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IMPACT OF ENTERPRISE RESOURCE PLANNING (ERP) IMPLEMENTATION ON PERFORMANCE OF AN EDUCATION ENTERPRISE: A STRUCTURAL EQUATION MODELING (SEM)

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Abstract:

This study focused on to examine whether the implementation of Enterprise Resource Planning (ERP) in a Peruvian education enterprise impacts on process management of enterprise which in turn enhance the performance of employees. Also, it is analyzed the impact of technology literacy on process management. Empirical data were collected using a survey questionnaire which was distributed to 142 ERP users in a Peruvian education enterprise to test the relationships among variables. Using Partial Least Squares Structural Equation Modeling (PLS-SEM) was analyzed the validity of construct and discriminant and, internal consistency by the composite reliability. ERP implementation has a positive impact in the performance of employees. The process management had a mediation effect between ERP implementation and performance. Also, technology literacy had an impact on performance. Outcomes provide further support for the validity of the model in Peru and globally. Thus, business owner/managers can use the model to help improve their options of success. Other stakeholders, investors and institutions that provide them with investment can also benefit from this model. The information also provides information to ERP implementation agents to support small business development. This is the first study reports the mediating effect of business strategy and organizational capabilities on the relationship between ERP implementation and firm performance. The outcomes of this study can be used to evaluate success of the ERP implementation evaluating preliminary the basic level of technology literacy.

Key words: *ERP, implementation, SEM PLS, Peru, performance*

1. Introduction

Many institutions have grown both economically and administratively; however, having more than one location of activities or different shifts can generate that the

information cannot be efficiently controlled. In this way, with the increase of personnel, of more business units, of export / import of products and services, manual control becomes impossible but even non-interconnected computer systems do not allow efficient management. In order to face this difficulty, several companies in started the use of enterprise resource planning (ERP) systems. ERP is a valuable tool to homogenize processes and also be able to integrate processes throughout an organization. The ERP management systems appeared with the goal of simplifying a system that could con all the departments or operational areas of an organization, such as production, finance, sales, purchases, R & D, etc. Before the appearance in the market of these ERP systems the usual thing was to have an independent software for each department, which also used to be made to measure, which generated several problems, especially in the interconnection of data, which made integration impossible of the information, having lost time and money due to the situation of islands or satellites of information without possible connection.

Thus, an ERP, for example, allows a purchase request to be entered into the system and walk through the system to be viewed by the sales area, in order to generate the dispatch order and the respective invoice, subsequently passing to the accounting area and at the same time to the warehouse area to physically have the requested product. What seems so logical and fundamental at present is a revolution in the organizations of Latin America and Peru. The authors can attest to how 15 years ago in countries like the United States, the health system had already interconnected hospitals for the entry of patients according to their ID, information that was available to the doctor during the medical appointment and at the same time available in the community pharmacy near the patient's home; in other words: an integrated system that allowed ensuring the traceability of the patient's care. Now, these models are based on an ERP, the same ones that have characteristics that make them solid, such as being able to function in international environments such as having the possibility to register different types of currencies, different tax issues, legislations, etc.

There are different types of organizations that need ERP systems but have different characteristics, which require a customization. Thus, the ERP that allows managing a university that offers access to administrative staff, teachers and students will not be similar to the ERP that needs a chain of supermarkets where there are many distant points of entry but customers do not access the system directly or modify data. This evolution of the supply has generated that the ERP increasingly are demanded by diverse types of organizations. An intuitive way to organize the information in the ERP has been to generate a structure based on modules, making each module have the information of each area or department: warehouses, billing, etc. At the educational level, the ERP also start with the financial module, where the enrolment and other student payments as well as the teachers' fees are settled. From this primary financial module, the other modules are linked.

Main modules that constitute an ERP system are:

Procurement module

This module includes the management of materials and the relationship with suppliers. In the system must have the necessary data for the treatment of materials throughout the

entire logistics chain, transactions made with them, simplifying the control of stocks, generate new orders, record the compliance of products received, etc. In addition, the system must provide all the information about prices and delivery conditions, historical purchase information, times, availability, etc., optimizing the purchasing decision-making process. Including more analysis, the system can perform an assessment of suppliers: compliance with delivery times, quality and condition of materials, etc.

