16. Key user ERP capability maintaining ERP sustainability through effective design of business process and integration data management

by Zeplin Tarigan

Submission date: 11-Sep-2021 08:32PM (UTC+0700)
Submission ID: 1645930058
File name: e_design_of_business_process_and_integration_data_management.pdf (369.86K)
Word count: 8823
Character count: 49384

International Journal of Data and Network Science 5 (2021) 283–294

Contents lists available at GrowingScience

International Journal of Data and Network Science

homepage: www.GrowingScience.com/ijds

Key user ERP capability maintaining ERP sustainability through effective design of business process and integration data management

Zeplin Jiwa Husada Tarigan[a*], Adrie Oktavio[b], Widjojo Soeprapto[c], Dhyah Harjanti[c], Mariana Ing Malelak[c] and Sautma Ronni Basana[a]

[a]*Master Management, Petra Christian University, Surabaya, Indonesia*
[b]*Tourism Department, Universitas Ciputra Surabaya, Indonesia*
[c]*Management Department, Petra Christian University, Surabaya, Indonesia*

C H R O N I C L E

Article history:
Received: March 11, 2021
Received in revised format: April 9, 2021
Accepted: May 30, 2021
Available online: June 7, 2021

Keywords:
Effective design of business processes
ERP Suitability
Integration Data Management
Key user ERP Capability

A B S T R A C T

Business competition is increasingly complex, and there are no clear boundaries between products, so company operational processes are needed efficiently and effectively. The performance achieved is obtained through the implementation of an integrated information technology known as ERP. ERP implementation requires a person in charge of a business function called a key user who understands business processes and collaborates with ERP system vendors. The study obtained data that can further process from 77 manufacturing companies in East Java by purchasing an ERP or self-development package. Data processing uses PLS to answer all research hypotheses. The results show that key user capability was able to have a direct effect on the effective design of business processes of 0.643 and integration data management of 0.373. In contrast, it had no direct impact on ERP suitability. Effective Design of Business Processes has an immediate effect on Integration Data Management of 0.338 and ERP suitability of 0.395. The results also show that Integration Data Management has a direct effect on ERP suitability of 0.462. The data processing results for the indirect effect showed that key user capability influenced ERP suitability through the effective design of business processes of 0.507. Key user capability affects ERP suitability through Integration Data Management, and it is obtained as much as 0.254. The last hypothesis, key user capability, influences ERP suitability through effective Design of Business Processes and Integration Data Management of 0.182. The study results provide theoretical contributions to ERP implementation success factors, while practical gifts give key users a good understanding of the company's business processes and ERP systems.

1. Introduction

Competition is increasingly complex in the business world, making it difficult for companies to select and implement existing business competition strategies. Current strategies need to be complemented by fast service and low-cost impact to increase competitiveness. Integrating information systems and boosting their effectiveness to generate more effective management in company operations is one strategy to attain this achievement (Siagian et al., 2021). The issue is that many businesses have yet to integrate information systems into their overall administration. Until far, these companies have only been supported by specific activities at their separate work locations as part of the process. This reality may result in easy misunderstanding in data communication between one place of business and another. Everyone will submit data at their work location, which could be a fundamental difference in data delivery. In comparison to companies that have integrated their functions, it takes a long

* Corresponding author. Tel.: +62312983145
E-mail address: zeplin@petra.ac.id (Z. J. H. Tarigan)

doi: 10.5267/j.ijdns.2021.6.005

time to coordinate data providing. Data from multiple sources reveals the operational conditions of the company and can aid in the efficiency of business processes and the decision-making of corporate management (Tarigan et al., 2021b). ERP has developed as an integration tool to combine all enterprise applications into a data storage center that is easily accessible to all required sections (Beheshti et al., 2014). Data integration in ERP technology is carried out with single data entry, data entry, which is a functioning department, so other functions in the company can use this data. Enterprise Resource Planning (ERP) is a method of employing information technology to manage a company's resources with hardware and software (Tarigan et al., 2019). ERP technology functions to coordinate and integrate information data in each business process and collaborate in value chain activities to produce fast decision making. It provides brief financial analysis and reports, sales on-time reports, production, and inventory reports (Ruivo et al., 2020). Collaboration of activities in the value chain can be in resource coordination with corporate partners, timely communication with suppliers, and good order fulfillment for corporate customers.

ERP implementation as part of information technology in companies hopes to accelerate business processes, increasing efficiency, and effectiveness (Tarigan et al., 2021a). The problem is that many factors can thwart the process at the time of implementation, so a process analysis and design are needed for proper ERP implementation (Christofi et al., 2013). ERP implementation in Korea manufactures integration data, configuration, adaptation, and user training (Hwang and Min, 2013). The factors that companies face in implementing ERP, among others: first, management does not provide the best team project on the implementation project regarding the competence of team members, the project team's credibility and innovation, effective team leadership, and team dedication, team responsibility, adequate number of teamwork, overlapping duties on the team, working approach less clear, objectives not understood by the project team (Tarigan et al., 2020; Beheshti et al., 2014). Second, Management fails to see that e-business is more than simply an investment in technology; it is also a business process improvement or enhancement enabled by technology (Tarigan et al., 2021a). An ERP system that is implemented correctly provides benefits to the company on an ongoing basis (Jagoda & Samaranayake, 2017). ERP implementation requires a considerable cost, a considerable level of risk, and a significant potential benefit. ERP system implementation results in the investment e-business risk of being unable to return (Fadlalla & Amani, 2015). ERP benefits are not optimal for company leaders who recognize that e-business is simply an investment in information technology, not a business investment backed by information technology. ERP resources in companies are information technology investments in software and hardware packages and information technology skills with specific objectives (Badewi et al., 2018; Glowalla & Sunyaev, 2014). ERP stands for enterprise resource planning, and it is a type of software that can assist businesses in better managing their operations. It can lower stock and inventory levels, enhance stock turnover, shorten order cycle times, boost productivity, improve communication, and have a positive influence on business benefits. (Sharma and Daniel, 2016; Tarigan et al., 2021c). Reduced lead times, on-time delivery, shorter cycle times, improved customer satisfaction, improved supplier performance, higher flexibility, lower quality costs, greater resource utilization, and decision-making abilities are all advantages of ERP (Jagoda and Samaranayake, 2017; Chang et al., 2015). ERP systems have been implemented in manufacturing companies to benefit from system integration across corporate groups; information data becomes complete, detailed, and fast. ERP system makes it easier for directors to analyze and make decisions; simpler business processes; production cost savings; and finally, the company's cash flow is more controlled (Tarigan et al., 2018). Adjustment of business processes to company conditions will make it easier for people who implement ERP because they already have suitable data structures and relationships (Panayiotou et al., 2015; Chang et al., 2015). Business processes are correlated with work effectiveness and key users' ability to implement ERP in the company. The company's ability to adapt the company's software and hardware with business processes to produce quality products and services and the ability to implement the company's strategic vision are competencies that are acquired in ERP implementation (Aburub, 2015). Business process reengineering has a positive effect on user involvement. By redesigning company processes by key users, it makes it easier to adjust the software to company needs and impacts the acceleration of ERP implementation (Garg and Agarwal, 2014). ERP software can be developed by companies using software created or using open-source, which the key user directs as the owner of the business process (Olson et al., 2018). Customer requirements as a key user in a company require a developer, business analysis, and consultants in designing the process to suit the company's needs (Parthasarathy and Daneva, 2014). The design process positively affects company performance and acceleration of ERP implementation, which has implications for implementation costs and increases service quality and speed. The procedure that has a consistent favorable impact on firm performance. An organization process that is standard in internal procedure and is routinely used impacts ERP implementation and improves the function (Drummond et al., 2017). If the ERP installation stages are completed successfully, several benefits can be realized. It is crucial to understand what elements influence effective and unsuccessful implementation.

