


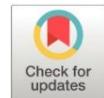


Herramientas digitales para la gestión de información en las PYMES de cinco cantones de Cotopaxi

*Digital tools for information management in SMEs in five cantons of
Cotopaxi*

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Palabras clave:

PYMES, gestión, herramientas digitales, información

Keywords:

SMEs, management, digital tools, information

Resumen

Introducción: el presente estudio se enfocó en el uso de herramientas digitales para la recopilación, organización, almacenamiento, análisis, distribución de datos en las PYMES de Pujilí, Salcedo, Latacunga, La Maná y Saquisilí. **Objetivos:** analizar el uso de herramientas digitales para la gestión de la información en dichas empresas. **Metodología:** la investigación se realizó a través de una revisión bibliográfica y un análisis descriptivo-explicativo, utilizando un enfoque cuantitativo con un diseño no experimental y transversal. La población del estudio estuvo constituida por pequeñas y medianas empresas de los cantones mencionados, para lo cual se diseñó un cuestionario con el fin de recolectar información. **Resultados:** los resultados mostraron que las herramientas digitales más utilizadas para la gestión de la información son las herramientas de análisis de datos y almacenamiento en la nube; las cuales son básicas. Es por eso, que existe un gran déficit de uso de herramientas como gestión de proyectos, gestión de relación con el cliente y plataformas de comunicación; el motivo es por la carencia de recursos económicos, falta de capacitaciones y no cuentan con equipos tecnológicos. **Conclusiones:** en la actualidad, es crucial que las empresas adquieran conocimiento y pongan en práctica el uso de herramientas digitales por varias razones fundamentales; las mismas que permiten operar de manera más eficiente, reduciendo costos y tiempo en los procesos, lo que favorece en una mayor competitividad en el mercado. **Área de estudio general:** Administración y economía. **Área de estudio específica:** TICs en la gestión de la información. **Tipo de estudio:** Artículos originales.

Abstract

Introduction: the present study focused on the use of digital tools for data collection, organization, storage, analysis, distribution in SMEs in Pujilí, Salcedo, Latacunga, La Maná and Saquisilí. **Objectives:** to analyze the use of digital tools for information management in these companies. **Methodology:** the research was conducted through a literature review and a descriptive-explanatory analysis, using a quantitative approach with a non-experimental and cross-sectional design. The study population consisted of small and medium-sized enterprises in

the aforementioned cantons, for which a questionnaire was designed to collect information. Results: the results showed that the most used digital tools for information management are data analysis tools and cloud storage, which are basic. That is why, there is a great deficit in the use of tools such as project management, customer relationship management and communication platforms; the reason is due to lack of economic resources, lack of training and not having technological equipment. Conclusions: at present, it is crucial that companies acquire knowledge and implement the use of digital tools for several fundamental reasons; the same that allows them to operate more efficiently, reducing costs and time in the processes, which favors greater competitiveness in the market. General area of study: Administration and economy. Specific area of study: ICT in information management. Type of study: Original articles.

Introduction

Information management in the digital age has been transformed by a wide range of digital tools that facilitate the collection, organization, storage, analysis and distribution of data and content. As stated by Balseca & Espinoza (2023), information management allows the systematic organization of various contents and data, facilitating their subsequent distribution to users who require this information. For this reason, multiple organizations, institutions and people integrate it into the development of their documentary activities and information management.

In the same context, information management has become a fundamental aspect for organizations of all sizes and sectors. As Aguirre (2023) states, information management has come a long way from the physical archives of the 19th century to today's digital age. With the exponential growth of data and the digitalization of processes, companies must manage large volumes of information efficiently and effectively to remain competitive.

Therefore, "digital tools are managers that allow documents to be created, organized and published collaboratively" (Morán et al., 2021, p. 6). Therefore, information management includes document management software, content management systems (CMS), databases, data analysis tools, online collaboration platforms, among others. These tools allow organizations to manage large volumes of information effectively, ensuring its accessibility, integrity and security.

