

SIRE: Catalyst for Improvements in Accounting and Tax Processes

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Abstract

The Integrated Electronic Registration Systems have had a positive impact on the accounting and tax processes of SMEs. The article explored the impact of the Integrated Electronic Registration Systems (SIRE, from the Spanish initials) on the accounting processes of SMEs in Peru, comparing it with practices in Ecuador and Colombia. For this purpose, 60 professionals participated in the study, which used a quantitative approach and the application of a survey and document analysis. The results of the study were analyzed quantitatively and qualitatively, thus examining how digitalization affects the efficiency and accuracy of accounting and tax processes. In terms of correlation results, there is a 63.10% correlation between SIRE and the accounting processes, while there is a 56% correlation between digital transformation and the accounting processes. Key lessons for policy makers and system designers were identified, emphasizing future reforms to facilitate an effective digital transition. This paper contributes to understanding how digitalization improves the economic performance and tax compliance of SMEs, providing a basis for future research and strategies aimed at integrating these companies into the digital economy.

Keywords: *Electronic Records, Digitalization, Accounting Processes, Digital Transition, Competitiveness, Economic Efficiency.*

Introduction

In today's environment where companies are constantly evolving to grow their operations and maximize their profits, several governments have adopted measures for the development of electronic integrated systems that help to improve the tax compliance control of the various companies incorporated in their territorial domains. This is generated mainly by the deficiency that exists in the internal accounting process.

Anton (2023) mentioned that the use of electronic accounting systems in Romanian companies meant a digitalization of financial and accounting information, due to an improvement in communication with the Tax Administration, since the presentation of accounting and tax information to which these entities are subject is streamlined. The affiliation of accounting technologies by SMEs in Pakistan helped in the management and processing of accounting information within a given period and, in turn, has generated contributions in the efficient allocation of resources (Nassani et al., 2023). Organizations that implemented electronic systems improved the quality of the data set needed for barrier-free decisions (Erwin, 2019).

Therefore, the use of technologies, such as electronic accounting systems, benefited in the efficiency of management and accounting part of companies (Vărzaru et al., 2022). From the position of AbuAkel and Ibrahim (2023), 10% of companies in Jordan with an electronic system were benefited in tax returns. Also, new adjustments in the accounting information processing of European companies result in automation of the accounting cycle (Romanova, 2019).

Along the same lines, according to Pétchenko et al. (2023), Ukrainian companies used digital technologies to improve accounting efficiency and increase data security. On the other hand, in Turkey, an integrated system called IFMIS was used, which covers budgeting and accounting areas, benefiting in the digitalization of budget execution and accounting processes (Demirhan, 2020).

The problematic reality of the article focused on the evolution and adaptation of SMEs to the challenges and opportunities presented by digitalization, particularly in the context of accounting and tax administration. In recent years, the transition to digitalization has become an essential element for the

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efficiency and competitiveness of SMEs in the region. However, the adoption and implementation of the Integrated Electronic Registration Systems (SIRE) has varied significantly among Peru, Ecuador and Colombia, reflecting different approaches and levels of technological integration.

In Peru, a gradual transition to SIREs was observed, with efforts focused on enabling adequate adaptation by SMEs, in contrast to the generality of approaches in Ecuador and the presumption of a comprehensive strategy in Colombia, where the lack of specific data limits effective direct comparison. The variability in the implementation of these systems highlights a problematic scenario in which the lack of a unified approach and the absence of specific data in some regions make comparative analysis and generalization of effective practices difficult.

In turn, this research highlights the importance of personal and context-sensitive strategies for the implementation of e-recording technologies, suggesting the need for detailed consideration of the specific capabilities and needs of SMEs in different national environments. Thus, addressing the existing gap in current knowledge and practice, providing a basis for future studies and strategies aimed at improving the integration of SMEs into the digital economy - a critical step for their development and sustainability in the current global context. The general objective of the study was to analyze the influence of the Integrated Electronic Registration Systems (SIRE) on the accounting processes of small and medium-sized enterprises (SMEs) in Peru. Likewise, it was decided to consider as a general hypothesis that the implementation of the Integrated Electronic Registration Systems (SIRE) significantly improves the accounting and tax processes of SMEs in Peru.

