

An ERP System for smes in Latin America: Literature review

*Un sistema ERP para las pyme en América Latina:
Revisión de literatura*

*Um sistema ERP para PMEs na América Latina:
Revisão da literatura*

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Abstract

Introduction: This article is supported by the research and bibliographic review carried out during February and April 2020 in the Industrial Engineering program of the Fundación Universitaria de Popayán C.

Problem: Small and Medium-sized Enterprises (SMEs) are faced with various challenges, to the extent that they do not have technological systems that allow them to administer and manage the information that each area can generate in a timely and practical manner, preventing them from effectively planning for the future.

Objective: The Bibliographic review aims to establish what type of ERP system would serve SMEs in Latin America, so that they can be combined with the organization's strategies, seeking to optimize and improve production processes.

Methodology: The bibliographic review was carried out applying Kitchenham's guidelines, which proposes three fundamental stages: (1) planning the review, (2) development of the review, and (3) publication of the review results.

Results: For SMEs, cloud-managed openERPs represent a viable option, since implementation costs are significantly reduced, as well as the issue of maintenance and technical support.

Conclusion: OpenERP systems managed in the cloud represent the most feasible option, due to costs, practicality, flexibility and lower operational requirements when implementing the implementation of the system.

Originality: The implementation of the ERP system in SMEs is an issue that has been addressed by several authors, but in this case the study was intended to cover a much larger context such as Latin America.

Limitations: The amount of information on the implementation of ERP systems in both large and small companies in Latin America is very limited.

Keywords: ERP, SMEs, digital transformation, information technology (IT).

Resumen

Introducción: Este artículo está soportado en la investigación y revisión bibliográfica realizada durante febrero y abril 2020 en el programa de Ingeniería Industrial de la Fundación Universitaria de Popayán C.

Problema: Las PYMES se ven enfrentadas a diversos retos, en la medida que no cuentan con sistemas tecnológicos que les permitan administrar y gestionar de manera oportuna y práctica la información que pueda generar cada área, de tal manera que les sirva para planear a futuro.

Objetivo: La revisión bibliográfica tiene como objetivo establecer qué tipo de sistema ERP le serviría a las PYMES de América latina, de tal manera que puedan conjugarse con las estrategias de la organización, en busca de optimizar y mejorar los procesos productivos.

Metodología: Se hizo la revisión bibliográfica aplicando las pautas de Kitchenham, que propone tres etapas fundamentales: (1) planificación de la revisión, (2) desarrollo de la revisión y (3) publicación de los resultados de revisión.

Resultados: Para las PYMES, los openERP gestionados por la nube representan una opción viable, debido a que los costos de implementación se reducen significativamente, así como el tema concerniente al mantenimiento y soporte técnico.

Conclusión: Los sistemas openERP gestionados en la nube, representan la opción más factible, por un tema de costos, practicidad, flexibilidad y menores exigencias operativas a la hora de realizar la implementación del sistema.

Originalidad: La implementación de sistema ERP en PYMES es un tema que ha sido abordado por varios autores, pero en este caso se quiso realizar el estudio abarcando un contexto mucho más grande como lo es América Latina.

Limitaciones: La cantidad de información sobre la implementación de sistemas ERP tanto en grandes como en pequeñas empresas en América Latina es muy limitada.

Palabras clave: ERP, PYMES, transformación digital, tecnologías de la información (TI).

Resumo

Introdução: Este artigo é apoiado pela pesquisa e revisão bibliográfica realizada durante os meses de fevereiro e abril de 2020 no programa de Engenharia Industrial da Fundación Universitaria de Popayán C. **Problema:** as PMEs enfrentam vários desafios, na medida em que não dispõem de sistemas tecnológicos que lhes permitam administrar e gerir de forma atempada e prática a informação que cada área pode gerar, de forma a ajudá-las a planear para o futuro.

Objetivo: A revisão bibliográfica visa estabelecer que tipo de sistema ERP seria útil para as PMEs da América Latina, de forma que possam ser combinados com as estratégias da organização, na busca de otimizar e melhorar os processos produtivos..

Metodologia: A revisão bibliográfica foi realizada aplicando-se as diretrizes de Kitchenham, que propõe três etapas fundamentais: (1) planejamento da revisão, (2) desenvolvimento da revisão e (3) publicação dos resultados da revisão.

Resultados: Para PMEs, openERPs gerenciados em nuvem representam uma opção viável, pois os custos de implementação são significativamente reduzidos, bem como problemas de manutenção e suporte técnico. **Conclusão:** Os sistemas OpenERP gerenciados na nuvem representam a opção mais viável, devido aos custos, praticidade, flexibilidade e menores demandas operacionais na implantação do sistema. **Originalidade:** A implementação do sistema ERP em PMEs é um tema que tem sido abordado por vários autores, mas neste caso o estudo foi realizado abrangendo um contexto muito maior como é o da América Latina.

Limitações: A quantidade de informações sobre a implementação de sistemas ERP em grandes e pequenas empresas na América Latina é muito limitada.

Palavras-chave: ERP, PMEs, transformação digital, tecnologia da informação (TI).

1. INTRODUCTION

For decades the world has been experiencing great changes in the geopolitical, educational, technological and economic spheres, which undoubtedly contribute to the growth and development of a region, at the same time that they generate conditions and spaces for the emergence of new organizations, as well as the expansion of those that already exist [1].

The dynamism that occurs in the economic sphere and in world trade, added to technological advances, is modifying consumption patterns to the extent that they are becoming more demanding in the types of products and services they seek [2]. Consequently, the industrial sector is addressing these changes by embracing the

concept of "Industries 4.0". This concept includes: Big data, augmented reality and robotics, among others [3].

The Sustainable Development Goals and the 2030 Agenda represent a challenge, but also a path of opportunities, so that Latin American countries can transform their development model under a broad vision, which aims at economic, social and environmental sustainability [4], and without a doubt, Small and Medium-sized Enterprises (SMEs) cannot be relegated from such an important transformation process [5].

In theory, SMEs can be considered as small productive units, recognized for their flexibility and adaptability to changes in the markets [6]. Given the key role they play in the economy, they constitute an extremely important business structure for the development of most countries or regions where they are located [7], especially in generating employment, reducing informality, creating opportunities and contributing to the growth of the Gross Domestic Product (GDP), which can be equal to or even greater than that of the large companies [8].

The globalization of markets and the economy is a call to companies that offer goods and services to build that factor that differentiates them from the competition, making use of all available resources [9], such as Information Technologies (IT), which allow optimizing and improving production processes [10]. Under this premise, it is recommended for SMEs to use an Enterprise Resource Planning (ERP) system, which is a form of business software that facilitates resource planning and information management in a company [11]. It is in the management and treatment of information that a weak point has been identified in the majority of family SMEs, to the extent that there are no tools or standardized method of data collection [12][13].

