

# An Overview of Information Systems and Process Automation in Peruvian Microenterprises

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**Abstract** – The purpose of this research is to review the literature on the importance of Information Systems (IS) and process automation in Peruvian microenterprises, and how they can improve their efficiency and complexity in the market. The activities addressed were related to identifying, analyzing, evaluating, and proposing alternative solutions for the implementation of information systems and process automation in Peruvian microenterprises. The methodology used was PRISMA. Inclusion criteria were established considering relevance, contribution, time of publication, and studies related to the topic. The study demonstrates the existence of a lack of information systems implementation process in Peruvian microenterprises. The reasons are centered on limited economic resources, a poor purchasing power, the lack of knowledge about the benefits of technologies and the unstable perception of the contribution of information systems.

**Keywords** – Information Systems, Peruvian microenterprises, process, automation.

## 1. Introduction

Currently, microenterprises in Peru face great challenges to remain competitive in the commercial market.

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The main challenge for microenterprises is the lack of knowledge about technological trends for their business processes automation. This situation has caused numerous microenterprises to persist in managing their daily tasks manually on paper. As a result, this scenario can generate financial losses and sometimes the execution of unnecessary processes that become extensive and cumbersome for the end user.

The absence of automation and information systems in Peruvian microenterprises is a problem that denotes low productivity, increased costs, and loss of growth opportunities in the market [23]. These companies often struggle to keep up with technological advances and meet customer demands in an increasingly competitive market. Additionally, the lack of a solid technological infrastructure can also cause security and vulnerabilities problems in the information.

On the other hand, such systems can help reducing costs, improving the quality of customer services, increasing the speed and accuracy in processes and providing greater transparency in the data security. Likewise, the application of technology and information systems can also help microenterprises to successfully compete with larger and more established companies in the market [14]. Another aspect that must be recognized is that technological progress has radically transformed the way in which companies operate and compete in the marketplace. It is also important to establish that process automation has become a key strategy for improving efficiency, reducing costs, and increasing productivity in organizations of all sizes [28].

Microenterprises play a key role in the Peruvian economy. They represent a significant part of the country's business fabric and contribute substantially to employment generation and economic growth. However, many of these microenterprises face obstacles that hinder their development and growth, such as limited resources, lack of technological know-how and inefficient manual processes.

This is where information systems and process automation come into play [11].

An information system is an organized structure of people, data, processes, and technology that interact to collect, process, store, and distribute information necessary for the operation of an enterprise [10]. The implementation of an effective information system enables microenterprises to collect relevant data, analyze it and use it to take more informed and timely decisions [27]. In addition, a well-designed information system can help automate routine and repetitive tasks, freeing up time and resources that can be allocated to higher value-added activities.

Process automation involves using technology to execute tasks or activities automatically, without human intervention. In this context, it means replacing manual processes with automated systems that perform tasks with greater efficiency and accuracy. For example, instead of manually tracking financial transactions, an automated system can automatically record and process information, generating updated financial reports in real time.

The implementation of information systems and process automation can bring several benefits to Peruvian microenterprises. First, by reducing reliance on manual processes, errors are minimized and data accuracy is improved. This would help ensure the integrity of information and facilitate better decision making. In addition, automating repetitive and low-complexity tasks allows employees to focus on activities that require more specialized and creative skills. Another important benefit of information systems and process automation is the improvement of operational efficiency. In addition to internal benefits, information systems and process automation could also have a positive impact on customer relationships.

Having more efficient and accurate systems, microenterprises could improve the quality of service they provide to their customers, increasing customer satisfaction and loyalty. The implementation of information systems can enable microenterprises to collect and analyze data about their customers, which in turn allows them to better understand their needs and preferences.

Information systems and process automation represent a key opportunity to improve the efficiency and competitiveness of Peruvian microenterprises. These technological tools can help overcome the challenges inherent in limited resources and inefficient manual processes. By implementing effective information systems and automating tasks, microenterprises can optimize their operations, make more informed decisions and improve the customer experience.