Literature Review

In recent years, contributions have been made to the academic field regarding Integrated Electronic Registration Systems and about accounting processes in small and medium-sized enterprises. As stated by Cejas and Faz (2018), in Ecuador, 56% of companies that used accounting systems did have an impact on the company's accounting processes as they allow identifying information from transactions to Financial Statements - this is because the system stores all the data of the entity. The authors also identified that there is a 38% of companies that show an improvement in their accounting cycle because the Integrated Electronic Registration Systems | provide suitable information for decision-making.

Likewise, Otake (2022) discovered that the use of electronic systems in accounting information symbolizes a tool that benefits in the accounting activities of SMEs and in obtaining a relative advantage. He also mentions that the government can apply strategies to promote and encourage SMEs to adopt these systems. Oleiwi (2023) demonstrated that integrated accounting systems allow companies in Europe and Romania to exchange data and process accounting information effectively, this is because they make their accounting activity more automated and obtain truthful information free from human errors. Also, it was identified that in Brazil during the pandemic, companies adopted digital systems, benefiting them in terms of digitizing accounting transactions (Bokolo and Sobah, 2021).

Likewise, the authors Chyzhevska et al. (2021) observed that companies that evolved their accounting cycle was thanks to the application of an electronic system. Moudud-Ul-Huq, et al. (2020) pointed out that companies that changed their manual accounting for systematized accounting presented an accounting evolution. Li and Fang (2022) revealed that optimization in a company's electronic accounting system generates accuracy and authenticity in sales or purchasing information.

Finally, Vysochan et al. (2023) argued that electronic record systems provided a contrast to accounting information, because creating reports in electronic format is essential for organizations (Shmarova and Ignatova, 2023). Matskiv et al. (2023) discovered that blockchain technology in a company improves the effectiveness of accounting processes, the reliability of the integral system and reduces errors and fraud.

Regarding the conceptualizations of the variables, Malik and Saleh (2022) argued that an integrated system of records benefits in increasing the quality and credibility of the information and improving control levels. Likewise, it is also considered as an efficient program that generates satisfaction in the users of accounting

information because it provides high quality information and influences decision making (Mohammad et al., 2024).

In relation to this, according to Murthy et al. (2023) electronic record systems are a digital structure that allows accumulating, transferring and streamlining procedures within the accounting area of a company. Likewise, Qatawneh and Alqtish (2021) mentioned that an integrated electronic record system is one that helps to mitigate tax evasion based on a correct control of information processing.

Regarding the conceptualization of accounting processes, Gackstatter et al. (2019) pointed out that the accounting process involves the coordination and interaction of various business operations, which are meticulously structured and categorized with the objective of generating accurate and relevant data for decision making. This is to provide a complete and detailed picture of the company's financial and operating situation. Likewise, the accounting procedure is developed through transactions and records of economic events (Asatiani et al., 2019).

In addition, regarding the conceptualization of the dimensions, we can mention that digital transformation includes digital changes that increase the level of competitiveness of a company and generate a benefit in terms of increasing digital assets (Verhoef et al., 2021). Likewise, Wu (2024) argued that digital transformation is of great relevance to unify and promote the achievement of business objectives, because the adoption of technologies helps to renew the company's business model and the experience it provides to customers.

Also, developing the dimensions, we have the dimension of financial transfers, which are financial movements developed between companies and a banking entity. It is also defined as the vitality of a company due to the daily activities they develop (Lippi et al., 2020). On the other hand, with respect to decision-making, it is a stage that generally involves knowing the current scenario of the entity to be able to choose the most viable alternative, as well as the futuristic results of the decisions taken (Pacheco et al., 2023). Regarding the dimensions of accounting processes, the financial statements are comparative documents in which accounting information suitable for analysis is expressed and on the basis of this information, strategic decisions can be made (Durocher and Fortin, 2021).

On the other hand, in terms of economic activity, Lozada, et al. (2021) mentioned that economic activity is driven by entrepreneurs and refers specifically to new business approaches that use technological innovation to lessen the effects of poverty, reduce climate change and generally promote economic development while improving the environment.

Regarding financial behavior, Montaña and Ferrada (2021) pointed out that it encompasses actions related to capital management planning, the establishment of financial objectives, the monitoring of expenses, the practice of saving and preparation for unforeseen economic situations. In addition, it includes the choice of procurement decisions based on available resources and the timely fulfillment of financial obligations. Also, in the words of Farida et al. (2021), financial behavior is closely related to financial management and the ability to effectively manage finances as a crucial factor in acquiring success. Therefore, understanding financial management is essential for all individuals within society.