ERP systems are generally hosted in three ways: traditional (on-premises) in the cloud, or a combination of the two. ERP systems in the cloud maintain the main functions and characteristics of the traditional ones with a marked difference in the type of technological infrastructure to be used and the cost [14].

This article seeks to offer a general overview of the benefits that an ERP system can offer to SMEs in Latin America and its construction is based on the bibliographic review of books, specialized documents, as well as national and international scientific journals and articles consulted in databases such as: Google Scholar, EBSCO, IEEE Xplore and ScienceDirect. It should be noted that the information that was found available in digital and physical media on the implementation of ERP systems in SMEs is very limited, because organizations zealously retain this type of information, often due to business policy and information security.

This document is divided into four sections: The first section provides an introduction to ERP systems and SMEs. The second section relates the methodology applied for the bibliographic search. The third section presents the results of the review of the consulted literature and an analysis of the relevant information is carried out. Finally, the fourth section provides a discussion of the results obtained and the subsequent conclusions.

2. MATERIALS AND METHODS

In this study, Kitchenham guidelines have been used [15], which starts from the literature review in order to accumulate existing knowledge within a domain of interest [16], [17]. This method proposes three fundamental stages: (1) planning the review, (2) developing the review, and (3) publishing the review results [18], [19]. The study carried out during February and April 2020 yielded 100 articles related to the search words: ERP review, ERP system, ERP and SMEs, SME competition, types of ERP. The electronic databases of: Google Scholar, EBSCO, IEEE Xplore and ScienceDirect were consulted. The articles were filtered taking into account a series of criteria, prioritizing those that answered the following questions: (i) What variables are taken into account when implementing an ERP system? (ii) Which ERP systems are the most implemented in SMEs? (iii) In which sector of the economy are SMEs more recurrent in the implementation of ERP systems? and (iv) What type of ERP can be adapted to the needs of an SMEs? Finally, only the articles from 2015 and books from 2016 onwards were taken into account. Based on this filter, 65 articles remained at the end, which were analyzed to construct the bibliographic review.

3. RESULTS

ERP (Enterprise Resource Planning) systems are a business software package configurable to the needs of an organization, that integrates all the sections, areas or departments of the same. ERPs are made up of several independent units called modules that can be parameterized [20]. In 2017, Acosta and his collaborators [21], stated that the first and fundamental are the so-called basic modules that are usually the most used, among these are: production, supply chain management, financial accounting, sales, purchases, inventory and human talent [22]. Without a doubt, the implementation of this computerized administration system facilitates the task of evaluating, controlling and managing the company in an easy and precise way [21],

[22], to the extent that it integrates business processes in a single application, facilitating access to information in real time that is finally used to make decisions in business processes [23].

The classification made below of the ERP systems found in the literature is done by taking into account the most relevant differences of each of the systems, such as: implementation, software development, costs, advantages and benefits.

Classification of ERP systems

Custom ERP

Business management software is built from scratch with user specifications in mind. Although there are savings made due to licensing costs, the time required for its implementation is much longer than in standard ERPs. Its main advantage lies in the adaptability of the system to the needs and business model, facilitating the performance of various tasks, which provides greater stability to the organization [23], [24]. This characteristic is reflected in the measure that unnecessary modules are discarded and only those that are needed are implemented. In SMEs, these systems are usually used under two criteria: (i) when the commercial activity is specific and the other ERP solutions do not adapt to these requirements, and (ii) when a standardized production model is maintained over time that provides advantages over competitors [24].

Although there is no dependency with third parties since it is the same organization that creates and implements the ERP, this type of specialized software grows and updates to the extent that the user determines, otherwise it will not evolve, neither in benefits, nor in the operational or technological part, which greatly limits the incorporation of new functions that offer new tools to users. In this way the update and maintenance of the ERP will be driven by the organization's staff [25] [72] [73].

Predefined or standard ERP

This ERP is not as personalized as the Custom ERP, as it is not developed from scratch; however, this "off-the-shelf" software can fit into different business models. A factor to take into account and that stands out as the main advantage is that, with this type of ERP system, the investment and implementation time is much less than with custom ERPs [26]. Although for this system you must assume the license cost that is paid periodically, knowing that you are working with software that works at full capacity and that it has already been tested by other users provides peace of mind.

Other factors to take into account are that the predefined ERPs have a greater degree of dependence on the supplier, since it is the only one that can update or modify the software [27]. In the same way, since it is a software that has not been designed for a type of business model, it will then be the organization that must adapt its work model, so that it fits with the operation of the ERP system. Likewise, there may be other aspects within the design of the system that are not designed according to the needs and characteristics of the organization [24], [28]. The most common case is that most ERP systems are designed to integrate a large number of modules, which would not be convenient for SMEs, who would have to pay for more modules than are actually required.

Proprietary ERP

In particular, the licenses to use proprietary ERPs represent a significant investment, which restricts access to SMEs [29]. The costs concerning the hardware can be similar to an open-source ERP, but those that have to do with the implementation and adaptation service of the system differ to the extent that it is easier to find specialists and companies dedicated to the implementation of proprietary ERPs, than to the cases that have to do with open-source ERPs [30].

Another factor to take into account is the adaptability of the software to the needs of the user company, and mainly that is the problem that occurs with this type of system, as there is a gap between the functionality of the ERP and the requirements of the company; it is known as a "gap" or mismatch problem. Most proprietary ERPs cannot be substantially modified in the way in which business processes are managed, only some basic customizations such as developing reports, queries, screen displays, among others can be carried out to a certain extent [31].

The users of this type of system are dependent on those who develop and distribute the product, that is, the owner of the code. Generally, they are the ones who fully know the system; so, they will be in charge of making the updates and new requirements. This type of software is generally available for any hardware, facilitating technical support to companies. Additionally, this type of ERP system offers a better finish in both aesthetics and functionality, which means that less specialized technicians are required for its use within the company [32].

Open-source ERP

Open-source ERPs are very popular with SMEs as the software license is free; although not completely free [33]. The associated costs with the installation, learning, and maintenance must be considered [34].

The highlights of this type of ERP system include an improved flexibility and adaptability when compared to proprietary ERPs and this is due to two aspects: (i) open-source ERPs can be modified by the user company and allows for parameterization and software updates to a newer version [35], and (ii) as it is a modular code, several developers can work at the same time and each one is in charge of a section (module), which gives rise to an interface that adapts to the needs of the company, facilitating its use [36].

In terms of hardware, the investment made is similar to that of proprietary systems, but there is a very marked difference in the value of the services necessary for the implementation and adaptation of open ERPs with respect to proprietary ERP [37].