Culture organization determines the success and failure of adopting ERP: due to the provision of information data that is less trusted because it prefers oral communication; difficult cooperation due to ERP using foreign languages, and difficulties in carrying out business process change carried out jointly between the project team and company management (Tarigan et al., 2020; Sharma & Daniel, 2016; Beheshti et al., 2014). The failure and success of ERP implementation are determined by top management commitment, user involvement, business process reengineering, project management, and ERP teamwork and composition (Garg & Agarwal, 2014). ERP projects might fail right at the outset of deployment or at any point during the process. In the long run, there is no substantial impact on the company's finances. Whereas, in the event of a partial failure,

ERP implementation can impair daily operations. A successful ERP deployment, on the other hand, can lead to overall success. Everything is running well, with no jerks or delays in the implementation. Some alignment concerns arise, though they are only a minor annoyance.

ERP technology implementation is often regarded as a difficult and complex task, causing top management and users to be hesitant to do so. The complexity of ERP requires knowledge management (Fadlalla & Amani, 2015). When adopting ERP in a company, there is an amazing phenomenon that occurs: the key user determines success as a manager in a department supported by top management and the user (Ram & Corkindale, 2014; Maas et al., 2016). The longer the ERP implementation will result in a relatively large increase in costs for the company. The ERP program's deployment has two sorts of users: key users and end-users. A key user is a member of the project team who can make direct modifications to work procedures in his department. Key users as ERP implementers have different perceptions with users in organizational processes in the company, the capacity to make changes, and interactions between businesses (Drummond et al., 2017). ERP implementation involves team competition, project team competence, scope management, expectation management, communication within the project, and budget control (Garg & Chauhan, 2015). Key users are selected from departments related to their operations, usually always associated with business processes, and have more knowledge in their work areas and general department managers. At the same time, end-users are users of the ERP design results developed by key users (Tarigan et al., 2020). Key users will also specialize in specific aspects of the ERP system and serve as end-user trainers, educators, consultants, help-desk resources, and agents (Wu & Wang, 2007). The end-user only has specific knowledge of the parts of the system that the end-user needs to work on. User acceptance is essential in implementing an ERP system to suit the business needs (Nandi and Kumar, 2016). As a result, the involvement of important users is critical to the end system's performance because it influences the speed of deployment and the outcomes of exceptional ERP deployment (Maas et al., 2016). In the implementation stage, the consultant is in the direction of the key user because the system is an information system configuration package. Customization and process design usually involve a strong relationship between the key user/user and the consultant (Panayiotou et al., 2015). Key users adjust the existing business processes in the company by customizing software ERP and directing end-users to provide the data needed by the ERP system (Chang et al., 2015). The provision of this data is adjusted to the reports and data tables and the form of the company data format in accounting and finance, which influences the technical problems of financial reporting to the government. The ERP implementation process is said to end when output of the management data from the ERP process results can be used by the company and helps make decisions. In the next stage, end users can understand and understand their respective functions. The choice of ERP in a manufacturing company is for the full integration of information from start to finish in all departments (Badewi et al., 2018; Tarigan et al., 2021a). ERP can integrate and collaborate with company partners to improve ERP Capability (Ruivo et al., 2020). The position of the key user is crucial to describe and determine what needs are required by the company (Jagoda & Samaranayake, 2017). The ERP system is chosen by management and applied to the company, so key users conduct end-user training (Wu and Wang, 2007). Key users and end-users are directly involved with the ERP system. End-user is an individual who uses the ERP program as directed by the user as user involvement (Garg and Agarwal, 2014). The attitude of key users and end-users as employees in the company is influenced the condition of the company culture in sharing knowledge to achieve successful ERP implementation (Maas et al., 2016). A strong relationship between key users, key users and end-users, and key users and vendors and consultants is required to collaborate: a discussion form is required to collaborate; communication on process and procedure changes; control, coordination, and responsibility within the organization; increased motivation between existing components; work orientation and company focus (Tarigan et al., 2020). The company's top management is supportive of the team and committed to ERP implementation. Still, if there is no sharing of information between key users in the company, ineffective communication in designing processes, and providing data, then reluctance appears. Team members to implement ERP due to limited capabilities (Park et al., 2007). Because the benefits of software and hardware ERP are not gained by the firm, and the investment expenditures paid by the firm are not maximally advantageous, this reluctance will have an influence on ERP performance in the company. This study examines the impact of key user ERP capability on ERP suitability through effective business processes and integration data management.