Methodology

The research was devoted to the collection of numerical information obtained through the application of a data collection technique, since it allowed an analysis based on statistical methods used to synthesize the information and validate the hypothesis. Likewise, the research has contributed to the provision of practical knowledge to the research community regarding the integrated systems of electronic records and accounting processes to be applicable in the improvement of efficiency in the generation of sales and purchase reports and the accuracy of accounting information. The research was conducted through the application of closed-question surveys and the analysis of official documents, providing an integral perspective on the adoption and effectiveness of these systems.

The selected sample included 60 professionals, equally distributed among accountants and lawyers from all over Peru, chosen by stratified random sampling to ensure representativeness. The surveys were administered through an online platform, which facilitated data collection and allowed for efficient analysis. Subsequently, the collected data were processed and analyzed using SPSS statistical software, where descriptive statistics and inferential analysis were carried out to interpret the responses. Validation of the survey instruments was ensured through a meticulous peer review process involving accountants and lawyers with extensive experience in taxation and accounting digitalization.

In addition, a pilot test was conducted with a small group of the target population to identify and resolve potential problems in the wording of the questions and the structure of the survey. The information obtained during this process was used to refine and validate the final questionnaire, thus ensuring its relevance and comprehensibility.

In addition to the surveys, the study included a comprehensive analysis of official documents to complement the information collected and provide a detailed context of the regulatory and operational framework related to the digitalization of accounting in the three countries. Various documentary sources were reviewed, providing a better understanding of existing policies and regulations and their impact on the implementation of SIRE in SMEs.

The theories that support the research were based on the Integrated Electronic Registration Systems and the accounting process. This is why Richard Mattessic's Accounting Information Systems Theory is mentioned, where Schiavi et al. (2024) postulated that it is a systematic approach within accounting. This theory is a concept that encompasses the digital transformation within the accounting area of a company using another institutional perspective.

On the other hand, Luca Pacioli's double entry theory was considered, where Breton (2018) pointed out that in a modernist approach, accounting theory is conceived as an essentially social activity that involves the interaction between those responsible for preparing Financial Statements and the users of such information, with the purpose of assisting them in economic activities and examining the financial behavior of organizations, always having to comply that each accounting entry must have an aspect and a counter aspect.

In terms of ethics, the research strictly adhered to ethical principles, ensuring the informed consent of all participants and maintaining the confidentiality and anonymity of the information collected. The study acknowledged several limitations, including possible bias in the survey responses and limited generalizability of the results due to the specific size and composition of the sample. These limitations were openly discussed in the research.

Results

The Integrated Electronic Registration System that was incorporated by the Peruvian Tax Administration represented a great step forward in the area of tax collection. According to the analysis of the systems in Peru, Ecuador and Colombia, it has been shown that there is a favorable progress for SMEs in Peru, since the implementation of SIRE facilitates the filing and declaration of monthly taxes. Table 1 shows the comparison of SIRE implementation practices in the countries mentioned above with the accounting processes of SMEs.

Table 1. Comparison Of the Implementation Practices of The Integrated Electronic Registration System and Their Impact on The Accounting Processes of Smes in Peru, Ecuador and Colombia.

Thematic code	Peru (SUNAT)	Ecuador (SRI)	Colombia (DIAN)
SIRE	It was implemented and had several postponements for its	The law describes general functions of the SRI	Electronic systems approach to improve tax efficiency.

	adaptation (RS N°258-2023, RS N°204-2023).		
TD	Delays signal transition to digitalization of accounting records (RS N°258-2023, RS N°204-2023).	Focus on modernization and revenue administration to increase revenue collection.	Implementation of digital platforms for tax management.
TF	Not specified.	Not specified.	Potential use of digital systems to facilitate tax payments and collections.
PC	SIRE affects how SMEs keep records of sales and revenue, gradually adapting (RS N°258-2023).	No specific approach.	Programs or systems to support SMEs in digital accounting management.
TD	Postponement for better preparation and informed decision making about electronic records (RS N°204-2023).	Tax policy committee defines guidelines, indirectly affecting corporate decision making.	Digital tools that inform business and tax decisions.
EF	Involved in the implementation of SIRE for accounting records.	Indirectly in the functions and management of the SRI.	Use of electronic systems for the presentation and analysis of financial statements.
AE	The implementation of SIRE could affect the way in which the economic activity of SMEs is reported and monitored. (RS N°190-2022).	Tax policies and controls affect overall economic activity.	Impact of digitalization on the reporting and monitoring of the economic activity.
CF	Changes in the SIRE could influence how SMEs financially manage their tax obligations.	Through tax management and control, the aim is to influence the financial behavior of taxpayers.	Influence of regulations and electronic systems on financial practices.