Finally, one of the greatest benefits of the open-source ERP system is that companies have full control over the system and the source code in such a way that they can develop improvements in the software [38], to the extent that both technical and domain information for these types of systems is available online and more knowledge can be obtained from open-source communities. This undoubtedly also creates less dependency on the provider, even with technical and domain expertise, the organization itself can implement the system before considering hiring a provider [39] [67] [68].

Local ERP

ERPs of this type require that the company have an infrastructure such as servers, networks, platforms, computers, etc., available for its implementation; that can take a long time and the administration, operation and maintenance of the system will remain in charge of internal staff [40]. Although it is true that the objectives of ERP systems are aimed at offering multiple benefits, the implementation of these systems can be a costly and complex exercise as it requires a large number of resources that not all companies can afford [41] [69].

Local ERPs have to enhance, reconfigure and update the software to the most current versions provided by the supplier, with internal staff in charge of carrying out these procedures [42]. For this reason, it is common to see that companies using these systems avoid updating their software version and manage the company with outdated technology [43] [70].

ERP in the cloud

The growing transition from local ERP systems to ERP in the cloud reveals a very interesting trend of change which benefits to SMEs [44], since it is not necessary to invest time in installing and testing the infrastructure that supports the ERP system [45]. The development of cloud computing has become an important technological trend that allows access to a network that offers a set of configurable computing services such as infrastructure, applications and storage under the Software as a Service (SAAS) model [46].

So, the combination of ERP with cloud computing helps overcome the cost of the implementation of this type of system, because the use of software, hardware and storage is eliminated or reduced [42]; this being one of the main differences with the local ERP.

ERPs that rely on cloud computing exploit several advantages such as: on-demand service and pay-per-use, which is offered under a subscription model that allows the company to pay for what is actually being used, among others [47]. In this way, the provider will be in charge of managing and providing the user with a server, the software and all the infrastructure necessary to operate, ensuring that the system receives maintenance and the necessary updates, so that this is always available [43], [48], in such a way that the user will dedicate himself to using the service through an internet browser.

It is important to note that with ERP cloud, the information generated in all departments is stored in one place, and can be consulted in real time from anywhere in the world [49]. That is why this type of ERP system not only offers greater accessibility and performance over their local counterpart, but also greater robustness, due to the fact that providers place a high priority over the requirement for the security of their systems against any cyberattack [50].

Finally, ERPs based on cloud technology have emerged as a solution to all the difficulties encountered in the local system. To the extent that they provide flexibility, adaptability and profitability by taking advantage of all the benefits that the network offers [51] [71].

Table 1. Comparison of the general characteristics of Proprietary and Open ERPs.

Description	Proprietary ERP	OpenERP
Personalization	No	Yes
Adaptability and flexibility	Low	High
Provider dependency	High	Support
Software costs (License)	High	Low
Hardware	Yes (When managed in the cloud, this component is reduced).	Yes (When managed in the cloud, this component is reduced).
Implementation of the system	Company that manufactures the ERP.	Organizations dedicated to designing ERP or the company itself.
Modular	Yes	Yes
Medium	Half	High
Cloud management	Half	High

Source: [23], [26], [30], [33], [40] and [44].

To make the comparison of the consulted systems, it was decided to classify the ERPs into two groups, as follows: In the first group would be the proprietary ERPs (Custom, predefined or standard, proprietary and local). In the second group would be the free ERP (Open-source). It should be borne in mind that, although the two ERP groups could be managed in the cloud, it is currently being reported that companies, such as SMEs, choose to use open ERP systems managed in the cloud to reduce costs.

ERP system costs

Espinoza (2015) [52], concludes that it is more convenient to use ERP systems managed in the cloud than traditional ones. This is due to two factors: the costs and the useful life of each of the systems. While a financial accounting module, for example, in the case of the traditional system may have an investment cost for its implementation of \$ 31,804,900 and have a useful life of five years, which after that time would require updates, in the case of ERP systems in the cloud, the investment cost for their implementation would be represented by a cost of \$ 1,382,411. Furthermore, it does not require an update process after a certain period, since it is updated in parallel to technological advances; this undoubtedly represents a cost advantage that SMEs are taking advantage of.

Cando (2015) [53], considers that for SMEs it would be more convenient to implement an ERP system managed in the cloud over the traditional system; for several reasons, including that the investment cost for a service of 100 users is \$ 260,422,300. The other benefits represented are that, when outsourcing the service,

the implementation (software and hardware), updating, and maintenance of the system is the responsibility of the provider. By comparison, with traditional ERP systems the investment cost for a service of 100 users is \$ 563,097,882. In the latter case, the company is in charge of assuming the costs of the implementation (software and hardware), staff training, updating and maintenance of the system.

Tamami in 2015 [54], carried out a comparative analysis of the tools that an Open ERP system has and thus was able to determine which one can be adjusted to the administration of the processes of an SME that is dedicated to the production of dairy products. The Open ERPs that were analyzed were: ERP ODOO, Openbravo and Compiere. For this process, indicators such as information management, monitoring and editing were used. Given the particularities of the company and the results of the indicators evaluated, the author concludes that ERP ODOO complies with 100% of the established criteria. Secondly, the findings of [52] coincide with [54], by stating that free ERP systems represent an advantage over traditional ones to the extent that the cost of staff training would only have to be assumed, which is represented by a value of \$ 762,000 for four people, unlike the traditional system that has a cost of \$ 2,204,800 for the same number of people.

In 2015, Cartagena and collaborators [55], carried out the comparative analysis of three types of free ERP systems; among these were ERP ODOO (managed in the cloud), Openbravo and Compiere. For this comparison, they took into account characteristics such as: functionality, scalability, modularity, user interface, licenses, among others. With the results obtained, the authors come to the conclusion that with the basic package of the ERP ODOO system, the processes of a medium-sized SME can be managed. In addition, for this system there are a great variety of modules and applications available that are not obtained with the other ERPs mentioned. It is also convenient to mention that you would be saving the cost of the license, which usually represents the highest cost in this type of project; usually in a traditional ERP system it is around \$ 18,894 [53].

In 2015, Santos [56], decided to establish what type of ERP system would suit an SME that is dedicated to wine storage. For this, he studied the characteristics of functionality, operability, scalability, modularity of different free ERP systems such as: Open ERP (ERP ODOO), Openbravo, Adempiere, Compiere, Openxpertya, Neogia and ERP5. Finally, the author concludes that the system that best adapts to the needs of the winery is the ERP ODOO as it meets the following characteristics: zero cost in licenses, wide variety of documentation on the network, easy customization of the application and integration of modules, flexible implementation, possibility of future

developments, good system stability thanks to its clean code and frequent free updates, which allows the continuity of the project.