Table 1 details the different types of digital tools that contribute to information management.

Table 1

Digital tools for information management

Digital tools	Concept
Business management software	“It is an information system that allows integrating and managing many of the aspects associated with the production, logistics, distribution, inventory and accounting of a company” (Di Bartolo et al., 2020, p. 318).
Project management platforms	“These tools provide a centralized platform where project teams can create, assign, and track tasks throughout the development of the project (Sánchez, 2023, p. 1).
Customer relationship management software	“These are the technological solutions to develop the “theory” of relational marketing, which is the business strategy focused on anticipating, knowing and satisfying the present and foreseeable needs and desires of customers” (Martínez-Urrego, 2020, p. 23).
Cloud storage tools	“It is a storage system that allows us to store data on external servers, generally owned by a company that we hire for services” (Castillo & Elías, 2022, p. 6).
Communication and collaboration platforms	"Since the beginning of the so-called web 2.0 or social web, SMEs have had the option of accessing and using multiple interactive platforms to carry out their communication management, allowing us to communicate and collaborate effectively, even in remote environments" (Armírola et al., 2020, p. 154).
Data analysis tools	"Data analysis tools are Business Intelligence software that tend to include and synthesize information in certain ways that facilitate the decisive process on what actions and procedures the company will follow" (Delgado, 2021, p. 2).

Note.Types of digital tools used in information management

Entering the context of SMEs, according to Arguello et al. (2021) tells us that Small and Medium Enterprises (SMEs) are productive units that generate employment and wealth for a nation, and which, in order to survive, are forced to create strategies aimed at overcoming barriers and innovating in the market. Precisely these are associated with the use of Information and Communication Technologies, to strengthen productivity and competitiveness, thereby strengthening the producer-consumer relationship to further facilitate access to goods and/or services.

During the Covid-19 pandemic and its context, they have had a social economic impact worldwide, in Latin America, especially on SMEs, that is, small and medium-sized companies, which suffered consequences in the reduction of demand, difficulties in supplying inputs, among other problems, causing these organizations to lower their levels of production, employment, and serious liquidity problems. To survive the impacts caused by the Covid-19 pandemic, many companies had to resort to the intensive use of digital tools to implement online sales in SMEs and at the same time help with teleworking, as well as manage production processes remotely (Yáñez et al., 2022).

For our research, it was based on some studies carried out on the use of digital tools for information management in SMEs, as indicated by Centeno (2018) from the Central American Technological University UNITEC in Honduras, analyzed the implementation of cloud storage tools for SMEs in the accounting service sector of the city of Tegucigalpa, determined that 33% of SMEs make use of this digital tool, while 71% of companies do not have such a tool because they have no interest in investing. In this research, the implementation of cloud storage tools such as Google Drive, Dropbox and Microsoft OneDrive can significantly improve accessibility to files and documents. In addition, these platforms offer advanced security measures that help keep information safe compared to traditional storage methods in physical locations.

Another research work by Rivera (2018) entitled: “Application of Business Intelligence in a small company through the use of Power BI”, from the University of Valladolid in Spain, showed that this data analysis tool is one of the greatest opportunities for improvement in which any company can have a record of its workers, sales, suppliers and customers, to draw conclusions and make decisions. Tools such as data analysis are essential for SMEs, as they help improve efficiency in data management, optimize internal processes and increase their profitability in the company.

For many years in Ecuador, small and medium-sized businesses have faced significant challenges in information management due to the lack of adoption and effective use of digital tools. As noted by López et al. (2020), “Ecuador was one of the countries hardest hit by the pandemic, which put small and medium-sized businesses at risk” (p. 286). To survive the impacts caused by the Covid-19 pandemic, many companies had to resort to the intensive use of digital tools to implement online sales in SMEs and at the same time help teleworking, as well as manage production processes remotely. (Anchaluiza-Barrionuevo & Álvarez-Gavilanes, 2022).