Note: SIRE Integrated Electronic Registration System; TD digital transformation; TF financial transfers; PC accounting processes; TD decision making; EF financial statements; AE economic activity; CF financial performance. (Translator's note: abbreviations - from top to bottom- come from the Spanish initials)

Table 2 and Table 3 show the descriptive analysis of the SIRE and the descriptive analysis of the Accounting Processes, respectively. This is based on the application of a survey using a Likert scale from 1 to 5, from strongly disagree to strongly agree, respectively.

Table 2. Descriptive analysis of the Integrated Electronic Registration System (SIRE) of the SMEs

	N	Mean	Median	Mode	Deviation	Range
P1	60	4.3	4	4	0.7	3
P2	60	4.3	4	4	0.7	3
P3	60	4.0	4	4	0.8	3
P4	60	4.3	4	4	0.7	3
P5	60	4.1	4	4	0.7	3
P6	60	4.1	4	4	0.8	3
P7	60	3.8	4	4	0.9	3
P8	60	4.1	4	4	0.8	3

P9	60	4.3	4	4	0.7	3
P10	60	4.2	4	4	0.8	3
P11	60	4.1	4	4	0.8	3
P12	60	4.1	4	4	0.8	3
P13	60	4.3	4	4	0.8	3
P14	60	4.3	4	4 ^a	0.8	3
P15	60	4.1	4	4	0.8	3
P16	60	4.1	4	4	0.8	3
P17	60	4.1	4	4	0.8	3
P18	60	4.2	4	4	0.7	3
P19	60	4.1	4	4	0.7	3
P20	60	4.1	4	4	0.7	3

Note: This table contains descriptive information on the SIRE for each item.

Table 3. Descriptive Analysis of The Accounting Processes of The Smes

	N	Mean	Median	Mode	Deviation	Range
P21	60	4.1	4	4	0.8	3
P22	60	4.2	4	4	0.8	3
P23	60	4.3	4	4	0.7	3
P24	60	4.2	4	4	0.8	3
P25	60	4.0	4	4	0.8	3
P26	60	4.0	4	4	0.8	3
P27	60	4.0	4	4	0.9	4
P28	60	4.1	4	4	0.8	3
P29	60	4.0	4	4	0.8	3
P30	60	4.1	4	4	0.8	3
P31	60	4.1	4	4	0.7	3
P32	60	4.2	4	4	0.6	3
P33	60	4.0	4	4	0.8	4
P34	60	4.0	4	4	0.8	3
P35	60	4.0	4	4	0.9	3
P36	60	4.1	4	4	0.8	3
P37	60	4.1	4	4	0.7	3
P38	60	4.2	4	4	0.8	3
P39	60	4.1	4	4	0.7	3
P40	60	4.3	4	4	0.7	3

Note: This table contains descriptive information of the accounting processes for each item.

Table 4. Correlations Between the Sire and Its Dimensions with The Accounting Processes of Peruvian Smes.

		PC	EF	AE	CF
SIRE	CC	63.1%	54.4%	68.6%	70.0%
	SB	0.000	0.000	0.000	0.000
	N	60	60	60	60
TD	CC	56.0%	58.0%	61.3%	62.1%
	SB	0.000	0.000	0.000	0.000
	N	60	60	60	60
TF	CC	70.5%	62.3%	75.3%	80.2%
	SB	0.000	0.000	0.000	0.000
	N	60	60	60	60
TD	CC	64.1%	56.2%	84.2%	58.7%
	SB	0.000	0.000	0.000	0.000
	N	60	60	60	60

Note: SIRE Integrated electronic records system; TD digital transformation; TD Decision making; TF financial transfers; PC accounting processes; EF financial statements; AE economic activity; CF financial performance.