Acosta and his collaborators in 2017 [21], announced that companies will implement other modules as they grow and as required. The value of a module will be related to the company that designs it (license), to the type of ERP system (free or proprietary) and we must not forget that there are costs related to the implementation of the module (hardware and skilled labor), which will vary in each country, alluding to Latin Americans.

ERP system selection

In 2016, Pérez [57] affirmed that, in order to determine the type of ERP for an SME, it is first necessary to identify the needs that the company seeks to supply. To achieve this first diagnosis, the author used a tool called a cascade model that begins with: initial analysis of the company, process map, development, implementation of the ERP system taking into account the costs that this implies and, finally, maintenance.

On the other hand, in 2016, Riascos and Arias [58], made an important note and that is that, before implementing an ERP system, the company (SME) must standardize the processes, so it is pertinent that a diagnosis, modeling and redesign be carried out if current processes present some type variability.

Rivera and his collaborators in 2018 [59], address a study proposal for the adoption of an ERP system by organizations taking into account the coevolutionary perspective. A social system coexists in all organizations where daily interactions exist between employees, either to exchange information directly or indirectly or to solve problems [60]. The need to maintain this bilateral interaction is highlighted even more in human nature and can influence positively or negatively when applying new theories and technologies [61]. It should be mentioned that part of the resistance that is generated in the adoption of changes within an organization is due to peoples' reluctance to change, which can become a collective trend, so it is important that there is a close relationship between the administrative part to the operational part, so that the change that is taking place is progressively guided [62] [74].

In 2018, Badenes and his collaborators [63], corroborate what was said by Pérez, Riascos and Arias. They analyzed other criteria that a SME must consider when incorporating IT Information Technologies such as ERP systems. Based on the analysis of different methodologies that exist for the selection of ERP systems, they propose MSERP, which is a methodology for the selection of ERP systems, which takes into account the group that will work on the diagnosis of the company, the objectives to

be developed, the selection of the type of system and its provider; taking into account reference companies, as well as the adaptation of the ERP to the particularities of the company. Finally, this methodology includes 16 specific and delimited phases that the SME can follow in a simple way.

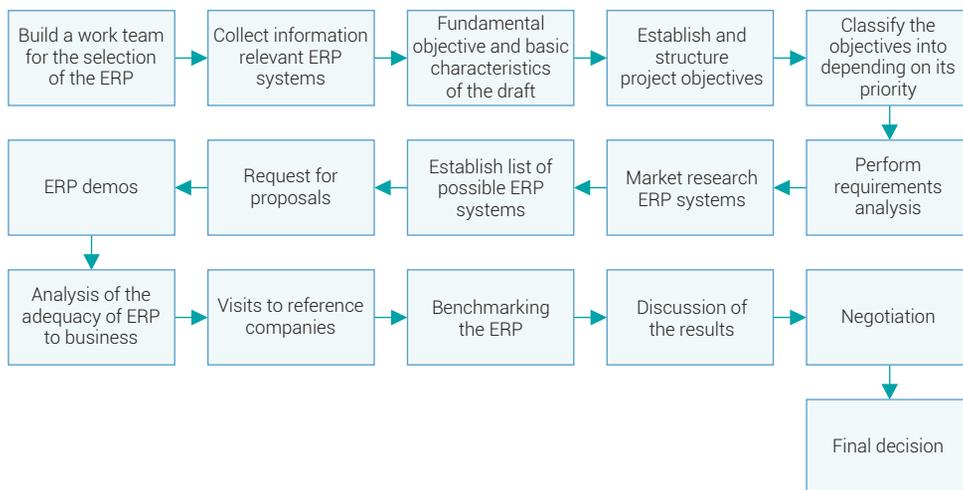


Figure 1. Step to implement the MSERP methodology.

Source: [59].

Hidden costs of ERP systems

Delgado in 2015 [64], mentions that it is important to take into account costs other than those that are already known and that have to do with software and hardware that are the most common. The ones mentioned in [64] and [75] have to do with a company that is dedicated to the construction of civil works in Peru. These related costs are what are known as hidden costs and are often not quantified when launching these types of projects. Keeping these other items in mind will help identify the total investment required to implement the ERP system (see Table 2). Finally, it should be noted that these values, both in money and in days, will vary depending on the Latin American country where you want to execute the project.

Table 2. Hidden costs (Colombian \$) that are generally not taken into account when paying for an ERP system.

Exercise	Action	Duration Approx. (Days)	Cost (Day)	Total
Analysis of the current situation of the company.	Three people performing the diagnosis.	6	\$ 22,000	\$ 396,000
Identification of company needs.	Three people performing the diagnosis.	3	\$ 24,000	\$ 216,000
Survey of processes and identification of critical processes	Three people performing the diagnosis.	3	\$ 24,000	\$ 216,000
Implementation and improvement of company processes.	Internal company staff dedicated to process improvement.	45	\$ 35,000	\$ 1,575,000
ERP system supplier selection.	Periodic online notice for the call.	5	\$ 57,000	\$ 285,000
Proposed evaluation evaluators.	One person to qualify the proposal.	3	\$ 106,016	\$ 318,048
Selection of qualified suppliers.	It does not generate cost.	7	\$ -	\$ -
Final evaluation of qualified suppliers.	One person for preliminary evaluation.	1	\$ 122,000	\$ 122,000
Adjustment of the ERP system to the needs of the company.	Six people transferring information from the old data collection method to digital.	63	\$ 5,000	\$ 1,890,000
Training of employees in the use of ERP.	Ten people in training.	28	\$ 68,035	\$ 1,904,980
Joint test period of the old system with the new system.	Six people in joint test.	7	\$ 4,000	\$ 1,680,000
Evaluation of the implementation process.	One person to present file.	7	\$ 91,321	\$ 639,247
TOTAL				\$ 9,242,275

Source: [60].

4. ANALYSIS

The information found in the bibliographic review study suggests that there are different options for ERP systems, which can be implemented in SMEs in order to help them better manage their business resources, but there is a marked trend towards the migration of systems from Traditional ERPs (Custom, predefined or standard, proprietary and local) to more flexible ones. According to [22] and [65] the Open ERP system is the one that best suits SMEs due to costs [52] [53], implementation time, flexibility and adaptability [45]. For this particular case, it should not be forgotten that ERP systems are composed of several basic modules that serve as a platform to implement others. This undoubtedly represents a benefit, but in the same way, the cost benefit

must be considered when making that new acquisition [23]. On the other hand, it is extremely important that for any type of traditional or free ERP system that the hidden costs incurred prior to the implementation of the system are considered [63].

