then there is a significant influence of top management support on competitive advantage. Thus the hypothesis that states that there is an influence of top management support on competitive advantage is accepted. These results are supported by research conducted by Adiputra and Mandala (2017), which found good capabilities, such as top management support, have a significant and positive effect on a company's competitive advantage. As well as research conducted by Ismail et al. (2012) states management capability is an important element in company strategy, and company knowledge is one of the vital ingredients in achieving competitive advantage and good company performance.

Of the several indicators contained in top management support, my indicator continuously monitors project progress and provides direction to the implementation that needs to be carried out by the company. This is, of course, a consideration for the company because in achieving competitive advantage, the entire top management must provide full support for the development of technology in the company so that all elements in the company can provide maximum results to increase the company's competitive advantage. Therefore top management support plays an important role in increasing the company's competitive advantage.

Testing the Effect of Effective Project Management on Competitive Advantage

The calculation results obtained a t-count of 2.49 and a t-table value of 1.96 (t-count > t-table). This means that if H01 is rejected and Ha1 is accepted, then there is a significant effect of effective project management on competitive advantage. Thus the hypothesis that states that there is an effect of effective project management on competitive advantage is accepted. These results are supported by research conducted by Adiputra and Mandala (2017) which found that effective project management has a significant effect on competitive advantage.

Of the several indicators contained in effective project management, the indicator has formal planning in ERP implementation that needs to be carried out by the company. This is, of course, a consideration for the company because, in achieving competitive advantage, the company must have effective project management, the company, in this case, has carried out and formed a champion team in terms of realizing all the implementation of existing technology systems in the company, so that it can provide a competitive advantage for companies that Good. It can be seen that the company has selected an effective project management team, and it can be seen that PT Brantas Abipraya has issued an official note no. 43/D/ND/IX/2022 dated 08 September 2022 Regarding the ERP Division (Project Support) team and the project ERP implementation team.

Testing the Effect of Business Process Reengineering on Competitive Advantage

The calculation results obtained a t-count of 2.31 and a t-table value of 1.96 (t count> t table). This means that if H01 is rejected and Ha1 is accepted, then there is a significant influence of business process reengineering on competitive advantage. Thus the hypothesis that states that there is an effect of business process reengineering on competitive advantage is accepted. These results are supported by research conducted by Masaba et al. (2015), which found adaptations to the business environment and competitive strategies capable of driving competitive advantage strategies to improve business performance, as well as research conducted by Septiani and Devie (2013), who found business process reengineering to have a positive and significant influence on competitive advantage.

From several indicators contained in business process reengineering, company indicators ensure data resilience (no data loss) between business processes that companies need to do. This is, of course, a consideration for the company because, in achieving competitive advantage, the company must have business process reengineering, PT Brantas Abipraya (Persero), in this case, has purchased data servers in data storage to support business process data storage and technological developments carried out by the company. , the company also created a special server room in terms of data storage to ensure the quality of the company's data storage.

Testing the Effect of Software and Hardware on Competitive Advantage

The calculation results obtained a t-count of 3.04 and a t-table value of 1.96 (t count > t table). This means that if H01 is rejected and Ha1 is accepted, then there is a significant influence of software and hardware on competitive advantage. Thus the hypothesis which states that there is an influence of software and hardware on competitive advantage is accepted. These results are supported by research conducted by Rahmasari (2018), which found the application of information technology has a positive and significant effect on competitive advantage. As well as research conducted by Cakmak and Tas (2012) found good and adequate information technology would certainly be useful in building a company's competitive advantage.

From several indicators contained in software and hardware, an indicator of the suitability of choosing software and hardware with the company's needs in ERP implementation needs to be done by the company. This is, of course, a consideration for the company because in order to achieve a competitive advantage, a company must have good information system technology. PT Brantas Abipraya (Persero) sees that the need for technology today is very much needed. Therefore, the company is developing a technology system using ERP. Seen in the implementation of ERP implementation carried out by the company PT Brantas Abipraya (Persero) can make it efficient in terms of controlling company costs and easier in carrying out the process of evaluating control of projects carried out by the company.