Production module
This module is responsible for managing the materials and services used in the production chain of an organization and also the resources (personnel, machines, etc.) used in the activities; In addition, it simplifies the process of planning the materials and the capabilities of the resources. Its integration with the supply module is crucial for its efficiency.

Sales module
This module ensures the relationship of the organization with customers, supporting pre-sales and after-sales commercial activities. Also, it allows the management of orders, distribution, deliveries, and returns. For its successful operation, the sales module must be integrated with the warehouse modules, logistics, and financial module.

Finance module
This module allows the management of accounting and organizational financial management, being a central part of the entire system, providing flexible tools and oriented to financial accounting and cost accounting.

Human resources module
This module allows managing the information of the employees of the organization, which is usually abundant and that usually is not efficiently controlled when there is no implementation of the system. An example of this is the case of the control of vacation days, payments for on time, the request for mobility or food for staff in on time, etc.

Maintenance management module
This module helps control the material and technical resources of the organization, machinery, transport elements and spare parts; in addition, the inventory of all material resources.

Even when ERP have clear differences between them, they have certain common characteristics.

1.1. General characteristics of an ERP

Flexible user interface

Frequently, ERP have recent technologies in relation to the user interface and also, the possibility of access from different access devices. A key element is that ERP systems also allow Web interfaces, which allows access from the company's extranet,

allowing the entry of information from the workers' home or from other remote offices to the organization's central office.

Parameterization capacity

Parameterization is the most relevant functionality of the ERP, since it allows the system to adapt to the specific needs of each organization and, in addition, to incorporate new functions according to the organizational need, without needing specific developments. The success of the parameterization depends on a significant prior consulting effort, which allows the correct mapping of activities and planning of implementation activities.

What is required to parameterize?

- Tax structure.
- Location at the country level, considering different currencies, taxes, schedules, languages)
- Policies of prices, profits, marketing, etc.
- Physical structure, which allows the differentiation of warehouse sites, delivery sites, etc.
- Structure of functions, to define the users, roles and profiles and the accessible functions.
- Process flow, task automation and alert management.
- Documentary structure and records of the organization.

Integration with other applications and ability to access information

This feature allows the communication and exchange of data through standardized interfaces. The system has a set of predefined outputs and reports that allow interaction from different data access tools.

In the market, there are different options to implement an ERP and there are different ways that organizations evaluate the convenience of buying a certain system. Thus, there are general guidelines for the selection of an ERP system.

1.2. Criteria for the selection of an ERP system

Technical criteria

Involves the technical platforms supported by the ERP, databases used, embedded programming languages, development tools, ease of communication with other systems and applications, mainly.

Economic criteria

Composed of the costs of the licenses, implementation process associated consulting services, as well as the subsequent revisions and updates. This is a key aspect because the implementation requires continuous work on time and we must be certain that the cost on time will increase and cannot be avoided.

Functionality of the ERP

It is possible that the ERP has certain gaps that require you to complete with other products or be required to develop to the extent of the organization. Ideally, the complementary modules should be the least possible.

Organizational criteria

Evaluation of the impact and changes in the processes and, organization necessary for the correct implementation of the ERP. Any implementation of an ERP leads

to changes in the processes, such as having SOP for all the processes that are carried out, generating the induction of these SOPs. There are some ERP that may require more changes or previous implementations which may make implementation more expensive or delay it.

Ease of use

Both for those who feed the data and for the users of them. Here, a concept that is little described in the literature as a key aspect for the external user is important: technological literacy.

Trust in suppliers

Problems have been reported in many organizations when cost has been the main criterion to choose the actors that will participate in the implementation, going from companies with little technological resources or consultants with little experience in the implementation.

The selection process will involve the following:

Establish the scope of the project

This internal phase involves the evaluation that is carried out to establish what the expectations are from the areas. Many times this step is not carried out and the involved areas do not know about the process until it is already in operation. Each area must express its main problems in the information process. In this diagnostic process, the support of an external company may be needed to facilitate this diagnosis and the determination of needs, expectations and proposals from the areas involved.