A research article by Galarza (2024), belonging to the Salesian Polytechnic University in the city of Guayaquil, carried out an analysis of the use of technologies and communication in SMEs in Guayaquil where their research results showed that there is a growing interest in the adoption of innovative tools, mainly in the field of artificial intelligence and virtual reality, other tools such as BigData, BlockChain to achieve better

results and optimize their processes. The lack of this digital tool for information management causes administrative processes to stagnate and generates resistance to change, these tools are powerful to manage and understand large amounts of digital information.

Of course, the lack of training and financial resources to implement and use digital tools is one of the main challenges that SMEs in Ecuador face in this area (Ullauri & Vargas, 2024). The different tools applied to SMEs are segmented according to their use; this process is carried out by recording the activity of each company, building a database and classifying them. In Ecuador, as in most countries in the world, SMEs constitute the basis of the business and productive fabric of the country. According to data from the Ministry of Production, Foreign Trade, Investments and Fisheries (2024), in Ecuador there are 75,000 SMEs, which generate one million jobs, equivalent to 34% of the country's productive force; and USD 38,755 million dollars in annual sales. Furthermore, the Ecuadorian Standardization Service (INEN, 2024) mentions that small and medium-sized enterprises are involved in all productive activities of the economy, such as wholesale and retail trade; agriculture, forestry and fishing; manufacturing industries; construction; transportation, storage and communications; real estate, among others.

Likewise, in our country, technology has been used more in teleworking and digital commerce. Currently, 43% of small and medium-sized companies use digital tools that allow them to adapt to day-to-day circumstances. Likewise, according to data from the National Institute of Statistics and Censuses (INEC) (Primicias, 2024), these digital tools have contributed significantly to their performance, especially in the area of sales, where revenues ranged between USD 2.76 billion and USD 3.22 billion during 2021. This figure represents a growth of 20% to 40% compared to the previous year, 2020.

Consequently, in the province of Cotopaxi there has not been a favorable development in the potential development of production in SMEs, this is due to the fact that companies have decided not to invest in digital tools to manage their information processes, raw materials and automated systems (Yáñez et al., 2022). As in other parts of the world, they face an increasingly competitive and changing business environment, where the ability to adapt and use digital tools can make the difference between success and failure.

This is why it is important to conduct a study on the use of digital tools for information management in SMEs in the 5 cantons. This analysis will allow us to identify how these companies are using these digital tools to manage the data generated on a daily basis. Ineffective use of these technologies reduces the ability of SMEs to make informed decisions, improve their internal processes and compete efficiently in today's market. In an environment where digitalisation and technology are essential for business success, this lack can put companies at a considerable disadvantage compared to more technologically advanced competitors.

The main objective of this research work is to carry out an analysis of the use of these digital tools for information management in small and medium-sized companies in the cantons of Pujilí, Salcedo, Latacunga, La Maná and Saquisilí through an information collection instrument that allows verifying which are the most used and those that could offer greater benefits in accordance with the business lines.

Methodology

This research will take a quantitative approach, based on the use of bibliographic data from articles and academic journals for the collection and analysis of information. According to Acosta (2023), the quantitative approach answers the research questions, is based on the analysis and measurement of numerical data; for the collection of information, it uses questionnaires, surveys, controlled experiments and the analysis of secondary data that will be subjected to statistical processes.

This methodology will allow a comprehensive assessment of the use of digital tools in SMEs in the cantons of Pujilí, Latacunga, Salcedo, La Maná and Saquisilí. In the same way, the research design will be non-experimental, since the variables will not be manipulated. Also, a transversal axis because the field information will be taken at a single moment, not probabilistic.