Testing the Effect of Education and Training on Competitive Advantage

The calculation results obtained a t-count of 2.42 and a t-table value of 1.96 (t-count > t-table). This means that if H01 is rejected and Ha1 is accepted, then there is a significant effect of education and training on competitive advantage. Thus the hypothesis that states that there is an effect of education and training on competitive advantage is accepted.

From several indicators contained in education and training, an indicator of the type of training provided to employees that is comprehensive enough to use the ERP system needs to be carried out by the company. This is, of course, a consideration for the company because in achieving competitive advantage, the company must have competitive and superior Human Resources (HR) so that it can adapt to changes in the company's technological system. PT Brantas Abipraya (Persero) sees the need for education and training as very important to improve the quality of the company's human resources so that they can and are able to compete and adapt to changes in existing company technology. Therefore in implementing ERP implementation to achieve a competitive advantage, The company conducts training and education 2-3 times a week for employees so they can more quickly implement ERP technology systems to achieve the company's competitive advantage. Training and education are carried out by the company by bringing in teaching staff who are competent in this matter.

Testing the Effect of Vendor Support on Competitive Advantage

The calculation results obtained a t-count of 2.34 and a t-table value of 1.96 (t-count > t-table). This means that if H01 is rejected and Ha1 is accepted, then there is a significant influence of vendor

support on competitive advantage. Thus the hypothesis that vendor support has an effect on competitive advantage is accepted.

Of the several indicators contained in vendor support, the indicator requires a fast response from the software vendor if a problem arises that needs to be addressed by the company. This is, of course, a consideration for the company because in order to achieve a competitive advantage, the company must have good vendor support to provide maximum results. PT Brantas Abipraya (Persero) sees that vendor support in developing ERP technology systems in companies is very helpful in accelerating the implementation of ERP systems in accordance with the company's business processes. Therefore, in implementing the ERP system to achieve a competitive advantage, the company meets three times a week with outdoor vendors to develop the existing ERP system in the company according to the company's needs.

Testing the Effect of Organizational Culture on Competitive Advantage

The calculation results obtained a t-count of 2.24 and a t-table value of 1.96 (t-count > t-table). This means that if H01 is rejected and Ha1 is accepted, then there is a significant influence of organizational culture on competitive advantage. Thus the hypothesis that organizational culture influences competitive advantage is accepted.

From several indicators contained in the organizational culture, the employee indicators have been involved in the design of new business processes that need to be carried out by the company. This is, of course, a consideration for the company because in achieving the company's competitive advantage, all employees must participate, play an active role, and be involved in terms of the latest business process design where the ERP implementation system is implemented in the company. PT Brantas Abipraya (persero) sees organizational culture as very important to help change the implementation of the old application system into an ERP implementation system. The active role of all employees in supporting the implementation of ERP implementation in the company to achieve the company's competitive advantage.

Testing the Effect of ERP Implementation Success on Competitive Advantage

The calculation results obtained a t-count of 2,27 and a t-table value of 1.96 (t-count > t-table). This means that if H01 is rejected and Ha1 is accepted, then there is a significant influence on the success of ERP implementation on competitive advantage. Thus the hypothesis which states the success of ERP implementation on competitive advantage is accepted. These results are supported by the research conducted by Nawawi and Yunia (2021), who found ERP implementation had a positive impact on a company's competitive advantage, and research conducted by Winahyu (2005) found ERP implementation had a positive effect on a company's competitive advantage.