(Translator's note: abbreviations come from the Spanish initials)

Discussion

The comparison among Peru, Ecuador and Colombia reveals significant variations in the adoption of the Integrated Electronic Registration Systems (SIRE), illustrating different national strategies towards accounting digitalization in SMEs. In Peru, gradual adoption, characterized by postponements, could be interpreted as a strategy to facilitate the transition of SMEs towards digitalization, an approach that, although slower, seeks to mitigate negative impacts (Cejas and Faz, 2018). This contrasts with Ecuador, where the lack of specific approaches towards SIRE suggests a more general and less focused modernization perspective. In Colombia, the apparent comprehensiveness of its approach stands out, but the scarcity of specific data prevents an effective direct comparison, pointing to a significant research gap that needs to be addressed.

Regional variability highlights the importance of contextualizing digitalization within tax and accounting strategies, supporting the findings of Otake (2022) and Olewi (2023) on efficiency and transparency enhanced by automation. However, adaptation to specific national contexts emerges as a critical element for the success of these initiatives.

The positive perception of Peruvian SMEs regarding the implementation of SIRE reflects a growing trend towards digitalization, consistent with previous literature (Cejas and Faz, 2018; Otake 2022). However, the adoption of these technologies also highlights the challenges of training and resistance to change, underlining the need for balanced strategies that address both technological and human aspects (Moudud-Ul-Huq, Asaduzzaman and Biswas 2020; Li and Fang 2022).

The results regarding the correlation of our variables show that the SIRE has a positive impact on the Accounting Processes, since 63.1% of the respondent's mentioned acceptance of the premises formulated regarding the improvement of the accounting and tax processes based on the use of the SIRE. Likewise, regarding the dimensions of Financial Statements, Economic Activity and Financial Behavior, which were formulated in the survey, 54.4%, 68.6% and 70% respectively were obtained, which we can interpret that these three dimensions also have a positive impact for the SMEs. That is why the correlation between SIRE implementation and accounting and tax improvements in SMEs supports the integration of digital technologies as beneficial for business operations and strategy (Vysochan et al., 2023; Matskiv et al., 2023). However, it is highlighted that digitalization, although crucial, is not the only factor in business

modernization. These results reinforce the importance of holistic approaches that consider multiple aspects of digital transformation.

These discussions underline the need for customized and well-founded strategies for digitalization in micro, small and medium-sized enterprises, taking into account the peculiarities and needs of each national context. In addition, a clear research gap in the comparability and generalizability of digital approaches is revealed, marking an essential direction for future studies.

The identified limitations, such as the variability in responses and the limited sample, urge caution in generalizing and point to the need for detailed future research that considers various factors affecting the perception and adoption of these technologies.

Conclusions

The research highlights the fundamental importance of digitalization in the accounting processes of the SMEs in Peru, Ecuador and Colombia. It has been observed that each country adopts different strategies towards the implementation of Integrated Electronic Registration Systems (SIRE).

While Peru shows a cautious and gradual transition, Ecuador shows a more general approach to administrative modernization without focusing on specific SIRE details. In contrast, Colombia appears to take a more integrated approach, although the research notes the lack of specific data to support this approach.

The conclusions underline the critical need for digitalization policies and systems adapted to the specific needs and capabilities of SMEs in different national environments. The importance of establishing clear and efficient regulatory frameworks that facilitate a smooth digital transition is highlighted as well. The research also points to important gaps in data availability, especially in the case of Colombia, underscoring the importance of future research for a deeper analysis of the long-term impact of these systems.

In addition, the results reveal a generally positive perception among Peruvian SMEs about the implementation of integrated electronic records systems, indicating a growing trend towards the adoption of digital technologies. However, the importance of facing challenges such as the need for training and resistance to change is highlighted. The variability in responses and the limited sample of the study suggest the need for caution in generalizing the results, while pointing to important opportunities for future research in specific areas that influence the adoption and perception of these technologies among SMEs.

The correlation between the implementation of integrated systems and the improvement of economic efficiency and accounting processes highlights the beneficial impact of digitalization on business management. The results support the idea that digital technology is essential for the competitiveness and sustainability of SMEs, highlighting the need for informed decisions and transparent financial processes. This research acknowledges its limitations, including the representativeness of the sample and the variability of responses, highlighting the importance of future studies that explore the influence of variables such as industry sector, organizational culture and level of digital maturity. In addition, it is suggested that future research should delve deeper into the long-term impact of digitalization on the profitability and sustainability of SMEs and that additional comparative studies should be conducted to understand global trends in technology adoption.

This study contributes significantly to the current knowledge on digital transformation in accounting and financial management, providing valuable guidance for policy makers, technology developers and business leaders facing the challenges of the digital era.

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