The population targeted by this research includes all SMEs registered in the cantons of Pujilí, Salcedo, Latacunga, The Mana and Saquisilí of which, according to data from the Ministry of Production, Foreign Trade, Investments and Fisheries (2024), amount to a total of 33 companies. Of this population, all of these registered companies will be taken into account.

The following table 2 details the SMEs from the 5 cantons belonging to the province of Cotopaxi, to which the instrument will be applied.

Table 2

SMEs from the cantons of Pujilí, Salcedo, Latacunga, La Maná and Saquisilí

Cantons	Size	Category	Total SMEs
Pujili	Median	1 Floriculture	1
	Small	1 Trade	
Salcedo	Small	1 Transport and logistics	8
	Small	1 Agroindustrial	
	Median	2 Agroindustrial	
	Median	3 Agriculture	
	Small	5 Trade	

Latacunga	Small	1 Livestock	22
	Small	5 Manufacturing industry	
	Small	1 Tourism and Hospitality	
	Small	1 Transport and Logistics	
	Median	4 Trade	
	Median	4 Industrial	
	Median	1 Agriculture	
The Manna	Median	1 Trade	1
Saquisilí	Small	1 Trade	1
Total			33

Note: Table 2 shows the distribution of SMEs in the cantons of Pujilí, Salcedo, Latacunga, La Maná and Saquisilí, detailing their size, activity, category and the total number of companies in each canton.

For data collection, a questionnaire consisting of 25 questions was used. These questions will focus on knowledge, availability and resources, perception and attitude, and barriers regarding the use of digital tools as perceived by these companies.

This questionnaire was addressed to managers and administrative staff of SMEs. It was designed to provide detailed and relevant information about the adoption and use of digital tools in these SMEs, which facilitated the analysis of their impact and effectiveness.

Results and discussion

After applying the research instrument in SMEs in the cantons of Pujilí, Salcedo, Latacunga, La Maná and Saquisilí, 66 people were surveyed, of which 33 were managers and 33 administrative staff. These data allowed us to identify the use of digital tools for information management in these companies. Table 3 below shows the first dimension on knowledge and competence of digital tools for information management.

Table 3

Knowledge and competence of digital tools for information management

ID	Indicator	1	%	2	%	3	%	4	%	5	%	Total, of respondents
P1	Knowledge of digital tools	14	21.2%	2	3.03%	36	54.55%	10	15.15%	4	6.06%	66
P2	Team training	14	20.59%	24	35.29%	12	17.65%	10	14.71%	6	9.09%	66

P3	Understanding the advantages of digital tools	4	6.06%	6	9.09%	14	21.21%	34	51.52%	8	12.12%	66
P4	Update on digital tools	10	15.15%	28	42.42%	14	21.21%	6	9.09%	8	12.12%	66
P5	Regular use of digital tools	4	6.06%	14	21.21%	20	30.30%	12	18.18%	16	24.24%	66

Note:questionnaire results. Classification of responses: 1= Totally disagree; 2= Disagree; 3= Neutral; 4= Agree; 5= Totally agree.

It can be noted that the majority of respondents 54.55% do have a basic knowledge while others do not about digital tools for information management. The next highest percentage 35.29% believe that their work team is not trained. Also, a significant percentage 51.52% recognize the advantages of using tools for information management. On the other hand 42.42% are not aware of the latest updates of these tools. While, 30.30% regularly use digital tools in managing their company information. It can be said that there are significant areas of improvement in terms of training, updating and regular use, to significantly improve the competence and effective use of digital tools, effective training and development strategies would be implemented.