Ultimately, this can contribute the sustainable growth and development of Peruvian microenterprises in an increasingly competitive and technological business environment.

The purpose of this study is to focus on the importance of information systems and process automation in Peruvian microenterprises, as well as how they can improve their efficiency and complexity in the market. The activities to be addressed in the study are related to identifying, analyzing, evaluating, and proposing solutions for the implementation of the system and process automation in Peruvian microenterprises. For the methodological development, we will use bibliographic databases, in which terms such as process automation and information systems are used as reference terms.

## 2. Methodology

The PRISMA method was used, as it is a systematic and rigorous tool for conducting systematic reviews and meta-analysis of multidisciplinary studies [21]. Figure 1 describes the phases that guide the research.

The initial focus is on identifying accessible bibliographic databases that lead to the search for current and quality scientific articles. This cycle also considers aspects of selection, eligibility, and the inclusion of papers related to the topic of study.

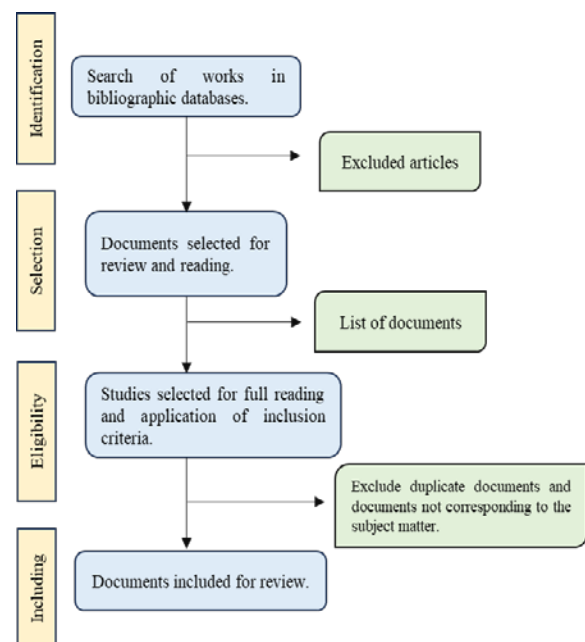


Figure 1. Procedure for the review

### 2.1. Bibliographic Database

The main databases used for information gathering are SCOPUS, CONCYTEC and university archives for in-depth treatment.

Several authors have highlighted the importance of information systems versus automation in microenterprises [3]. It turns out that with the help of IT tools it is possible to integrate customized software to support and improve the business processes and decision making of the organization.

**2.2. Inclusion Criteria**

Scientific articles dealing with the analysis of criteria related to the use of process automation and related information systems in the bibliographic database published in the last decade were used, both international and national, as well as research carried out in Spanish and English.

**2.3. Exclusion Criteria**

Research from unknown or unreliable sources where there was little relevant information on the subject was discarded.

**2.4. Classification of Information**

The classification of information is selected according to the categories of process automation, information system and implementation of information systems. It is also classified according to the year of circulation and the value of each item.

**2.5. Analysis of Results**

An analysis of the articles was carried out, based on the main contributions and their results provided by the previous authors, in order to identify the similarities in the research to set up the respective conclusions of the study of this scientific literature review article.

**3. Results**

Having addressed the previous section, the results reflected 31 scientific articles related to the study, of which 20 were chosen for their relevance and 11 were rejected for not meeting the inclusion and exclusion criteria.

As observed in Table 1, the percentage of articles published in Google Scholar was 55%, followed by CONCYTEC with 25% and SCOPUS with 20%.

In these articles, different reasons for disqualification were analyzed, one of which was related to a period of more than 8 years and many reasons that were not directly related to this research.

Table 1. Analyzed articles

Bibliographic databases	Quantity	Percent
SCOPUS	2	10%
CONCYTEC	18	90%
Total	20	100%

On the other hand, Table 2 represents the percentage of selected articles per year describing the evolution of scientific publications related to the topic of study. Between 2021 and 2022, a greater number of contributions have been identified compared to the other years.