Identify the candidate companies

In this phase the suppliers need to be supplied with the offer to implement an ERP. After that, the received proposals will be received for evaluation, taking into account the aforementioned criteria for the evaluation of the proposals, it is taken into account both the information received and the history of the company in previous implementations, if possible and also, the information presented in the Web page.

Interview and request demonstration of the candidates

For this activity, it is necessary to have an instrument that allows scoring the candidates, according to certain criteria. This tool helps the selection of candidates are really taking into account specific criteria, with specific weights and scores of several evaluators. A common mistake is in this phase where participation is usually by management or only some areas, omitting the opinion. A committee that ensures the participation of all areas can be useful. In this way, ERP systems support organizations so that they can optimally perform information control and improve administrative processes to efficiently do so (Lam et al. (2016). The success of the implementation and long-term operation of ERP systems are essential to improve the performance, profitability and growth of the organization (Galy, 2014).

2. Literature Review

ERP is increasingly achieving an important position in companies to integrate the luxury of administrative, commercial, financial, human resources and technological content (Aladwani, 2001). ERP News (2017) reported the TOP 10 ranking of ERP companies. About market share, statistics shows SAP HANA (20.3%), Oracle (13.9%) and Microsoft Dynamics 365 (9.4%). In relation to implementation time, Oracle is the fastest with 25 months, followed by Info CloudSuite with 30 months and SAP HANA with 34 months. Based on implementation costs, estimated from the percentage of revenues, NetSuite has 2.8%, IQMS 2.9% and IFS 4.0%. Taking into account the ERP System Functional Score (scale of 5), the first three positions are IFS 3.6, Oracle (3.33) and Epicor (3.2). Finally, evaluating the Time to Realize Business Benefits (months), the 3 ERP that lead the market are SAP HANA (8.5), Epicor (8.6) and NetSuite (8.7). Several studies have claimed that ERP systems can increase competitive advantage in the information technology (IT) era (Lengnick-Hall et al., 2004; Lengnick-Hall & Lengnick-Hall, 2006). Currently, taking into account that many of the commercial activities of companies are based on e-business, there is a general tendency to integrate the processes of an organization through ERP (Hsu, 2013).

There are different types of potential benefits of ERP implementation. That way you have: Customer related costs (Jussila et al., 2014; Ranjan et al., 2017), operational costs (Huang & Handfield, 2015), reducing time in marketing (Ghoushchi et al., 2013), productivity of staff (Eid et al., 2017), knowledge of process (Ranjan et al., 2017), intra-organizational communication (Huang & Handfield, 2015), innovation (Maas et al., 2016) and data control (Chang et al., 2014); however, despite this proposed solution when the ERP is implemented in an organization, (Xue et al., 2005) reported that there were reasons why the implementation in China had failed, mentioning aspects such as language, reporting and tabulation of the physical data that feed the system, the necessary reengineering in the processes of the organization, the economic impact of the reform, problems with the human resources.

ERP implementation failure

Although the implementation can generate various benefits for companies, there have been recent cases in which there have been errors in the implementation of ERP in organizations of various sectors. Below we present some representative cases of these failures.

The Vodafone company had problems consolidating its systems on the Siebel platform: a part of the clients' accounts that were not properly migrated; however, customers noticed that their accounts were not credited correctly for payments made. This resulted in a fine of £4.6 million pounds sterling by the British newspaper Ofcom and all the loss of prestige as a result of what happened (BBC, 2016). The case of the Washington Community University in the United States is more complicated as its students were paying part of their tuition each year to help schools upgrade to an ERP system called PeopleSoft, which was expected to be released in the 2012; however, the project could not be

completed, since the 34 campuses of the system had very varied commercial processes that had to be standardized, which was not clear until well advanced. Currently the project continues truncated (Spokeman, 2016)

The Australian department store Woolworth, created more than 90 years ago, faced a problem when making the transition to a system built 30 years ago in SAP. One of the main problems was that the stores' profit and loss reports, which the managers were used to receiving each week, could not be generated for almost 18 months. The problem was in the change in the data collection procedures but the main cause was that the company did not fully understand its own processes, that is, the procedures were not documented and with the rotation of the staff throughout the time that the project lasted implementation that know-how was lost (Computerworld, 2016). In order to face this difficulty, several companies in Peru started the use of enterprise resource planning (ERP) systems, with Peru being one of the 5 countries in Latin America that most demand the implementation of ERP since they want to generate a competitive advantage long term (Gestión, 2017). Of the 34 existing public companies at least 17, the largest, already use world-class software, while among the ministries still have the vast majority using computer programs made "in house" i.e. developed own (ElComercio, 2017).