2. Literature Review Previous

Research related to the main problem in this study will be reviewed, especially on the variables used in this study. This review is expected to help solve this research and make it easier to understand and see some of the strengths to support and clarify the research and see the existing deficiencies to improve.

2.3. Key user ERP Capability

ERP is information technology that can improve company capabilities through integrated ERP implementation, increase system capabilities in the company, and company employees' knowledge capabilities in using ERP technology (Tarigan et al., 2021c; Maas et al., 2016). Information technology capabilities are essential for companies to build and develop company systems to increase employees' individual knowledge skills (Chae et al., 2018). The information technology capability that the company gets is not only internal but can collaborate with supply partners essentials (Siagian et al., 2021). ERP capability is obtained by involving the operating system together, communicating in real-time, working together, and increasing the company's effectiveness and key users (Ruivo et al., 2020). ERP capability as an integration system can increase operation

capability (Tarigan et al., 2021b). ERP implementation in companies related to education and training, enterprise-wide change management plans, user involvement, and testing and troubleshooting (Garg and Chauhan, 2015; Garg and Agarwal, 2014). Key users as managers are essential factors in completing a project ERP implementation (Tarigan et al., 2018; Ram and Corkindale, 2014). A user is a person who has been designated and elected by management to be totally responsible for the preparation and completion of ERP under corporate management's guidance (Wu & Wang, 2007). The project team as a manager plays a role as inter-departmental coordination or is fully responsible for implementing ERP (Ram & Corkindale, 2014). The key user (project team) is attempted to consist of different departments and has cross-functions (Garg and Chauhan, 2015; Beheshti et al., 2014). A successful ERP implementation relies heavily on cross-functional teams (Tarigan et al., 2020). The team must be composed appropriately (Park et al., 2007). Team members as implementers must be experienced in various technical aspects (Drummond et al., 2017). The team should consist of people within the organization and some from outside the organization. High dedication, good communication, and full-time work commitment are the criteria for a project team that accelerates the ERP implementation process in the company. As a key user who comes from interdisciplinary knowledge and has different experiences, the project team often conflicts between team members, resulting in a longer ERP implementation completion time. In addition, the existence of a project team that does not have attitudes and motivations and is not communicative will hinder implementation. ERP implementation to suit the company's needs and not fail, consultants, business analysts, and developers are needed to understand the needs of key users as customers (Parthasarathy and Daneva, 2014). In addition, the project team's composition was not appropriate, and communication was inadequate as a cause of conflict. Meanwhile, project managers or project coordinators who do not understand project elements and do not have charismatic leadership are factors that hinder ERP implementation. This research focuses on a project team's key user IT capability and has a business process area in the company. The determinants of the effectiveness of the key user are as follows: the competence of team members, the composition and number of team members from the organization is adequate, team members have clear duties and clear responsibilities.

2.4. Effective Design of Business Process

The company strategy sets goals and guides how organizational capabilities can be the best tools to achieve an increased competitive position (Aburub, 2015). According to company conditions, business process analysis and design are essential when implementing ERP (Christofi et al., 2013). The process design strategy is something that can increase the company's competitive edge because: it can provide guidance on the work completion process and integrated process flow, and variations in performance achievement and the flow of materials, workers, and information which are competitive resources in the supply chain flow (Tarigan et al. al., 2021b). In the context of a company's growth and development strategy, coordination and integration are required (Chang et al., 2015). Strategy creation and change by top management, and gradually adapting company strategy to process design strategy. The design of the company's business processes needs the company to pay attention to the current government regulations (Sharma and Daniel, 2016; Maas et al., 2016). Business process redesign improves business processes, improving process orientation, efficiency, and performance (Elgendy, 2021). Adjustment of company organizational processes with ERP software will facilitate ERP implementation and is a success factor (Olson et al., 2018; Nandi and Kumar, 2016). Conversely, if the adjustments made to organizational processes are not appropriate, it will hinder ERP implementation and even thwart ERP implementation (Panayiotou et al., 2015). Hybrid ERP used by companies with ERP systems that are communicated with enterprise social software (ESS) can support efficient business processes for the company and increase the flexibility of response to business process change requests (Greasley & Wang, 2016). Minimal process changes are adjusted to software ERP and anticipate process errors, process integration between purchasing, manufacturing, and distribution, adoption processes in a company, process design to the detailed activity stage are adjusted to software ERP (Sharma and Daniel, 2016). ERP implementation design in companies is the responsibility of key users by involving users, company management, consultants, and analysts (Drummond et al., 2017; Parthasarathy and Daneva, 2014). The implementation design is very dependent on the key user ERP capability that the company has that can collaborate with partners as a value chain (Ruivo et al., 2020). ERP implementation in Korean manufacturing companies emphasizes process configuration by creating an ERP system that can meet the needs of organizational processes. The ERP system has accommodated the changes needed by the organization, and the ERP system supports the company's business practices (Hwang and Min, 2013). Based on the explanation, this study emphasizes operational activities and communication between key users in designing existing processes in the company are: team members understand the process, team members are oriented towards process effectiveness, team members are oriented to building a collaboration system with partners, and team members understand the magnitude of the impact that process changes have on the company.

2.5. Integration Data Management

ERP can facilitate access to data related to good products and processes to related parties at the right time in the product life cycle to support all business processes using this data (Christofi et al., 2013). Structured data documentation can make the product development process better. The emphasis of the ERP concept is a form of documentation about the relationship between data products and the structure in the document version and the relationship between product components related to the provision of reports (Chang et al., 2015). The key user must calculate all the total costs in the company's internal processes by preparing an environment related to product data. ERP implementation in Korean manufacture by integrating ERP mod-

ules, integrating all transactions in the ERP system, integrating ERP systems with partners, and ERP systems with manufacturing management systems are used as standard (Hwang & Min, 2013). Product Data Management in ERP can choose one of the three types of databases used, namely: first, a centralized database with a database, secondly a distributed database using more than two databases, and third, a hybrid database that has many databases but has a centralized database. The need for data in the implementation process and the accuracy of data in providing data in real-time will facilitate manager decision-making and accelerate the ERP implementation process (Chang et al., 2015). The existing data structure in the ERP system can provide flexible and integrated information (Elgendy, 2021). This study adopted the research Tarigan et al. (2019), emphasizing data management integrity in companies with a single database, namely structure data and master files, data integrity, data maintenance, reports, and table data.