Table 2. Summary of findings by year of publication

Year	Quantity	Percent
2016	1	5%
2018	2	10%
2019	1	5%
2020	2	10%
2021	5	25%
2022	9	45%

**3.1. Classification of Articles**

The classification of the information was selected by category, which were: process automation, information system, information system implementation. Tables 3, 4, 5 and 6 describe the most relevant findings on the performance and the need for information systems in Peruvian microenterprises.

**3.2. Importance of Information Systems**

In this section, Table 3 describes some findings that emphasize the importance of information systems.

Table 3. Importance of information systems and automation of processes in microenterprises

Title	Author	Year	Source	Contribution
Automation of processes	Echeverri Arias	2020	Repository CONCYTEC	Defines process automation as a way of identifying and eliminating repetitive, manual, and rule-based activities, replacing them with computer and technological systems that can perform these tasks more efficiently and accurately [6].
	Ramirez Aldana	2021		It is an essential step for working in line with modern management trends [20].
	Martínez Rosales, Samantha	2022		The use of technology and tools to perform tasks and activities in an automated manner, without the need for direct human intervention [18].
	Campoverde, Roxana Granda	2022		Process automation controls business processes for consistency and transparency. It is usually managed by special software and business applications [3].
	Suárez-Concepción, Fernando	2022		The process automation can enable the creation and management of electronic data and documents, some with human intervention and others automatically, generated by BPMS or by integrating it with other systems [24].

Table 3 also set ups that process automation has emerged as an innovative solution to optimize efficiency and accuracy in business tasks by eliminating repetitive, manual, and rule-based activities and replacing them with computer and technological systems. This not only implies an increase in productivity, but also allows organizations to adapt to modern trends in administrative management.

The implementation of process automation has become essential to keep up with today's business environment. Companies are looking for ways to streamline their operations and reducing costs, and automation has become a key step on that path. By using technology and tools to execute tasks in an automated manner without direct human intervention, organizations can improve efficiency, minimize errors, and free up resources that can be allocated to higher value-added activities. In addition, process automation offers other advantages.

Controlling business processes for consistency and transparency is one of the key advantages. By managing them through special software and business applications, consistent and reliable execution of tasks is ensured, which in turn leads to greater efficiency and quality results.

It is important to note that process automation does not imply the complete elimination of human intervention [16].

Often, a certain degree of collaboration and supervision is required from employees.

Automation can enable the creation and management of electronic data and documents, some generated automatically and some with human intervention.

Integration of automation with other systems, such as business management or workflow systems can be crucial for efficient and effective implementation. These approaches reveal that process automation is an essential strategy in today's business management. By eliminating repetitive and manual activities and replacing them with computerized and technological systems, organizations can improve efficiency, accuracy, and consistency in their operations.

Automation is not only in line with modern back-office management trends, but also enables companies to adapt and thrive in an increasingly competitive business environment. However, it is important to remember that human intervention is still required at certain key points in the process, and integration with other systems can maximize the benefits of process automation.

### 3.3. Information Systems Implementation

Table 4 set ups the significant details that microenterprises should consider when implementing an information system.

Table 4. Implementation of information systems and the automation of processes in microenterprises

Title	Author	Year	Source	Contribution
Information systems	Agudelo Arboleda	2022	SCOPUS	It is a collection of elements that interact with specific objectives [1].
	Santamaría, Edgar	2019	Repository CONCYTEC	Information systems generate reports that allow managers to improve management control over various functional areas of the company [22].
	Lira Camargo, Jorge	2022		They are the means by which data travels from one person to another and can range from internal communication between different parts of the organization and from telephone lines to computer systems that generate periodic reports for different users [15].
	Cruz Pérez, Mario	2022		An interdependent collection that collects, processes, stores, and distributes information to support decision making and control procedures within an organization [5].
	Álvarez González, Irantzu	2016		Describes that the information systems are a technologically implemented means for the recording and storing of information [8].