On the other hand, several authors affirmed that ERP ODOO is a practical, versatile system that can be implemented without any problem in SMEs that are in the goods and services sectors [54] [55] [56]. It has also been possible to identify that it would be convenient for this ERP system to be managed in the cloud, as it would further reduce the implementation costs as well as the support and maintenance issue [47], giving these small production units technological support to automate their basic processes at reasonable prices [64].

This comprehensiveness undoubtedly represents a great opportunity for technological transformation that changes the thinking of the way in which SMEs have been evaluated, controlled and managed, although it also represents a challenge if it is considered that at the Latin American level there is resistance to the implementation of technological systems, due to cultural issues and perhaps due to the technological lag that exists in several countries in this region [66].

At the Latin American level, there is very little literature that talks about the implementation of ERP systems in large organizations such as small and medium-sized enterprises (SMEs), because many have not been successful cases and because within the business policies there is no guideline to document and publish the results obtained.

5. DISCUSSION AND CONCLUSIONS

This document presents a general classification of the most common types of ERP found on the market, which were classified into two groups; the first group would be the proprietary ERPs (Custom, predefined or standard, proprietary and local), and in the second group would be the free ERPs (Open-source).

According to the information provided by different authors, for SMEs it would be convenient to implement ERP systems with the following characteristics. Ideally OpenERPs should be considered first; because you would not have to assume the cost of the license, which generally represents one of the largest penalties in the development of this type of project. You would only have to assume the cost of training the personnel, which is 65% less than in the traditional ones. Second, the ERP system should be managed via cloud; because the difference in terms of implementation costs is 95% lower than the traditional ones. This big difference is due to the fact that in cloud managed ERP systems there are significant savings in software and hardware.

Under another scenario, if the service is outsourced, that is, a company provides the service, the SMEs, it would only have to pay a monthly payment for the use of the ERP system, which means that it would only pay for the service it is using.

On the other hand, the system that best adjusts to the particularities of SMEs is ERP ODOO, as it is a system that has multiple characteristics such as: adaptability to any type of business, scalability regardless of the activities carried out by the company and regardless of the type of business, interaction with other types of system and, finally, the modularity that allows customers to add progressive modules over time as the company grows.

Finally, ERP systems are a modular computing solution made up of independent units called modules, so the costs and time for the implementation of this type of ERP system will vary depending on the number of modules to be added; starting with the basic ones that can then be tailored to incorporate new functions to the ERP system. In the same way, the personnel who carry out the development of the code must be taken into account. It may be the same company that develops this procedure or hiring external personnel. Neither should we forget the hidden costs that have been invested prior to the implementation of the system. Many authors ignore this part, but it is important as it can tip the balance between investing or not.

The limitations in this research came from the fact that the information available on the implementation of ERP systems in SMEs is scarce. This is due in large part to the fact that the organizations that implement this type of information systems do not have within their business policy to disclose the data obtained to the media for security reasons and because many times the cases are not successful. On the other hand, there is also little recent information that allows for a true understanding of real data on the implementation of cloud managed open ERPs in SMEs.

Some recommendations are proposed to guide future research:

During the development of the article, it has been mentioned that ERP systems are undoubtedly a tool that offers multiple benefits when administering and managing any type of organization and there is no doubt that this point has been reached thanks to constant technological evolution and continuous improvement processes in the implementation of these systems in companies. After analyzing the different points of view of several authors who defend that, for SMEs it is convenient to implement an Open-source ERP system that is also managed in the cloud. It would be convenient to carry out the study of the implementation of one of these ERP systems in such a way that they integrate several SMEs from the same sector of the economy.

6. REFERENCES

- [1] GV Nigrini and M. Casalet, "Institutions, the knowledge society and the world of work". Flacso Mexico, pp. 1-30, 2008. [Online]. Available: <https://www.jstor.org/stable/j.ctt16f8csq>.
- [2] Wildebeest. Eclac, "Latin America and the Caribbean and China: towards a new era of economic cooperation", pp. 1-83, 2015. [Online]. Available: "<https://repositorio.cepal.org/handle/11362/38196>
- [3] L. Bálezaga, RC Mompie and B. Valdés, "SCADA systems for the automation of the productive processes of the CIGB," *Ing. Electrónica Automática Comun.*, vol. 37, no. 1, pp. 20–37, 2016. [Online]. Available: <http://scielo.sld.cu/pdf/eac/v37n1/eac03116.pdf>.
- [4] Wildebeest. Eclac, "Agenda 2030 and the Sustainable Development Goals: an opportunity for Latin America and the Caribbean", pp. 1-93, 2019. [Online]. Available: <https://repositorio.cepal.org/handle/11362/40155>.
- [5] M. Dini and G. Stumpo, "MSMEs in Latin America: a fragile performance and new challenges for development policies". ECLAC, pp. 1-73, 2018. [Online]. Available: <https://repositorio.cepal.org/handle/11362/44603>.
- [6] EA Bedoya-Marrugo, et al., "Principal component analysis for structural characterization of manufacturing SMEs in Cartagena de Indias, Colombia," *Lámpasakos*, vol. 1, no. 17, pp. 52–58, 2017. doi: "<https://doi.org/10.21501/21454086.2361>."
- [7] V. Nieto, et al., «The classification by business size in Colombia: History and limitations for a proposal," *Arch. Econ.*, vol. 434, pp. 1–48, 2015. [Online]. Available: <https://EconPapers.repec.org/RePEc:col:000118:013649>.
- [8] R.E. Amores and V.A. Castillo, "Ecuadorian SMEs: their impact on employment as a contribution of SME GDP to total GDP," *Espacios*, vol. 38, no. 53, pp. 1-11, 2017. [Online]. Available: <https://www.revistaespacios.com/a17v38n53/a17v38n53p15.pdf>.
- [9] R.I. Ramírez and D.M. Ampudia, "Business competitiveness factors in the commercial sector", pp. 1-17, 2018. [Online]. Available: <http://hdl.handle.net/11323/2249>.
- [10] J. Villacis, "Competition Factors among SMEs," *Spirals Rev. Multidiscip. Investig.*, vol. 2, no. 16, pp. 1-23, 2018. [Online]. Available: file:///C:/Users/User/Downloads/247-747-1-PB%20(1).pdf