2.6. ERP Suitability

ERP technology is a standard commercial software package used as a comprehensive corporate business system (Glowalla & Sunyaev, 2014). Software is ERP chosen by companies considering software and hardware ERP capabilities, knowledge of ERP software suppliers, support from consultants, software upgrades, and the latest technology. The company will use software ERP as seen from the stability of the software, the function of the software in integrating the system, and the system's reliability. The ERP technology used in ERP implementation is implementation strategy, adequate information technology infrastructure, minimal customization, and data conversion and accuracy (Garg & Chauhan, 2015). With limitations in software and hardware, the software needs to be developed as required by customizing it (Tarigan et al., 2019). ERP related as the technology used by companies is Customization of ERP, Technological complexity, Compatibility, Legacy systems, data analysis and conversion, and data accuracy (Ram & Corkindale, 2014). The process of customizing the company's software and hardware also takes a relatively long time to hinder ERP implementation (Olson et al., 2018). ERP stands for Enterprise Resource Planning, and it is a software package that integrates business processes and functions to offer a company concept using a mix of business management and information technology concepts (Drummond et al., 2017). Its strength is providing a comprehensive business process for the company by integrating information technology infrastructure (Siagian et al., 2021; Badewi et al., 2018). ERP systems consist of a single database, a single application, and a goal-oriented integrated integration of the complete enterprise system into a single standard application (Glowalla & Sunyaev, 2014). Human resources, accounting, sales, manufacturing, distribution, and supply chain management are all served by an ERP system (Jagoda & Samaranayake, 2017; Tarigan et al., 2021b). ERP software has the advantage of speeding up decision-making, lowering expenses, and allowing managers to control multiple corporate functions simultaneously over a vast region. This study emphasizes the benefits of ERP products as implemented in the company are accuracy of data, response time, completeness, and system integrity.

4. Research Framework

The company's performance can be improved by successfully implementing technology enterprise resource planning (Glowalla & Sunyaev, 2014). ERP can increase a company's global competitiveness because it can increase its operations' efficiency. ERP implementation is very complex because it requires a lot of money and time to be incurred by the company starting from the pre- and post-implementation stages (Greasley & Wang, 2016). Company readiness in implementing ERP is essential to achieve successful implementation (Chang et al., 2015). The benefits of ERP cannot be fully realized unless firm boundaries and reconciliation mechanisms are determined technically and organizationally based on the principles of process orientation. Measurement should be carried out in a balanced perspective and provide helpful information that can inform the decision-making process and help convey company objectives. Through this action, it is hoped that the business will be more competitive. This condition reflects the importance of using information technology systems in the future based on business process management principles (Tarigan et al., 2021a). Companies need data integration in ERP, so the processes and functions, and stages of ERP implementation in the company are determined by the project team consisting of management, IT staff, and key users and assisted by end-users (Wu & Wang, 2007). The top management functions in explaining the objectives of ERP implementation and fully supporting system integration (Aburub, 2015). IT staff as buyers representing company management have a role in selecting software and hardware ERP fully supported by company management. IT staff will list the functions of software and hardware ERP, then write down the ERP candidates that are suitable for the company according to the processes in the company (Jagoda and Samaranayake, 2017). IT staff, key users, and management collaborate and discuss to decide the type of software and hardware to be used. Customization and process design are usually carried out by consultants and key users to meet the needs of departments related to the ERP system (Panayiotou et al., 2015). Customization and process design necessitate a close working connection between key users and ERP implementers, as well as users (Drummond et al., 2017). Key users adjust existing business processes in the company by customizing software ERP and directing end-users to provide the data needed by the ERP system. The ERP implementation process is said to end when output of the management data from the ERP process or the advantages of ERP software and hardware can be used by the company and helps in improving company performance. Finally, the end-user can understand and understand their respective functions. The research's conceptual framework is to assess the strength of the product owned by software and hardware ERP, which is decided by key users' ERP capabilities through effective business process design and data management integration to increase ERP appropriateness. The hypothetical model used to explain the problem of the research objectives will be verified as in Fig. 1.

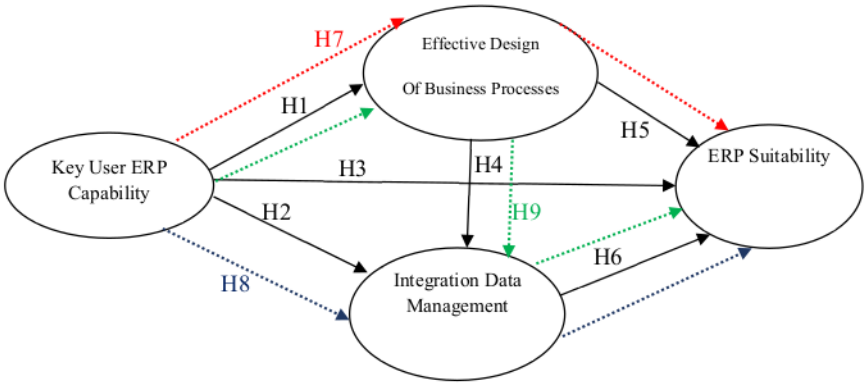


Fig. 1. The conceptual framework and research hypothesis

H_1 = Key User IT Capability has an influence on the effective design of business processes.
H_2 = Key User IT Capability has an influence on data management integration
H_3 = Key User IT Capability has an influence on ERP suitability
H_4 = Effective design of business process has an influence on data management integration
H_5 = Effective design of business process has an effect on ERP suitability
H_6 = integration of data management has an effect on ERP suitability.
H_7 = Key User IT Capability has an influence on ERP suitability through effective design of business processes.
H_8 = Key User IT Capability has an influence on ERP suitability through the integration of data management.
H_9 = Key User IT Capability has an impact on ERP suitability through effective design of business processes and integration data management.