Table 4

Use and experience of digital tools for information management

ID	Indicator	1	%	2	%	3	%	4	%	5	%	Total, of respondents
P1	Project management tools	24	36.36%	30	45.45%	4	6.06%	8	12.12%	0	0%	66
P2	Tools for cloud storage	8	12.12%	6	9.09%	14	21.21%	28	42.42%	10	15.15%	66
P3	Data analysis tools	10	15.15%	10	15.15%	6	9.09%	16	24.24%	24	36.36%	66
P4	Customer relationship management software	16	24.24%	26	39.39%	8	12.12%	12	18.18%	4	6.06%	66
P5	Communication and collaboration platforms	10	15.15%	16	24.24%	20	30.30%	14	21.21%	4	6.06%	66

Note: Questionnaire results. Classification of responses: 1= Strongly disagree; 2= Disagree; 3= Neutral; 4= Agree; 5= Strongly agree.

It can be said that the vast majority of SMEs with 45.45% do not use project management tools such as Trello to organize their tasks. Another majority of respondents 42.42% use cloud storage tools such as Google Drive. Similarly, 36.36% use basic data analysis tools such as Excel to report their sales. On the other hand, respondents with 39.39% do not use customer service management (CRM) tools. Likewise, 30.30% of respondents use communication platforms such as Zoom and Google Meet from time to time. The results reveal that many SMEs still do not take full advantage of the digital tools available, which represents a significant opportunity to improve efficiency, information management and decision making.

Table 5

Availability and resources of digital tools for information management

ID	Indicator	1	%	2	%	3	%	4	%	5	%	Total, respondents
P1	Access to digital tools	10	15.15%	6	9.09%	12	18.18%	34	51.52%	4	6.06%	66
P2	Technological infrastructure	6	9.09%	12	18.18%	10	15.15%	28	42.42%	10	15.15%	66
P3	Budget	4	6.06%	24	36.36%	8	12.12%	20	30.30%	10	15.15%	66
P4	Sufficient staff	6	9.09%	20	30.30%	12	18.18%	16	24.24%	12	18.18%	66
P5	Hardware Equipment	6	9.09%	10	15.15%	18	27.27%	20	30.30%	12	18.18%	66

Note:questionnaire results. Classification of responses: 1= Totally disagree; 2= Disagree; 3= Neutral; 4= Agree; 5= Totally agree.

Most respondents, 51.52%, consider that they have adequate access to digital tools for information management. In addition, a good part (42.42%) believes that their technological infrastructure is adequate to support advanced tools, while for those companies whose infrastructure is not adequate. On the other hand, some SMEs remain neutral with 36.36%, they consider that they do not have an adequate budget to invest in these tools. On the other hand, 30.30% of respondents believe that they do not have enough staff to implement digital tools, in the same way 30.30% show that their hardware equipment would support digital tools for information management. It can be indicated that, although most SMEs have adequate access to digital tools and consider their technological infrastructure sufficient, there are still significant challenges in terms of budget, staff and hardware support, since, by using these digital tools effectively, it strengthens their competitiveness and efficiency in the market.

Table 6

Perception and attitude towards digital tools for information management

ID	Indicator	1	%	2	%	3	%	4	%	5	%	Total, of respondents
P1	Digital tools are essential for information management	0	0%	0	0%	1	15.15%	4	60.61%	1	24.24%	66
						0		0		6		
P2	Positive attitude towards the adoption of new technologies.	0	0%	2	3.03%	1	21.21%	4	60.61%	1	15.15%	66
						4		0		0		
P3	Commitment to implementation	0	0%	6	9.09%	1	18.18%	3	54.55%	1	18.18%	66
						2		6		2		
P4	Digital tools improve information management processes.	4	6.06%	0	0%	6	9.09%	4	66.67%	1	18.18%	66
								4		2		
P5	Digital tools facilitate decision making	0	0%	0	0%	1	21.21%	3	48.48%	2	30.30%	66
						4		2		0		

Note:questionnaire results. Classification of responses: 1= Totally disagree; 2= Disagree; 3= Neutral; 4= Agree; 5= Totally agree.