Table 4 shows that the implementation phase of information systems is related to an effective strategy for improving management control in various functional areas of the company and organizations in general. Thanks to the reports generated by these systems, managers have access to accurate and up-to-date information on the organizational performance, enabling them to make more informed and timely decisions. These systems act as a technological means of recording and storing data relevant to the

company. From internal communication between different parts of the organization to the generation of periodic reports for different users, information systems become the channel through which data flows and is shared within the company. This facilitates the coordination of activities, decision making and process control.

It is important to note that information systems are a collection of interdependent elements that interact with each other for specific purposes.

These elements include hardware, software, communication networks, databases and people. Each of these components plays a crucial role in collecting, processing, storing, and distributing the information needed to support decision making and control procedures within the organization.

The integration of information systems in Peruvian microenterprises allows for greater efficiency in management control. By automating repetitive tasks, errors are reduced, and processes are streamlined, which in turn improves the quality of information available to managers. This gives them a clearer and more accurate view of the company's performance, enabling them to identify areas for improvement, allocate resources more efficiently and evaluate the impact of decisions made. In addition, information systems not only improve internal management control, but also facilitate communication and information sharing with other stakeholders, such as suppliers, customers, and business partners. Thanks to integrated information systems, microenterprises can establish fluid and efficient communication,

resulting in better coordination of activities and greater responsiveness to market demands.

The implementation of information systems in Peruvian microenterprises offers a number of significant benefits, especially in terms of management control. These systems allow managers to have access to accurate and up-to-date information, which improves their ability to make informed decisions. They also promote efficiency in internal processes and facilitate communication with other stakeholders. In an increasingly competitive and technological business environment, information systems are becoming an essential tool for the growth and development of Peruvian microenterprises.

### 3.4. Evaluation of IS Implementation

It is not enough to implement and make use of the information systems; it is also necessary to evaluate their performance in each of their stages. That is why Table 5 shows characteristics that allow for evaluating the implementation of information systems.

Table 5. Evaluation of the implementation of information systems and the automation of processes in microenterprises

Title	Author	Year	Source	Contribution
Implementation of systems	Varas, Cristian Pliscoff	2021	Repository CONCYTEC	The purpose of information systems is to manage and operate the data that constitute them. The main thing is that it is always possible to retrieve this data and also to access it easily in a completely secure way [26].
	Jarlín Ortiz, Sol	2021		Implementing the solution means developing an online application system that must be integrated with existing IT systems [13].
	Puentes, Montse Martínez	2022		The process of implementing a new information system requires a review of the organization's activities in order to adopt, manage, and adapt it [19].
	Martínez Ramírez, Violeta	2021		It is a formal set of processes, working with a structured set of data structured according to the needs of a company, collecting, building and (partially) disposing of the information necessary for the operations of the company mentioned above [17].
	Valarezo, Robin	2018		It is an ordered set of mechanisms whose purpose is to manage data and information so that they can be easily and quickly retrieved and processed [25].

Some reflections in Table 5 indicate that information systems are designed to ensure that data are retrievable and accessible in a secure manner. Reliable and easily accessible data is essential, as it provides a solid basis for effective management and decision making of a company, particularly in Peruvian microenterprises. The implementation of an information system involves developing a solution that integrates with existing IT systems. This highlights the importance of integration and interoperability between the different systems and applications used in an organization.

Another necessary aspect to be considered for a successful implementation requires careful planning and consideration of how the new system will interface and collaborate with the systems already in use. It is important to mention that information systems are composed by formal and structured processes that work with data organized according to the needs of the company.

The process of implementing a new information system involves a thorough review of the organization's activities. It also involves adopting, managing and adapting the system to the specific needs and characteristics of the organization.