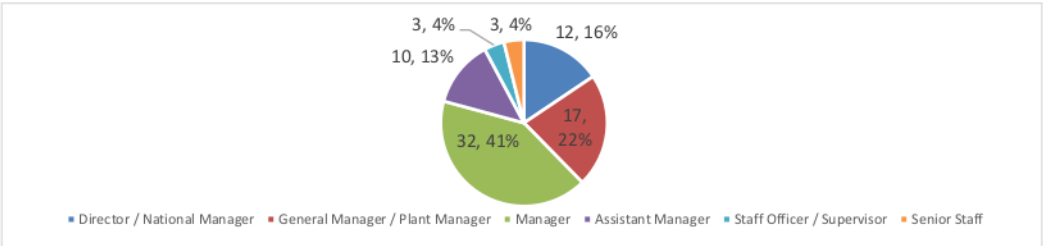
4. Research Methods

The data for this study comes from enterprises registered with the East Java Ministry of Industry and Trade. The company with the area where the company is located and is the center of the manufacturing industry for East Indonesia, located at the level of Surabaya Municipality, Sidoarjo Regency, Pasuruan Regency. Mojokerto Regency and Gresik Regency, which consist of manufacturing companies. SAP, Oracle, Baan, Peoplesoft, JD Edwards, MFG Pro, Microsoft Dynamic applications, and self-development of information systems are examples of companies that employ ERP information technology. Companies use ERP system development by inviting local developers to map the company's business process system and create an integrated ERP system. Data were collected in an industrial manufacturing area in East Java and obtained from 77 companies by distributing questionnaires and interviews. The Partial Least Square (PLS) analysis was employed in this investigation, with the calculating procedure aided by the application program software Smart PLS.

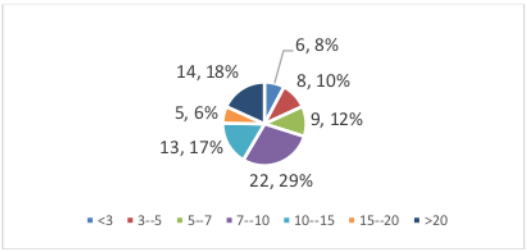
5. Analysis and Discussion

5.1. Descriptive Analysis of Research

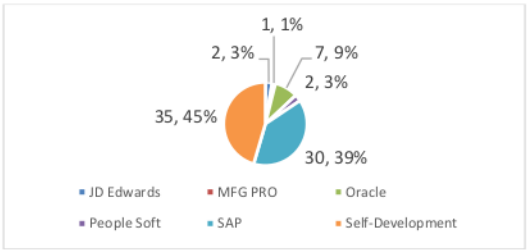
Direct distribution of questionnaires to 100 manufacturing industry enterprises in East Java was carried out utilizing enumerators as questionnaires in the field. The distribution results showed that 15 companies had not answered the questionnaire given at the appointed time, six respondents were not willing to provide answers because they were not allowed to provide solutions. Meanwhile, two respondents did not provide correct answers; namely, the questions were not answered thoroughly, so that 77 questionnaires could be processed further. The distribution of respondents by position is shown in Fig. 1.



Position of Respondents in Manufacturing Companies



Characteristics of Respondents based on Length of Work



Characteristics of Respondents based on ERP Implementation

Fig. 2. Personal characteristics of the participants

Fig. 2 obtains the amount in Manager positions 32 (42%) and General Manager / Plant Manager 17 (22%). The position person in charge of ERP implementation in his department or the overall implementation in a manufacturing company. The distribution of respondents based on length of work is shown in Fig. 2. According to data Fig. 2, the number of respondents who had long-time work from 7 to 10 years as 22 (29%) and had work experience of more than 20 years amounted to 14 (18%). The respondents have had a long work experience, so they understand the company's business processes as a whole and well. Respondents' ability to redesign business processes according to operational processes and their needs tailored to ERP applications can be adequately accommodated. The distribution of respondents based on the type of ERP implementation in the company is shown in Fig. 3. Fig. 3 also shows that the ERP implemented in the largest companies in self-development is 35 (45%). Manufacturing companies develop corporate ERP according to company needs, where most companies use local consultants to develop ERP systems. The software is used in the development of local programmers by making programs as needed. The investment price for independent ERP development is not too large when compared to companies using ready-made ERP. The payment process caused the capabilities of the company and the needs of the company. Self-development ERP takes a long time to implement and often stops in the implementation process when the key user, as the person in charge, leaves the company and moves to another company. The second ERP implementation, namely SAP, amounted to 30 (39%) due to the large number of large companies using this application and providing tremendous and sustainable benefits.

5.2. Hypothesis Analysis of Research

In this research, the inner model and outer model tests were used as the criteria test for the conformity index on the PLS. The value indicates the inner model is: convergent validity, average variance extracted, composite reliability, Cronbach's Alpha, and rho_A.

Table 1
Evaluation Criteria for Conformity of Outer Model

Criteria	Results	Critical Value	Evaluation Model
Convergent Validity (lowest loading factor)	Key User ERP Capability (lowest = 0.726) Effective Design of Business Processes (lowest = 0.677) Integration Data Management (lowest = 0.731) ERP Suitability (lowest = 0.633)	≥ 0.5	Good
Average Variance Extracted (AVE)	Key User ERP Capability = 0.563 Effective Design of Business Processes = 0.514 Integration Data Management = 0.593 ERP Suitability = 0.584	AVE ≥ 0.5	Good
Composite Reliability	Key User ERP Capability = 0.836 Effective Design of Business Processes = 0.774 Integration Data Management = 0.853 ERP Suitability = 0.849	≥ 0.7	Good
Cronbach's Alpha	Key User ERP Capability = 0.737 Effective Design of Business Processes = 0.708 Integration Data Management = 0.772 ERP Suitability = 0.766	≥ 0.7	Good
rho_A	Key User ERP Capability = 0.751 Effective Design of Business Processes = 0.707 Integration Data Management = 0.776 ERP Suitability = 0.849	≥ 0.7	Good

The structural model results have shown that all the criteria used have good scores, and therefore, this model has been accepted (Table 1). The results of the study by testing existing hypotheses and adjusted to the research structure model resulted in the model structure and the magnitude of the relationship between the variables summarized in Fig. 3 and Table 2.