2.1. Research model

The commercial value of information technology (IT) has already been described in the academic literature as the case of Tallon et al. (2000) and Ryssel (2004). Wang et al. (2007) and Wieder (2006) argue that information technologies generate commercial value by improving business processes. Igbaria & Tan (1997), Sircar et al. (2000) and Prajogo & Olhager (2012) have proposed that IT improves the performance of the company by creating efficient solutions. Fink & Neumann (2009), Chanopas et al. (2006) and Celuch et al. (2007) also indicate that the value of IT is in being able to generate greater flexibility and influence the competitiveness of the company. Simon & Hitt (2009) mentioned that an organization can increase its investments in information technologies through the development of its internal capabilities with this information technology, which will allow greater investments. Gouvea, Kapelianis & Kassicieh (2017) found that information technology allows the development and sustainability of organizations, although more research is necessary to establish this influence in a precise way.

Organizations have historically been investing large sums of money in information technology (IT); always trusting that such investment may have benefits in the medium or long term. In that sense, Weill (1992) described the results of the evaluation of the performance effects of IT investment in the manufacturing sector. Historical data of 6 years on investment and IT performance were obtained from 33 manufacturing companies. The investment was categorized by management objective (strategic, informational and transactional) versus four measures of performance (sales growth, asset performance and two measures of labor productivity), finding that the intensive use of transactional IT investment was associated significantly with a solid performance; In addition, it was found that the constant use of strategic ITs did not generate long-term changes and was

associated with low performance in the short term, which allows us to affirm that the initial benefits of the implementation of strategic IT on time declines and it ceases to be a competitive advantage. It is concluded that although there is a relationship between the implementation of IT and performance through the improvement of processes, the dimension on which the implementation is located depends very much. Finally, the IT impact on the company's performance is the same result of the interaction between IT and business processes. Since the 90s there has been a concern about the lack of control of processes in various organizations, such as health systems in which there is a constant increase in costs, which has made it convenient to use health technologies information, such as the case of ERP. In that sense, Lun (1995), describes that having the right infrastructure, health organizations can improve the availability of information and ultimately generate significant savings in operating costs; also, Mitra and Chaya (1996) analyzed the information of 400 companies to establish a relationship between IT investment and operating costs, finding that a greater investment in IT was generally associated with lower operating and production costs. Both studies, allows affirming that the impact of the implementation of IT, such as ERP, through a mediation effect in the processes, generates an impact on the performance of the organization.

Sambamurthy et al. (2003) points out that the capacity of process management involves carrying out processes in an optimal way to adequately guide manufacturing, the supply chain, finance and marketing mainly. This shows, as Wu (2011) points out, that the process management capacity mediates the relationship between IT and performance; In addition, Hung (2006) points out that process management is a source of competitive advantage.

Information technology need of a reengineering process to be efficient. Attaran (2004) describes the actions to be carried out before the design of the process, during the design of the process and during the implementation. Before designing the process, it is mainly necessary to identify the infrastructure and information management that will support the organization, identify and select the redesign processes and train the IT staff in non-technical aspects such as marketing, relationship with customers, etc. In the same way, during the design of the process, a large amount of information must be had, improve the capacity of employees to make more informed decisions in a more independent way, obtain and disseminate knowledge to improve the process, transform processes not structured in standardized operating processes, measure the performance of the current process and establish performance goals. Finally, during the implementation it is necessary to improve the IT processes to meet the new needs, communicate the results and evaluate the potential investment. In current study, we specifically examine the effect of an ERP implementation, through process management on performance. Also is analyzed the effect of technology literacy on process management.

We aimed to provide answers these questions in this research:

1. What is the influence of ERP implementation (ERPI) on Process Management (PM)?
2. What is the influence of Technology Literacy (TL) on Process Management (PM)?
3. What is the influence of Process Management (PM) on Performance (P)?