Also, successful implementation requires a thorough understanding of existing processes and activities, as well as strategic planning to implement the system efficiently and minimize any disruption to day-to-day operations. In general, information systems are a set of orderly mechanisms designed to manage data and information effectively. Their objective is to facilitate quick and easy retrieval and processing of information. This would give Peruvian microenterprises a competitive advantage by

enabling them to make informed decisions and conduct operations efficiently.

### 3.5. Solutions for Implementing Information Systems

Table 6 represents some reflections focused on the solution alternatives that frame the information systems and what positive and negative aspects should be taken into account as part of a possible technological solution.

Table 6. Solutions for the implementation of information systems and the automation of processes in microenterprises

Title	Author	Year	Source	Contribution
Solutions for system implementation	Gorgues, Christian	2018	SCOPUS	To recognize sales interest, expand product assortment, remove slow-selling products from inventory, and increase store sales by stocking high-demand products [9].
	Cárcamo, Andrea D	2022	Repository CONCYTEC	It describes that a technological solution represents a process where, after a thorough analysis of a given research object, a problem is identified to generate an answer and this answer becomes a solution to a technological problem. A technological solution is a response that examines the available resources, trying to be as efficient as possible [4].
	Figueroa, Víctor	2023		One of the keys to successfully develop a Business Intelligence (BI) project is to select the indicators and the most appropriate tool to implement the system [7].
	Burbano-Figueroa, Óscar	2020		It is important to know previously the business process flow to identify the functions and requirements needed by the system and adapt them to the current processes of the company [2].
	Hernández, Danilo	2021		The establishment of information systems is necessary because they support this type of organization, they play a very important role, they must provide the necessary functions to meet all the information needs it requires, accurately and quickly, and thus facilitate its operation in daily tasks and have a better accounting control [12].

Table 6 also shows the importance of technological solutions and their connection with information systems in the business environment. It is obvious that a technological solution represents the result of a thorough analysis and identification of a problem, which is then addressed through an effective response using available resources. It is essential that technology solutions focus on maximizing efficiency and being as effective as possible in solving specific technology problems. In the context of BI, selecting the right indicators and tool to implement a BI system becomes a key factor for the success of the project. The right choice will allow obtaining relevant and valuable information for decision making, which is essential to improve the performance of Peruvian microenterprises.

The implementation of information systems is also related to the optimization of business operations.

For example, in sales, it is crucial to identify customer interest, expand product variety, reduce inventory of slow-moving products, and increase sales of products in high demand. Establishing information systems in organizations lies in their ability to provide the functions necessary to meet information needs accurately and quickly. This, in turn, facilitates daily tasks and improves accounting control. Finally, it is critical to understand the existing business process flow in a company before implementing an information system. Alignment between information systems and business processes is a determining factor for the efficiency and overall performance of the organization.

In conclusion, technology solutions and information systems play a key role in optimizing business operations. These solutions are the result of careful analysis and focus on addressing specific problems efficiently.

The right choice of tools and understanding of business process flows are crucial to successful implementation. By leveraging technology solutions and information systems, Peruvian microenterprises can improve their efficiency, make more informed decisions and optimize their overall performance.

#### 4. Conclusion

Information systems and process automation are of great importance for microenterprises, due to their effectiveness and dynamism in the verification and use of the various operations with cross-cutting and multidisciplinary approaches that contribute to increasing productivity, optimizing resources and facilitating decision making. Therefore, its contribution is aimed at managing volumes of data to provide a better customer experience.

It is necessary to identify the lack of implementation process of information systems in Peruvian microenterprises that contribute to the automation of their processes. This is due to reasons such as lack of assets and lack of knowledge about the advantages of these technologies, limited economic resources, poor decision-making power and an incorrect perception of information systems in terms of process automation. It is important to promote and encourage the need and importance of this type of disruptive tools that contribute in a transversal way during the development of operational processes. It is urgent that technology companies are empathetic, taking into account economic factors and digital availability in the area of its application that does not lead to high costs and generate inappropriate perceptions. For future studies, it is recommended to integrate demographic patterns such as geographic space, technological availability and knowledge about information technologies.

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