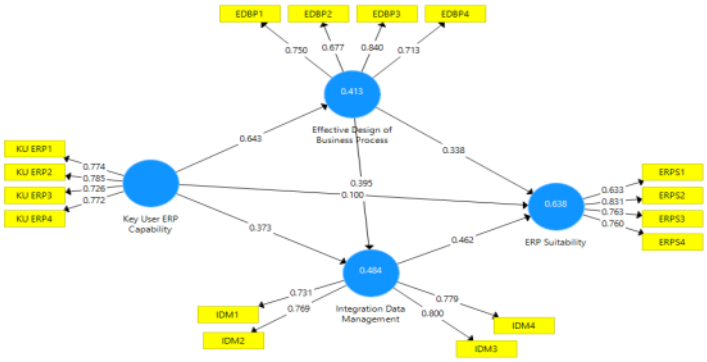


Fig. 3. Loading factor and Structural Model

Table 2
Path Coefficient Direct Effect

Path Coefficient	Original Sample	Sample Mean	Standard Deviation	T-Statistics	P-Value
Key User Capability → Effective Design of Business Process	0.643	0.655	0.064	10.065	0.000
Key User Capability → Integration Data Management	0.373	0.375	0.103	3.620	0.000
Key User Capability → ERP Suitability	0.100	0.097	0.108	0.927	0.354
Effective Design of Business Process →Integration Data Management	0.338	0.337	0.105	3.228	0.001
Effective Design of Business Process → ERP Suitability	0.395	0.396	0.108	3.660	0.000
Integration Data Management → ERP Suitability	0.462	0.460	0.109	4.258	0.000

Based on the structural model analysis in Fig. 3 and Table 1, the hypotheses s research can be determined: the first hypothesis (H1) key user capability for effective design of business processes, the p-value is 0.000 less than 0.050 or the t-statistics value is 10.065 greater than 1.96, it is stated that the first hypothesis is accepted. Key user Capability influences the effective design of the business process of 0.643. The second hypothesis (H2) key user capability for data management integration obtained a p-value of 0.000 less than 0.050 or at-statistics value of 3.620 greater than 1.96, and it is stated that the second hypothesis is accepted. Key user capability influences data management integration of 0.373. The third hypothesis (H3) Key User Capability to ERP suitability obtained a p-value of 0.354 greater than 0.050, or the t-statistics value of 0.927 is smaller than 1.96, and it is stated that the third hypothesis is rejected. Key User Capability has no impact on ERP suitability. The fourth hypothesis (H4) for effective design of business processes on data management integration obtained a p-value of 0.001 less than 0.050 or at-statistics value of 3.228 greater than 1.96, and it is stated that the fourth hypothesis is accepted. Effective design of business processes affects data management integration. The fifth hypothesis (H5) for effective design of business processes on ERP suitability, the p-value is 0.000 less than 0.050 or the t-statistics value is 3.660 greater than 1.96, and it is stated that the fifth hypothesis is accepted. Effective design of business processes affects ERP suitability. The sixth hypothesis (H6) integration data management on ERP suitability, obtained a p-value of 0.000 less than 0.050 or the t-statistics value of 4.258 is greater than 1.96, and it is stated that the fifth hypothesis is accepted. Integration of data management affects ERP suitability. Testing the seventh hypothesis (H7) to the ninth hypothesis (H9) is obtained from the indirect effect test in Table 3.

Table 3
Path Coefficient Indirect Effect

Path Coefficient	Original Sample	Sample Mean	Standard Deviation	T-Statistics	P-Value
Key User Capability → Effective Design of Business Process -> ERP Suitability	0.507	0.516	0.096	5.279	0.000
Key User Capability → Integration Data Management → ERP Suitability	0.254	0.260	0.079	3.233	0.001
Key User Capability → Effective Design of Business Process → Integration Data Management → ERP Suitability	0.182	0.183	0.068	2.669	0.008

Seventh hypothesis (H7) key user capability to ERP suitability through effective design of business processes as a mediating variable, the p-value is 0.000 less than 0.050 or at-statistics value of 5.279 is greater 1.96, and it is stated that the seventh hypothesis is accepted. Key user capability affects ERP suitability through effective design of business processes. The eighth hypothesis (H8) Key user capability to ERP suitability through the integration of data management as a mediating variable obtained a p-value of 0.001 less than 0.050 or at-statistics value of 3.233 greater than 1.96, and it is stated that the eighth hypothesis is accepted. Key user capability affects ERP suitability through data management integration. The ninth hypothesis (H9) key user capability to ERP suitability through effective design of business processes and integration of data management as a mediating variable obtained a p-value of 0.008 less than 0.050 or at-statistical value of 2.669 greater 1.96, and it is stated that the ninth hypothesis is accepted. Key user capability affects ERP suitability through effective design of business processes and integration of data management. Based on testing the research hypothesis, the first hypothesis, up to hypothesis Nine (H1-H9), obtained eight accepted hypotheses, and only one hypothesis was rejected.

5.3. Discussion

Based on the results of hypothesis testing in a row, it can be shown by the accepted first hypothesis (H1), which shows that Key user Capability influences the effective design of business processes. Key user capability, indicated by the presence of adequate composition and number of team members from the organization and carrying out their duties and responsibilities properly, can impact the effective design of business processes. This relationship shows that the key user understands the process of change and redesign of the business process to build a better-suited ERP system. The second hypothesis (H2) is accepted, which indicates that key user capability influences data management integration. Key user capability with each key user being able to carry out duties and responsibilities and having adequate composition and number of team members affects the integration of data management between cross-functional areas running well. Data maintenance and data integrity in the company can provide information technology implementation that runs well and regularly. The company has obtained the advantages of ERP in increasing real-time. The third hypothesis (H3) is rejected, which indicates that Key User Capability does not affect ERP suitability. Key users owned by the company with adequate composition and number of teams and having clear duties and responsibilities were not able to directly impact ERP suitability. This relationship does not impact because the key user performs the process in operational conditions first or makes improvements to the ERP system. If this condition has been reached, then we can achieve ERP suitability properly.