Research model is described in Figure 1

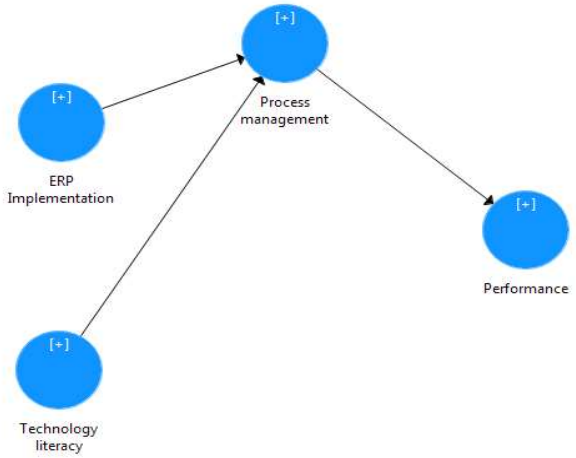


Figure 1. Research model

3. Research methods

3.1. Data Instrument

Information is collected using a questionnaire: age, sex, if take Office courses in last five years, if take Internet courses in last five years and if use an ERP previously. Also, using a questionnaire using Likert scale is obtained the information about ERP implementation, business process, performance and technology literacy. Items of the

Likert scale are:

ERP implementation

1. The use of SAP is simple
2. The help presented by SAP is useful
3. SAP information is presented clearly and understandably
4. The organization of SAP menus is logical
5. Learning to use the new functionalities of the SAP is easy
6. The SAP has met my expectations
7. The information offered by the SAP is sufficient to carry out my activities

Process management

8. I have an efficient training to use the SAP
9. I have the support readily available to make my queries about the SAP.
10. I have information about the standardized operating procedure to use the SAP
11. I have clear where to turn when there is an error or difficulty with the SAP
12. They communicate to me in time the deadlines for the entry of the information to the SP.

Performance

13. I consider that my performance has increased after the SAP implementation

14. I believe that the SAP has managed to meet the objectives and goals of the company.
15. When they ask me to finish a task using the SAP, I do it without errors.
16. The SAP allows me to perform my tasks completely and correctly in the indicated time.
17. The SAP allows me to develop my work satisfactorily.
18. I adapted easily to the use of SAP

Technology literacy

19. I often read the messages I receive in my institutional email from my mobile phone or tablet
20. I respond frequently to the messages I receive in my institutional email from my mobile phone or tablet
21. I easily download information from my mobile phone or tablet
22. I consider myself an intermediate-high level user of Office (Word, Excel)
23. I consider myself an intermediate-high user of the Windows environment

Sample

For current study were employed both open-ended and closed-ended. Workers from a Peruvian education enterprise were sampled. Data was collected between 02 September and 11 October 2017. A total of 155 workers participated and completed the survey. Only 142 students completed the survey properly.

Validation with SEM-PLS

Using Partial Least Squares Structural Equation Modeling (PLS-SEM) was analyzed the validity of construct and discriminant and, internal consistency by the composite reliability. SmartPLS statistical package (Ringle, Wende & Becker, 2015) is used to calculate the factorial structure of the indicators, using Partial Least Squares. SEM-PLS aims to predict the latent variables by estimating Partial Least Squares (PLS) and Principal Component Analysis (PCA). The main advantage of PLS is the greatest strength calculations to smaller samples and breach of statistical assumptions of the variables (non-normal distribution, different levels of measurement, multicollinearity, among others).

With PLS structural equation modeling technique can be evaluated simultaneously two methods: the measurement model and the structural model. In the case of validity, the measurement model is used which involves the analysis of the reliability of each indicator, the internal consistency of each dimension, analysis of average variance extracted and discriminant validity. In a PLS model, the individual reliability of the indicators is assessed by examining the load between each indicator and dimension, accepting as reliable those above 0.706 loads, although some authors suggest not be so rigid in early stages of development instruments. Another measure used to evaluate the fit of the model is the average variance extracted that provides the amount of variance that a construct (dimension) obtains from its indicators about the error variance. A good fit requires values above 50%.