Testing the Influence of Top Management Support, Effective Project Management, Business Process Reengineering, Software and Hardware, Education and Training, Vendor Support, Organizational Culture, and Success of ERP Implementation on Competitive Advantage

The calculation results obtained a t-count of 4.45 and a t-table value of 1.96 (t-count > t-table). This means that if H01 is rejected and Ha1 is accepted, then there is a significant influence of top management support, effective project management, business process reengineering, software and hardware, education and training, vendor support, organizational culture, and successful ERP implementation on competitive advantage. Thus the hypothesis stating top management support, effective project management, business process reengineering, software and hardware, education and training, vendor support, organizational culture, and successful ERP implementation of competitive advantage is accepted. These results are supported by the research conducted by Mudiantono (2013), who found business process reengineering, effective project management, education and training, top management support, and selection of software and hardware have an effect on competitive advantage.

4. Conclusion

Top management support has a positive and significant effect on the success of ERP implementation. Several indicators contained in top management support the indicator shows leadership attitude that top management does in implementing ERP implementation, which is needed in the company. Effective project management has a positive and significant effect on the success of ERP implementation. From several indicators contained in effective project management, the company indicator determines a project leader who is experienced in implementing ERP implementation systems that need to be carried out by companies. Business process reengineering has a positive and significant effect on the success of ERP implementation. From several indicators contained in business process reengineering, company indicators integrating ERP systems with other management information systems need to be done by the company. Software and hardware have no positive and significant effect on the success of ERP implementation.

The indicators on software and hardware that most influence the success of ERP implementation are companies integrating ERP systems with other management information systems in the company. However, this point has not been maximized by the company. Education and training have a positive and significant effect on the success of ERP implementation. Indicator with direct training related to ERP system users and the selection of competent teaching staff during the training process needs to be carried out by the company. Software and hardware have no positive and significant effect on the success of ERP implementation. The indicators of software and hardware that most influence the success of ERP implementation are companies integrating ERP systems with other management information systems in the company.

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Vendor support has no positive or significant effect on the success of ERP implementation. The vendor support indicator that has the most influence on the success of ERP implementation is that vendor support continues even after implementing the system in terms of system maintenance and improvement in the company. Organizational culture has a positive and significant effect on the success of ERP implementation. The most influential indicator of organizational culture for the success of ERP implementation is that employees are aware of changes and are ready to deal with them.

Top management support has a positive and significant effect on competitive advantage. An indicator of top management support that influences competitive advantage is that top management continuously monitors project progress and provides direction to the company's implementation needs to be carried out. This is very important because in achieving a company's competitive advantage, all top management must provide full support for technological developments in the company so that all elements in the company can provide maximum results to increase the company's competitive advantage.

Effective project management has a positive and significant effect on competitive advantage. An indicator of effective project management that influences competitive advantage is having a formal plan for ERP implementation that needs to be carried out by the company. This is very important considering that in achieving competitive advantage, a company must have effective project management and form a champion team in realizing all the implementation of existing technology systems in the company so that it can provide a good company competitive advantage.

Business process engineering has a positive and significant effect on competitive advantage. business process reengineering indicators that affect competitive advantage are companies ensuring data resilience (no data loss) between business processes. Software and hardware have a positive and significant effect on competitive advantage. Software and hardware indicators that affect competitive advantage are the suitability of software and hardware selection with company needs in ERP implementation. Education and training have a positive and significant effect on competitive advantage. Education and training indicators that influence competitive advantage are the type of training provided to employees that is comprehensive enough to use the ERP system. Vendor support has a positive and significant effect on competitive advantage. An indicator of vendor support that influences competitive advantage is the need for a fast response from the software vendor when problems arise.

Organizational culture has a positive and significant effect on competitive advantage. an indicator of organizational culture that influences competitive advantage is that employees have been involved in the design of new business processes. The success of ERP implementation has a positive and

significant effect on competitive advantage. Indicators of ERP implementation success that affect competitive advantage are the information produced by the implemented ERP system, which is concise, relevant, and available. Top management support, effective project management, business process reengineering, software and hardware, education and training, vendor support, organizational culture, and successful ERP implementation have a positive and significant effect on competitive advantage.

Acknowledgements

The authors would like to gratefully acknowledge the parties who have help them in conducting research, as well as the reviewers and the publisher of this journal.

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