The fourth hypothesis (H4) is accepted, which indicates that the effective design of business processes affects data management integration. Effective design of business process with team members understanding the process and the magnitude of the impact of process changes on the company impact integration data management. Understanding the business process and its effects can build a good data integrity and maintenance system so that its utilization can create a collaborative system with company partners. The fifth hypothesis (H5) is accepted, indicating that the effective design of business processes affects ERP suitability. The company's ability in the Effective design of the business process is oriented to build a collaborative system with partners, and business processes can improve ERP suitability. An excellent, effective design of the business process will enable the company to achieve a fast response time and completeness of information to improve company performance. The sixth hypothesis (H6) is accepted, which indicates that data management integration affects ERP suitability. This relationship shows that the integration of data management built through data maintenance, reports, data tables, and data integrity increases system integrity and response time as a measure of ERP suitability. Integration of cross-functional data in the company improves ERP suitability on an ongoing basis and makes it easier for management to make the right decisions.

The seventh hypothesis (H7) is accepted, indicating that key user capability affects ERP suitability through the effective design of business processes. Key user capability with adequate composition and number of members will produce a fast response time as ERP suitability through a good understanding of the key user process. The ability of a key user in building a good business process system in manufacture can collaborate with partners, and so that can create a completeness ERP suitability. The eighth hypothesis (H8) is accepted, which indicates that key user capability influences ERP suitability through data management integration. A company's key user capability by defining clear duties and responsibilities can produce good data integrity by understanding changes in processes for the company and their impacts. This relationship affects the company to build partnerships with the company's suppliers and customers. The ninth hypothesis (H9) is accepted, which indicates that key user capability influences ERP suitability through effective design of business processes and data management integration. The results of the ninth hypothesis suggest that the composition and number of the key user team determine the competence of understanding the business process and integration with the company's external partners. Besides that, it impacts data maintenance and data integration resulting from operational process reports so that real-time data can be seen and a fast response to make decisions by its top management. Research conducted at manufacturing companies in East Java regarding process design in the company, especially in the process flow and the relationship between departments (interface and interconnection), was left to departmental discussions (key users). All key users (department heads) in the company generally have more than five years of experience in the same field, so they understand the process flow in the company. The relationship between departments in the company is an indispensable design and is a complex job because of the data relationship between departments. Key user ERP capability can improve the company's operational system, described in a synchronous company ERP system to help top management make the right decisions in real-time.

6. Conclusion

The findings of this study show that key user ERP capability can have a positive effect on the improvement of effective business process design because key users have an adequate composition and number, as well as clear duties and responsibilities, based on the results of data analysis and previous discussion. The same thing happened to key user ERP capability, which positively impacted data management integration. The difference between key user ERP capability does not affect ERP suitability. Effective design of business processes has a positive impact on data integration management due to the ability of key users to understand business processes and their effect on the company as well as the company's partnerships with external parties. Effective design of business processes also has a positive impact on ERP capability, which results in fast response time and real-time data for top management in making decisions. Integration of data management in the company has a direct

impact in increasing ERP suitability because data maintenance, reports, data tables, and data integrity provide an increase in cross-functional to improve company performance.

Key user ERP capability has an impact on ERP suitability through effective design of business processes. This relationship is due to key users' ability to carry out their duties and responsibilities to understand the company's business processes to build real-time processes and fast responses in the company properly. Key user ERP capability has an impact on ERP suitability through integration of data management. This relationship is since the key user can maintain data and build good reports and data relations so that it provides fast information for top management in making decisions. This study contributes to the implementation of ERP before and after implementation at the company. Suggestions for further research are that ERP implementation needs to be done by providing extra work and maximally for key users in making continuous and continuous improvements oriented to ERP implementation success. This activity can be carried out if there is a strong commitment from all parties to make improvements by referring to the company's vision, mission, and goals. A work culture as teamwork is needed to achieve this success. Therefore, it is necessary to conduct further research on the relationship of organizational citizenship behavior (OCB) with the role of key users.

References

Aburub, F. (2015). Impact of ERP systems usage on organizational agility: An empirical investigation in the banking sector. *Information Technology & People*, *28*(3), 570-588, doi.org/10.1108/ITP-06-2014-0124

Badewi, A., Shehab, E., Zeng, J., & Mohamad, M. (2018). ERP benefits capability framework: orchestration theory perspective. *Business Process Management Journal*, *24*(1), 266-294, doi.org/10.1108/BPMJ-11-2015-0162

Beheshti, H.M., Blaylock, B.K., Henderson, D.A., & Lollar, J.G. (2014). Selection and critical success factors in successful ERP implementation. *Competitiveness Review*, *24*(4), 357-375, doi.org/10.1108/CR-10-2013-0082

Chae, H.-C., Koh, C.E., & Park, K.O. (2018). Information technology capability and firm performance: Role of industry. *Information & Management*, *55*(5), 525-546, doi.org/10.1016/j.im.2017.10.001

Chang, T.-S., Fu, H.-P., & Ku, C.-Y. (2015). A novel model to implement ERP based on dynamic capabilities: A case study of an IC design company. *Journal of Manufacturing Technology Management*, *26*(7), 1053-1068, doi.org/10.1108/JMTM-12-2013-0185

Christofi, M., Nunes, J.M.B., Peng, G.C., & Lin, A. (2013). Toward ERP success in SMEs through business process review prior to implementation. *Journal of Systems and Information Technology*, *15*(4), 304-323.

Drummond, P., Araujo, F., & Borges, R. (2017). Meeting halfway: Assessing the differences between the perceptions of ERP implementers and end-users. *Business Process Management Journal*, *23*(5), 936-956, doi.org/10.1108/BPMJ-05-2016-0107

Elgendy, A.F. (2021). The mediating effect of big data analysis on the process orientation and information system software to improve supply chain process in Saudi Arabian industrial organizations. *International Journal of Data and Network Science*, *5*(2), 135–142, doi: 10.5267/j.ijdns.2021.1.003.