Validation of construct of performance with SEM-PLS

Table 1 shows that all the factor weights of the dimensions of the performance are majority greater than the expected minimum (0.706), with average variance extracted by

scale between 54.5 and 60.4%, and high levels of composite reliability (between .765 and .811). These values confirm the internal consistency and construct validity of each of the subscales of performance.

Table 1. Construct validity of the items of the scales of employee performance using Structural Equations of Variance using Partial Least Squares

	Items	Loading	Composite reliability	Extracted variance
ERP implementation	The use of SAP is simple	**.755**	**.811**	**.595**
	The help presented by SAP is useful	**.698**		
	SAP information is presented clearly and understandably	**.782**		
	The organization of SAP menus is logical	**.683**		
	Learning to use the new functionalities of the SAP is easy	**.819**		
	The SAP has met my expectations	**.839**		
	The information offered by the SAP is sufficient to carry out my activities	**.812**		
Process management	I have an efficient training to use the SAP	**.543**	**.802**	**.604**
	I have the support readily available to make my queries about the SAP	**.491**		
	I have information about the standardized operating procedure to use the SAP	**.853**		
	I have clear where to turn when there is an error or difficulty with the SAP	**.671**		
	The chairs communicate to me in time the deadlines for the entry of the information to the SAP	**.716**		
Performance	I consider that my performance has increased after the SAP implementation	**.814**	**.795**	**.545**
	I believe that the SAP has managed to meet the objectives and goals of the company	**.776**		
	When they ask me to finish a task using the SAP, I do it without errors	**.717**		
	The SAP allows me to perform my tasks completely and correctly in the indicated time	**.856**		
	The SAP allows me to develop my work satisfactorily	**.885**		
	I adapted easily to the use of SAP	**.576**		
Technology literacy	I often read the messages I receive in my institutional email from my mobile phone or tablet	**.449**	**.765**	**.576**
	I respond frequently to the messages I receive in my institutional email from my mobile phone or tablet	**.420**		
	I consider myself an intermediate-high level user of Office (Word, Excel)	**.925**		
	I consider myself an intermediate-high user of the Windows environment	**.818**		

Source: 142 education enterprise workers. Self-prepared

4. Findings and Discussion

As seen in Table 2, age, sex, career, academic degree, if take Office courses in last five years, if take Internet courses in last five years and if use an ERP previously.

Table 2. Demographic characteristic of respondents

Gender	N	Mean age	Range age	Office courses	Internet courses	Previous use of an ERP
Female	57	36.28 (SD: 8.77)	21 - 53	Yes=33 No=24	Yes=30 No=27	Yes=0 No=57
Male	85	33.87 (SD: 7.65)	21 – 49	Yes=33 No=24	Yes=30 No=27	Yes=0 No=57

Source: 142 education enterprise workers. Self-prepared

Also, the Figure 2 show the research model tested

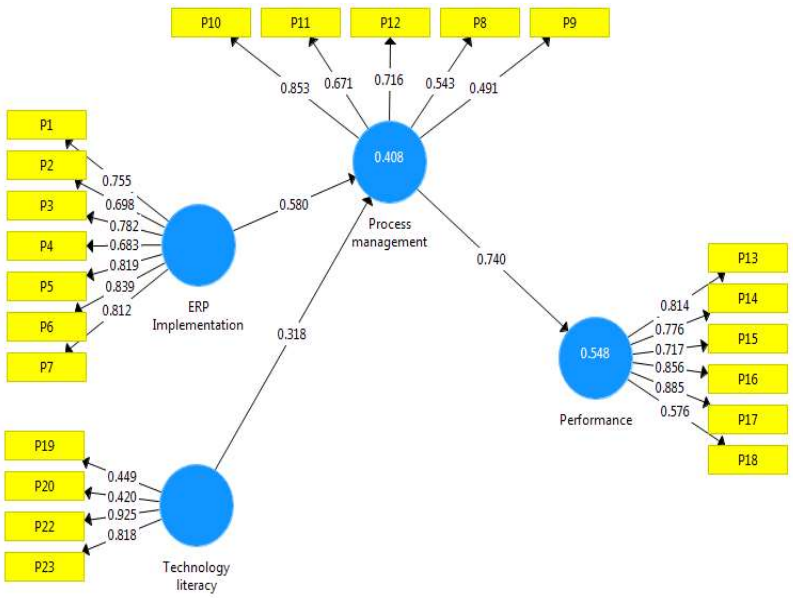


Figure 2. Factorial composition of the dimensions of performance

Considering the relation showed in figure 2, we evaluated the objectives 1, 2 and, 3:

The influence of ERP implementation (ERPI) on Process Management (PM)
The ERPI has a positive influence of 0.580 on PM.