It can be observed that 84.85% consider that digital tools are essential for information management. Likewise, a majority with 75.76% has a positive attitude towards the adoption of new technologies.. Likewise, a high percentage of respondents (72.73%) are willing to invest time and resources in implementing these tools. In addition, 84.85% believe that digital tools improve information management processes. Finally, 78.78% of respondents agree that the use of digital tools for information management facilitates decision-making. It can be said that the positive perception and attitude towards digital tools in SMEs is a valuable resource that can be leveraged to promote their effective use, overcoming existing barriers and maximizing the benefits of digital transformation.

Table 7

Barriers and challenges of digital tools for information management

ID	Indicator	1	%	2	%	3	%	4	%	5	%	Total, of respondents
P1	Lack of knowledge	0	0%	4	6.06%	20	30.30%	16	24.24%	26	39.39%	66
P2	The cost of implementation	4	6.06%	8	12.12%	18	27.27%	20	30.30%	16	24.24%	66
P3	Resistance to change	0	0%	8	12.12%	4	6.06%	42	63.63%	10	15.15%	66
P4	Lack of training	0	0%	4	6.06%	8	12.12%	28	42.42%	24	36.36%	66
P5	Limitations of technological infrastructure	0	0%	8	12.12%	16	24.24%	32	48.48%	8	12.12%	66

Note:questionnaire results. Classification of responses: 1= Totally disagree; 2= Disagree; 3= Neutral; 4= Agree; 5= Totally agree.

We can interpret that 63.63% of respondents agree that lack of knowledge is a barrier to the implementation of digital tools. Similarly, 54.54% agree that the cost of implementation is a significant barrier for their companies. Also, 78.78% of respondents agree that resistance to change by staff is a challenge. Likewise, 78.78% also agree that lack of adequate training is a barrier and 60.6% of respondents agree that technological infrastructure limitations hinder the effective implementation of digital tools for information management in their company. Although these barriers and challenges are significant in SMEs, they can be overcome through adequate training, strategic financing, effective change management and investments in technological infrastructure, addressing these challenges will allow SMEs to improve their competitiveness and efficiency in the digital world.

Conclusions

- It is concluded that, currently, most SMEs in the cantons of Pujilí, Salcedo, Latacunga, La Maná and Saquisilí use basic tools for data analysis such as spreadsheets: Microsoft Excel, a powerful and versatile tool, but its predominant use indicates that many SMEs could benefit from adopting more advanced data analysis solutions, such as Google Analytics, Power BI or Tableau. Just as it was also shown that the tool they use the most is Google Drive, this indicates a recognition of the importance of having access to documents and data from anywhere, facilitating collaboration and flexibility.

- Furthermore, more than half of the respondents from SMEs in the cantons of Pujilí, Salcedo, Latacunga, La Maná and Saquisilí have a basic knowledge of digital tools; there is a clear need for additional training to raise this knowledge to more advanced levels. The fact that a significant part of the staff does not feel adequately trained highlights the importance of investing in continuous training programs.
- Furthermore, technological infrastructure and access to digital tools are adequate for a significant number of respondents, but not for all. This suggests that there is still work to be done in terms of updating and improving the technological resources available to these companies. Furthermore, the perception of inadequacy in adequate personnel and hardware equipment indicates areas where investment efforts should be focused.
- In this same sense, the SME surveyors showed a positive perception and attitude, which is favorable to encourage greater use of these technologies. However, converting this positive attitude into concrete and consistent actions requires sustained efforts in communication and leadership, which would be a boost to overcome the main barriers identified such as lack of knowledge, implementation costs, resistance to change and lack of adequate training, since these barriers must be addressed strategically.
- To overcome these challenges, it is suggested that SMEs implement ongoing training programs for their functions, establish alliances with local technology providers to facilitate solutions tailored to their needs, and policies that encourage investment in digital tools as an integral part of their business strategy. This will not only improve the operational and competitive efficiency of SMEs, but will also contribute to the sustainable economic development of the province of Cotopaxi through greater digital integration.

Conflict of interest

There is no conflict of interest.

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