Fadlalla, A., & Amani,F. (2015). A keyword-based organizing framework for ERP intellectual contributions. *Journal of Enterprise Information Management*, *28*(5), doi.org/10.1108/JEIM-09-2014-0090

Garg, P., & Agarwal, D. (2014). Critical success factors for ERP implementation in a Fortis hospital:an empirical investigation. *Journal of Enterprise Information Management*, *27*(4), 402-423, doi.org/10.1108/JEIM-06-2012-0027

Garg, P., & Chauhan, A. (2015). Factors affecting the ERP implementation in Indian retail sector: A structural equation modelling approach. *Benchmarking: An International Journal*, *22*(7), 1315-1340, doi.org/10.1108/BIJ-11-2013-0104

Glowalla, P., & Sunyaev, A. (2014). ERP system fit – an explorative task and data quality perspective. *Journal of Enterprise Information Management*, *27*(5), 668-686, doi.org/10.1108/JEIM-08-2013-0062

Greasley, A., & Wang, Y. (2016). Integrating ERP and enterprise social software. *Business Process Management Journal*, *23*(1), 2-15, doi.org/10.1108/BPMJ-04-2015-0053

Hwang, W., & Min, H. (2013). Assessing the impact of ERP on supplier performance. *Industrial Management & Data Systems*, *113*(7), 1025-1047, doi.org/10.1108/IMDS-01-2013-0035

Jagoda, K., & Samaranayake, P. (2017). An integrated framework for ERP system implementation. *International Journal of Accounting & Information Management*, *25*(1), 91-109, doi.org/10.1108/IJAIM-04-2016-0038

Maas, J-B., Van Fenema, P.C., & Soeters, J. (2016). ERP as an organizational innovation: key users and cross-boundary knowledge management. *Journal of Knowledge Management*, *20*(3), 557-577, doi.org/10.1108/JKM-05-2015-0195

Nandi, M.L., & Kumar, A. (2016). Centralization and the success of ERP implementation. *Journal of Enterprise Information Management*, *29*(5), 728-750, doi.org/10.1108/JEIM-07-2015-0058

Olson, D.L., Johansson, B., & De Carvalho, R.A. (2018). Open-source ERP business model framework. *Robotics and Computer-Integrated Manufacturing*, *50*, 30-36, doi.org/10.1016/j.rcim.2015.09.007

Panayiotou, N.A., Gayialis, S.P., Evangelopoulos, N.P., & Katimertzoglou, P.K. (2015). A business process modeling-enabled requirement engineering framework for ERP implementation. *Business Process Management Journal*, *21*(3), 628-664, doi.org/10.1108/BPMJ-06-2014-0051

Parthasarathy, S., & Daneva, M. (2014). Customer requirements-based ERP customization using AHP technique. *Business Process Management Journal*, *20*(5), 730-751, doi.org/10.1108/BPMJ-04-2013-0044.

Park, J.H., Suh, H.J., & Yang, H.D. (2007). Perceived Absorptive Capacity of Individual Users in Performance of Enterprise Resources Planning (ERP) Usage: The Case for Korean Firms. *Information & Management*, 44, 300-312.

Ram, J., & Corkindale, D. (2014). How "critical" are the critical success factors (CSFs)?: Examining the role of CSFs for ERP. *Business Process Management Journal*, *20*(1), 151-174, doi.org/10.1108/BPMJ-11-2012-0127

Ruivo, P., Johansson, B., Sarker, S., & Oliveira, T. (2020). The relationship between ERP capabilities, use, and value. *Computers in Industry*, *117*, 103209, doi.org/10.1016/j.compind.2020.103209

Sharma, S., & Daniel, E.M. (2016). Isomorphic factors in the adoption of ERP by Indian medium-sized firms. *Journal of Enterprise Information Management*, 29(6), 798-821, doi.org/10.1108/JEIM-07-2014-0076

Siagian, H., Jade, K., & Tarigan, Z.J.H. (2020). The role of affective leadership in improving firm performance through the integrated internal system and external integration FMCG Industry. *International Journal of Data and Network Science, 4*(4) 365–372, doi: 10.5267/j.ijdns.2020.9.002.

Tarigan, Z.J.H., Lianto, & Basana, S.R. (2019). The impact of organizational commitment on upgrading erp for maintaining the quality of information and the ERP performance. *IOP Conf. Ser. Materials Science and Engineering*, 473, 012051, doi:10.1088/1757-899X/473/1/012051

Tarigan, Z.J.H., Jiputra, J.A., & Siagian, H. (2021a). The effect of supply chain practices on retailer performance with information technology as moderating variable. *International Journal of Data and Network Science, 5*(1), 47–54, DOI: 10.5267/j.ijdns.2020.11.003

Tarigan, J.H.T., Mochtar, J., Basana, S.R. & Siagian, H. (2021b). The effect of competency management on organizational performance through supply chain integration and quality. *Uncertain Supply Chain Management*, 9(2),283-294, DOI: 10.5267/j.uscm.2021.3.004

Tarigan, Z.J.H., Siagian, H., & Jie, F. (2021c). Impact of enhanced Enterprise Resource Planning (ERP) on firm performance through green supply chain management. *Sustainability*, 13, 4358, doi.org/10.3390/su13084358

Tarigan, Z.J.H., Siagian,H., & Pirmanta. (2020). The impact of implementing enterprise resources planning (ERP) project on firm performance and organizational citizenship behavior as a moderating. *Journal of Project Management*, 5, 227–236, doi: 10.5267/j.jpm.2020.8.001

Tarigan, Z.J.H., Basana, S.R., & Suprapto, W. (2018). Enterprise Resources Planning Project Manager Competency on Improving Organizational Performance through Process Design and Quality Performance. *ICEBT 2018: Proceedings of the 2nd International Conference on E-Education, E-Business and E-Technology*, 153–157, doi.org/10.1145/3241748.3241777

Wu, J.H., & Wang, Y. M. (2007). Measuring ERP success: The key-users "Viewpoint of the ERP to Produce a Viable IS in the Organization. *Computer in Human Behavior,* 23, 1582 – 1596, doi.org/10.1016/j.chb.2005.07.005

16. Key user ERP capability maintaining ERP sustainability through effective design of business process and integration data management

ORIGINALITY REPORT

6%	3%	1%	3%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	repository.petra.ac.id Internet Source	2%
2	Submitted to Monash University Student Paper	1%
3	Submitted to Central Queensland University Student Paper	1%
4	tailieu.vn Internet Source	1%
5	www.ijstr.org Internet Source	1%

Exclude quotes	On	Exclude matches	< 1%
Exclude bibliography	On		