- [11] V. Carnovale, "The combatants: history of the PRT-ERP". *Twenty-first century*, pp. 45-70, 2018. [Online]. Available: <http://hdl.handle.net/11336/114142>.
- [12] C. Cleri, "Book of SMEs, El". Ediciones Granica, pp. 1-298, 2013. [Online]. Available: "<https://books.google.com.co/books?id=JZVfAAAAQBAJ&lpg=PA3&ots=rFgfqiSV3b&dq=Libro%20de%20las%20SMEs%2C%20El&hl=es&pg=PA297#v=onepage&q=Libro%20de%20las%20las%20El&f=false>".
- [13] A. C. Lemus Pinto, C. A. Garzón Sogamoso, y G. M. Tarazona Bermúdez, "TIC en gestión de la cadena de suministro bogotana", *Visión electrónica*, vol. 10, no. 2, pp. 195-202, dic. 2016. <https://doi.org/10.14483/22484728.11653>
- [14] CV Córdova, «Comparative Study of a Traditional approach versus a Cloud approach of an Erp solution for the Service Industry, Case Study Pwc Asesores Empresariales Cía Ltda», pp. 30-40, 2015. [Online]. Available: <http://dspace.udla.edu.ec/handle/33000/3990>.
- [15] FJ García, "Systematic literature review for articles", pp. 1-3, 2017. doi: "<https://doi.org/10.13140/RG.2.2.15223.42403>".
- [16] M. Haddara and H. Moen, "User resistance in ERP implementations: A literature review," *Procedia Comput. Sci.*, vol. 121, pp. 859-865, 2017. doi: <https://doi.org/10.1016/j.procs.2017.11.111>.
- [17] R. Rajnoha, J. Kádárová, A. Sujová, and G. Kádár, "Business Information Systems: Research Study and Methodological Proposals for ERP Implementation Process Improvement," *Procedia - Soc. Behav. Sci.*, vol. 109, pp. 165-170, 2014. doi: <https://doi.org/10.1016/j.sbspro.2013.12.438>.
- [18] P.V. Carrión, et al., "Methodology for the systematic review of literature applied to engineering and education," pp. 1364-1373, 2018. doi: <https://doi.org/10.1109/EDUCON.2018.8363388>.
- [19] C. Okoli, "A guide to conducting a standalone systematic literature review," *Commun. Assoc. Inf. Syst.*, vol. 37, no. 1, pp. 1-33, 2015. doi: <https://doi.org/10.17705/1CAIS.03743>.
- [20] R.N. Burgos, "ERP software: analysis and consulting of business software". *IT Campus Academy*, pp. 1-19, 2016. [Online]. Available: <https://books.google.com.co/books?id=yfXdC-gAAQBAJ&lpg=PA9&ots=8YL0YjWlQn&hl=es&pg=PA9#v=onepage&q&f=false>.
- [21] R.K. Acosta, O.J. Ospino and VE Valencia, "Design of an enterprise resource planning (ERP) system for a micro-enterprise", pp. 1-17, 2017. doi: <https://doi.org/10.17981/ingecuc.13.1.2017.08>.

- [22] A.L. Quispe, et al., "Information and communication technologies in the business management of commercial SMEs," *Ing. Ind.*, vol. 38, no. 1, pp. 81–92, 2017. [Online]. Available: <http://scielo.sld.cu/pdf/rrii/v38n1/rrii080117.pdf>.
- [23] S. AboAbdo, A. Aldhoiena, and H. Al-Amrib, "Implementing Enterprise Resource Planning ERP System in a Large Construction Company in KSA," *Procedia Comput. Sci.*, vol. 164, pp. 463-470, 2019. doi: <https://doi.org/10.1016/j.procs.2019.12.207>.
- [24] P. González, "Implementation of an ERP SYSTEM in a SME", pp. 15-46, 2015. [Online]. Available: <http://hdl.handle.net/10609/42924>.
- [25] S. Nagpal, S.K. Khatri, and A. Kumar, "Comparative study of ERP implementation strategies," Long Island Systems, Applications and Technology, pp. 1-9, 2015. doi: "https://doi.org/10.1109/LISAT.2015.7160177.
- [26] K. Hoppe, K. Küper, and E. Wascher, «Sequential modulations in a combined horizontal and vertical Simon task: is there ERP evidence for feature integration effects?," *Front. Psychol.*, vol. 8, pp. 1-16, 2017. doi: "https://doi.org/10.3389/fpsyg.2017.01094.
- [27] I. Madanhire and C. Mbohwa, "Enterprise Resource Planning (ERP) in Improving Operational Efficiency: Case Study," *Procedia CIRP*, vol. 40, pp. 225-229, 2016. doi: <https://doi.org/10.1016/j.procir.2016.01.108>.
- [28] E.W.T. Darmaningrat, F.A. Muqtadiroh and T.A. Bukit, "Communication Management Plan of ERP Implementation Program: A Case Study of PTPN XI," *Procedia Comput. Sci.*, vol. 161, pp. 359-366, 2019. doi: <https://doi.org/10.1016/j.procs.2019.11.134>.
- [29] L. Mellado, "Analysis and selection of an ERP for a renewable energy SME", pp. 11-24, 2017. [Online]. Available: <http://hdl.handle.net/11441/65482>.
- [30] M. Sánchez, "Guide for the description and implementation of FacturaScripts in the company", pp. 15-24, 2017. [Online]. Available: <http://hdl.handle.net/11441/65910>.
- [31] R. Oltra, "FSw ERP (Free Software ERP). Differences with the proprietary ERP," pp. 1-8, 2017. [Online]. Available: <https://riunet.upv.es/handle/10251/83321>.
- [32] M. Romero García, "Study and comparative analysis of different ERP software from a logistics perspective," pp. 9-23, 2018. [Online]. Available: <http://uvadoc.uva.es/handle/10324/30955>.
- [33] D.L. Olson, B. Johansson, and R.A. De Carvalho, "Open source ERP business model framework," *Robot. Comput.-Integr. Manuf.*, vol. 50, pp. 30-36, 2018. doi:<https://doi.org/10.1016/j.rcim.2015.09.007>.