The influence of Technology Literacy (TL) on Process Management (PM)
The TL has a positive influence of 0.318 on PM.

The ERPI together with TL explains 40.8% of the PM.
The influence of Process Management (PM) on Performance (P)
The PM has a positive influence .740 on P.
The PM explains 54.8% of the P.

Table 3 shows the significance of the path coefficients between the variables. It is included outcomes of bootstrapping with 5000 resample. It is verified that all values are significant.

Table 3. Significance of the path coefficients between the variables.

Relations between variables (Beta values)	Original sample	Sample mean	Standard error	T statistical
ERPI → P	0.429	0.437	0.063	6.836
ERPI → PM	0.580	0.582	0.059	9.742
PM → P	0.740	0.749	0.043	17.202
TL → P	0.236	0.222	0.096	2.445
TL→ PM	0.318	0.298	0.132	2.417

Source: Simulation through Bootstrapping. Resample (5000 times), $p<0.01$
Note: ERP Implementation (ERPI), Process Management (PM), Technology Literacy (TL), Performance (P).

Our outcomes suggest that ERP can create impact on performance only through of optimization of processes management. This is consistent with the argument by Wang et al. (2007) and Wieder (2006) that argued that IT create commercial value by improving business processes and also according to Igbaria & Tan (1997), Sircar et al. (2000) and Prajogo & Olhager (2012) that have proposed that IT improves the performance of the firm by creating efficient solutions to usual problems.

This study is especially important for developing and emerging countries such as like Peru, in which the implementation of ERP is growing more and more in public and private organizations, even more important because is being one of the 5 countries in Latin America that most demand the implementation of ERP (Gestión, 2017). It was relevant to find that about 40% of the workers did not have formal training to use the Microsoft Office and about 50% did not have a formal training on the use of the Internet, which may also explain the difficulties during the process of implementing the ERP, since a large number of people have difficulties and technological limitations. This is striking since the surveyed workers have an administrative job which leads to the use of technological environments on a daily basis but it is evident that in spite of them their degree of literacy in the middle is low.

The present research has two main implications:

Theoretical model. Many previous studies analyzed different variables to evaluate their influence on performance but one different issue in current study is the integration of technology literacy which can explain why ERP implementation can be slow or even can be failure; also, to verify the importance of technology literacy can offer the opportunity to

enterprises to understand better the process and include one step more in the implementation process: increasing the basic technology literacy between their employees.

Future research. Outcomes of current study offer information to understand usual variables that impact on performance. Using this basic model, future studies will include more variables. Authors suggest specifically for future research establish a comparison in a same company between employees who received ad hoc technology training for ERP implementation against other employees who don't receive it, in order to test the real impact of technology literacy. Also, future research must include moderation influence as years of work in the company, type of career and salary.

A major limitation of the current study is that the data were solely from one enterprise of Lima, Peru. This issue may reduce the generalizability of the outcomes regarding other developing countries, due to their different characteristics. Future studies must be developed in other countries in the region in order to compare the level of impact on performance of the variables studied and discon what other can be important in other places or can be useful for one specific sector. For next study, will be useful to test the instrument used in this study in order to increase any items that can be describe better the variables and their influence on performance.

5. Conclusion

One practice implication of current research is that the implementation of ERP can improve the performance but depend of improve of process management. In this way, the criteria for choosing the ERP have been diverse and although all the ERP basically offer a lot of ease for users in friendly environments, there is a need to work previously in the design of standardized operating procedures of the main activities and also the evaluation of the implementation process that will always have resistance at the beginning by the users and that precisely at this stage is where the main difficulties encountered must be measured but also be able to detect what are the individual technological gaps in the workers to be able to develop those competencies in the short term and thus improve the use of the ERP.

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