- [34] T. Herzog, "A comparison of open source ERP systems," *Citeseer*, pp. 33-71, 2006. [Online]. Available: <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.127.6017&rep=rep1&type=pdf>.
- [35] A. Peñas, "Implementation of ERP Odoo in a SME dedicated to Retail Trade", pp. 13-54, 2016. [Online]. Available: <http://uvadoc.uva.es/handle/10324/16892>.
- [36] S. Tasnawijitwong and T. Samanchuen, "Open source ERP selection for small and medium enterprises by using analytic hierarchy process", 2018 5th International Conference on Business and Industrial Research (ICBIR), pp. 382-386, 2018. doi:<https://doi.org/10.1109/ICBIR.2018.8391226>.
- [37] JA Mogrovejo, "Implementation of the ERP Open Source ODOO in a SME", Master's Thesis, Espol, pp. 97-118, 2017. [Online]. Available: <http://www.dspace.espol.edu.ec/xmlui/handle/123456789/38698>.
- [38] A. Ganesh, K.N. Shanil, C. Sunitha, and A.M. Midhundas, "OpenERP / Odoo - An Open Source Concept to ERP Solution", 2016 IEEE 6th International Conference on Advanced Computing (IACC), pp. 112-116, 2016. doi: <https://doi.org/10.1109/IACC.2016.30>.
- [39] O.R. N. Cuadrado and A.J. Reinoso, "Content management system and online store synchronized with ERP," *Tecnología y Desarrollo.*, vol. 14, pp. 3-30, 2016. [Online]. Available: file:///C:/Users/User/Downloads/1152-1013-1-SM%20(2).pdf.
- [40] M.A. Abd Elmonem, E.S. Nasr, and M.H. Geith, "Benefits and challenges of cloud ERP systems - A systematic literature review," *Future Comput. Inform. J.*, vol. 1, no. 1, pp. 1-9, 2016. doi: <https://doi.org/10.1016/j.fcij.2017.03.003>.
- [41] V. Hasheela, "On-premise ERP Organizational Post-implementation Practices", Proceedings of the 17th International Conference on Enterprise Information Systems, vol. 1, pp. 243-250, 2015. doi: <https://doi.org/10.5220/0005348802430250>.
- [42] M.J. Lee, W.Y. Wong, and M.H. Hoo, "Next era of enterprise resource planning system review on traditional on-premise ERP versus Cloud-based ERP: Factors influence decision on migration to Cloud-based ERP for Malaysian SMEs / SMIs", 2017 IEEE Conference on Systems, Process and Control (ICSPC), pp. 48-53, 2017. doi: <https://doi.org/10.1109/SPC.2017.8313020>.
- [43] M.R. Sayavera, "Analysis and implementation guide of ERP Opensource for SMEs and micro-enterprises", pp. 9-26, 2018. [Online]. Available: "<https://hdl.handle.net/11441/85717>".

- [44] S. Demi and M. Haddara, «Do Cloud ERP Systems Retire? An ERP Lifecycle Perspective,” *Procedia Comput. Sci.*, vol. 138, pp. 587-594, 2018. doi: <https://doi.org/10.1016/j.procs.2018.10.079>.
- [45] F.H. Vera and B.R. Pérez, “Agile development model of a cloud ERP for small and medium-sized companies (SMEs) in Norte de Santander,” *Rev. Colombiana de Tecnología Avanzada de. (Rcta)*, vol. 1, no. 27, pp. 1-5, 2017. doi: <https://doi.org/10.24054/16927257.v27.n27.2016.2530>.
- [46] F.J. Del Vecchio, F.J. Paternina and C. Henríquez, “Cloud computing: a model for the development of companies,” *Prospectiva*, vol. 13, no. 2, pp. 81–87, 2015. doi: <http://dx.doi.org/10.15665/rp.v13i2.490>.
- [47] F. Carrión and P. Cedillo, “Methodology for the selection of enterprise resource planning systems deployed in the cloud for small and medium-sized companies: Approach aligned with the Ecuadorian reality,” *Maskana*, vol. 8, pp. 35–49, 2017. [Online]. Available: <https://publicaciones.ucuenca.edu.ec/ojs/index.php/maskana/article/view/1964/1407>.
- [48] F.M. Elbahri, et al., “Comparing SAP, Oracle, and Microsoft Solutions Based on Cloud ERP Systems: A Review,” pp. 65-70, 2019. doi: <http://dx.doi.org/10.1109/CSPA.2019.8695976>.
- [49] P. Galván, et al., “System for the acquisition and storage of data in the cloud for Industry 4.0”, pp. 1-8, 2018. [Online]. Available: <http://200.79.179.163/reia/descargables/2018/01-8.pdf>.
- [50] L.Y. Qian, A.S. Bahadurin and A.K. Jebna, “Factors affecting the adoption of enterprise resource planning (ERP) on cloud among small and medium enterprises (SMES) in Penang, Malaysia,” *J. Theor. Appl. Inf. Technol.*, vol. 88, no. 3, pp. 1-12, 2016. [Online]. Available: <http://www.jatit.org/volumes/Vol88No3/3Vol88No3.pdf>.
- [51] A.M. Albar and M.R. Hoque, “Determinants of Cloud ERP Adoption in Saudi Arabia: An Empirical Study”, International Conference on Cloud Computing ICCS, pp. 1-4, 2015. doi: <http://dx.doi.org/10.1109/CLOUDCOMP.2015.7149637>.
- [52] P.C. Antón, “Exploratory work to determine if the accounting module of an ERP system in the cloud is more convenient for SMEs than the traditional solution.”, PhD Thesis, Universidad de Guayaquil. Faculty of Industrial Engineering. Industrial Engineering career, pp. 24-41, 2015. [Online]. Available: <http://repositorio.ug.edu.ec/handle/redug/13092>.
- [53] V.C. Cando, “Cost benefit analysis of the implementation of an ERP locally versus an ERP in the cloud - SAP r3 vs. SAP Bydesing case study in the city of Quito”, PUCE, pp. 17-49. 2015. [Online]. Available: <http://repositorio.puce.edu.ec/handle/22000/11137>.

- [54] L. Tamami, "Comparative analysis of Enterprise Resource Planning Open Source tools for the administration of the processes of the Salinerito microenterprise", Riobamba: National University of Chimborazo, pp. 27-38, 2015. [Online]. Available: <http://dspace.unach.edu.ec/handle/51000/710>.
- [55] O.J. Cartagena, G.P. Camacho and O.A. Flórez, "Literary analysis for knowledge of ERP for SMEs", pp. 27-40, 2015. [Online]. Available: <http://hdl.handle.net/20.500.12494/17340>.
- [56] L. Sancha, "Selection of a free ERP from a use case: WAREHOUSE", pp. 47-50, 2015. [Online]. Available: <https://uvadoc.uva.es/bitstream/handle/10324/16972/TFG-I-372.pdf?sequence=1&isAllowed=y>.
- [57] J. Pérez, "Study and implementation of an ERP system in a Computer Store SL", pp. 1-10, 2016. [Online]. Available: https://ddd.uab.cat/pub/tfg/2016/tfg_39300/TFG-Jose_Perez.pdf.
- [58] S.C. Riascos and V.H. Arias, "Analysis of the organizational impact in the process of implementation of Information Systems ERP Case Study," *Entramado*, vol. 12, no. 1, pp. 284-302, 2016. [Online]. Available: <https://biblat.unam.mx/hevila/Entramado/2016/vol12/no1/18.pdf>.
- [59] L.Y. Gualdrón, J.M. Acosta and L.E. Bohórquez, "Implementation of enterprise resource planning (ERP) systems in organizations since coevolution", vol. 14, pp. 1-15, 2018. doi: <https://doi.org/10.16925/in.v23i13.1983>.
- [60] J.D. Gómez, D.A. Sierra, et al., "Implications of the organizational structure: organizations as an information processing system", pp. 1-17, 2018. doi: <https://doi.org/10.16925/in.v14i26.2455>.
- [61] L.E. Bohorquez, N.E. Castillo and M.S. Farfán, "Design of the organizational structure and coordination of an observatory based on collective intelligence," *Ing. Solidar.*, pp. 1-25, 2020. doi: <https://doi.org/10.16925/2357-6014.2020.01.10>.
- [62] L.Y.G. Prieto, J.M.A. Romero, and L.E.B. Arévalo, "Organizational structures and adaptation to changing environmental conditions: challenges and implications," *Ing. Solidar.*, vol. 13, no. 23, pp. 1-16, 2017. doi: <https://doi.org/10.16925/in.v23i13.1983>.
- [63] R. Oltra, H. Gil and V. Guerola, "Methodology for the selection of ERP systems for SMEs", *3c Empresa investig. I thought. Critic*, vol. 7, pp. 10-33 2018. doi: <http://dx.doi.org/10.17993/3comp.2018.070436.10-33/>.
- [64] E. Delgado, "Proposal for the implementation of an ERP system that optimizes the administration of the resources of the company MM Ingeniería y Construcción civil SAC", pp.

- 178-180, 2015. [Online]. Available: http://repositorio.ucsp.edu.pe/bitstream/UCSP/14931/1/DELGADO_CACERES_EST_PRO.pdf.
- [65] A.L. Quispe and M.P. Padilla, "The business resources of small and medium-sized commercial companies (SMEs) in the city of Ambato," *Cienc. Digit.*, vol. 1, no. 2, pp. 80–92, 2017. doi: <https://doi.org/10.33262/cienciadigital.v1i2.59>.
- [66] N.N. Kholodkov, "Latin America: The Problem of financing innovation," *Iberoamerica*, no. 2, pp. 7–29, 2017. [Online]. Available: <https://iberoamericajournal.ru/sites/default/files/2017/2/kholodkov.pdf>
- [67] L. Niebles Núñez, S.J. De La Ossa Guerra, y K.D. González Martínez, "Gestión humana en SMEs: herramientas para organizaciones altamente efectivas," *Aglala*, vol. 10, no. 2, pp. 111-121. [Online]. Available: <http://revistas.curnvirtual.edu.co/index.php/aglala/article/view/1437>
- [68] D.A Arrieta Rodríguez, H. Lora Guzmán, y J. Sánchez González, "Análisis de las empresas de Cartagena del sector logístico portuario basado en el modelo de configuración estratégica de Danny Miller," *Aglala*, vol. 9, no. 1, pp. 62-90. [Online]. Disponible: <http://revistas.curnvirtual.edu.co/index.php/aglala/article/view/1182>
- [69] A. Castro Alfaro, A. Caballero Tovío y J. Palacios Rozo, "La competitividad potencial del puerto de Cartagena: una oportunidad para el comercio exterior," *Aglala*, vol. 9, no. 1, pp. 22-40. [Online]. Disponible: <http://revistas.curnvirtual.edu.co/index.php/aglala/article/view/1180>
- [70] H. Bernal Conde, J.R. Rodríguez Soto y I.C. Ortegón Guzmán, "La composición empresarial y la incidencia en el fortalecimiento misional en las Unidades de Salud de Ibagué USI," *Aglala*, vol. 11, no. 2, pp. 167–176. [Online]. Disponible: <https://revistas.curn.edu.co/index.php/aglala/article/view/1707>
- [71] L. Mercado León, "Impacto de la revaluación del peso frente al dólar en las exportaciones de atún por el puerto de Cartagena de Indias en el periodo 2008-2012," *Conocimiento Global*, vol. 3, no. 1, pp. 30-49. [Online]. Disponible: <http://conocimientoglobal.org/revista/index.php/cglobal/article/view/6>
- [72] O. Vásquez Duarte, D. García Muñoz y J. Páez Páez, "Conquistando Soacha - Herramientas pedagógicas para intervención de dificultades relacionadas con los dispositivos básicos de aprendizaje," *Conocimiento Global*, vol. 4, no. 1, pp. 12-25. [Online]. Disponible: <https://conocimientoglobal.org/revista/index.php/cglobal/article/view/31>

- [73] J. Palacios Rozo, J. Ortiz Quevedo, J. Nuñez Uribe, y I. Porras Rojas, "Competencias sociales en docentes universitarios en la ciudad de Bogotá," *Conocimiento Global*, vol. 4, no. 2, pp. 57-68. [Online]. Disponible: <http://conocimientoglobal.org/revista/index.php/cglobal/article/view/35>
- [74] L. Restrepo Sierra, "Potencialidades de la comercialización de flores exóticas tropicales en el municipio de Aguachica-Cesar," *Conocimiento Global*, vol. 4, no. 1, pp. 1-11. [Online]. Disponible: <http://conocimientoglobal.org/revista/index.php/cglobal/article/view/30>
- [75] J.P. Ortiz Quevedo y R. Nuñez Uribe, "Percepciones docentes de las didácticas en el entorno virtual," *Conocimiento Global*, vol. 4, no. 1, 67-78. [Online]. Disponible: <https://conocimientoglobal.org/revista/index.php/cglobal/article/view/35>
- [76] D.M. Duarte Rey, M. A. Barrientos Rosales, y D. Castro Alfaro, "La subutilización del neuromarketing en Colombia como herramienta de posicionamiento de marca," *Enfoque Disciplinario*, vol. 4, no. 1, pp. 28-36. [Online]. Disponible: <http://enfoquedisciplinario.org/revista/index.php/enfoque/article/view/17>
- [77] F. Agredo Satizábal, "Impacto de las TIC en la competitividad empresarial soportada por un modelo de educación digital," *Enfoque Disciplinario*, vol. 4, no. 1, pp. 37-50. 2019. [Online]. Disponible: <http://enfoquedisciplinario.org/revista/index.php/enfoque/article/view/20>
- [78] Martínez Amado, W. E., Barbosa Guerrero, L. M., Amaya Cocunubo, I. F., & Guzmán Ramos, H. F. (2020). ¿Son los momentos de crisis, una oportunidad para las marcas?. *Enfoque Disciplinario*, 5(2), 19-23. Recuperado a partir de <http://enfoquedisciplinario.org/revista/index.php/enfoque/article/view/22>
- [79] G. Ramírez Elias y A. Pérez Paredes, "Las finanzas personales bajo el impacto de la Covid-19 en México," *Enfodis*, vol. 6, no. 1, pp. 32-41.