



Digital Accounting In Pursuit Of Environmental Sustainability

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Abstract. *The research paper discusses the findings of the literature of previous studies related to accounting digitization to achieve environmental sustainability for the period from 2013 to 2023. The conclusions of the research literature show how the concept of modernity and the importance of digitization in accounting has evolved over the past few years in shedding light on different destinations and topics in the field of decision-making and environmental protection. The findings appears that researchers pointed to the urgent need to link research disciplines that would lead to increased interest in clean energy by involving experts in leading the digital transformation of accounting to legitimize the work of accountants. This research paper also referred to the results of the literature of studies regarding the interaction between various fields, especially sustainable accounting and accounting information systems, where the role of digital accounting in achieving sustainability, which is an integral part of a network of human and non-human actors that reflects economic activities on the environment. New research must also take into account that technology alone cannot solve environmental issues in isolation from the interactive role with humans who jointly seek solutions. Therefore, automating the work of accountants interested in corporate social responsibility issues through digital accounting can be one of the main pillars of that interaction in order to improve decision-making to protect the environment.*

Keywords: *Digital Accounting; Environmental Sustainability; Corporate Social Responsibility.*

1. INTRODUCTION

The research paper seeks to answer the main question related to the importance of digital accounting in achieving environmental sustainability by systematically relying on a review of the current literature, as many decision-makers, researchers and those interested in protecting the environment realize that the technological transformation of digitization is very important in becoming part of the solution (Jørgensen et al., 2023; Salem et al., 2021), however, the poor use of advanced technological may also contribute to exacerbating the problem (Alcott, 2005).

The significant transition from traditional manual accounting to the use of digital computers has had a significant impact on the speed, quantity and accuracy of extracting information and reports with superior quality (Murthy, 2018). Therefore, if understood and used correctly, this transformation will have a role in achieving culturally, socially and economically different sustainability goals. Many researchers have highlighted the importance of interdisciplinary twinning (Jans et al., 2022). However, researchers have shown that that accounting science may face in integrating new technological technologies (Dechow & Mouritsen, 2015; Quattrone, 2018). In addition, there has recently been a need to integrate multiple sub-areas of accounting such as accounting information systems and sustainability accounting to ensure the production of high-quality (Jans et al., 2022).

The aim of this research paper is to systematically document the current studies regarding digitization and sustainability in accounting, analyze the content and results identified in those researches, and indicate the additional needs and trends expected. To achieve this goal, the research will work on a systematic review, relying on PEISMA.

2. METHODOLOGY IN RESEARCH STRATEGY

This paper analyzes and reviews the methodological literature that applies PEISMA. This tool is well accepted for conducting methodological reviews and presenting the most (Moher et al., 2010) important conclusions related to it. Three commonly used databases (IEEE, Scopus, and Web of Science) were selected to test articles related to the subject of the study published between 2013 and 2023. Table 1 explains the keywords related to the three selected databases. It clarifies the screening process and exclusion criteria for the PEISMA methodology in order to identify, sort, and qualify the study data for approval. The research initially identified a total of 182 studies from the three selected databases, as 49 studies were from IEEE and 66 from Scopus, while the Web of Science website reached 67 studies and as shown in Figure (1), as the research was conducted only in English.

Table 1. Keywords and used filters linked with the databases

Search terms	Databases name
accounting; digitization; technology and sustainability(abstract). 2013–2023 (year)	IEEE
accounting; digitization; technology and sustainability(abstract). 2013–2023 (year)	Scopus
accounting; digitization; technology and sustainability (topic. 2013–2023 (year)	ISI Web of Science.

Source: Authors

3. EXTRACTING AND ANALYZING THE DATA

As shown in Figure (1) the number of articles and research papers after filtering and sorting the research to reach the final number of 135 published articles, as the included studies were analyzed and coded according to the authors, the year of publication, the title of the study, the journal, the country as well as the field of research, and the detailed data for each study were placed in Excel and reviewed by the researchers (Antonini, 2024). In addition, a subset of published articles related to the field of business administration and economics were analyzed and coded taking into account the subject, goals, scope and objectives of the journal in which these studies were published. The purpose of this coding is to find out the topics reached by researchers and to indicate the most important journals

that lead this study. Journals were divided and distributed according to their goal and scope in accounting, economics, finance and management. In addition, it was verified whether or not these journals belong to a specific sub-domain and implicit of accounting systems or sustainability accounting, according to which a methodological principle (Maurizio Massaro, John Dumay, 2016) was used to design the review of the previous literature and as in Figure (1).

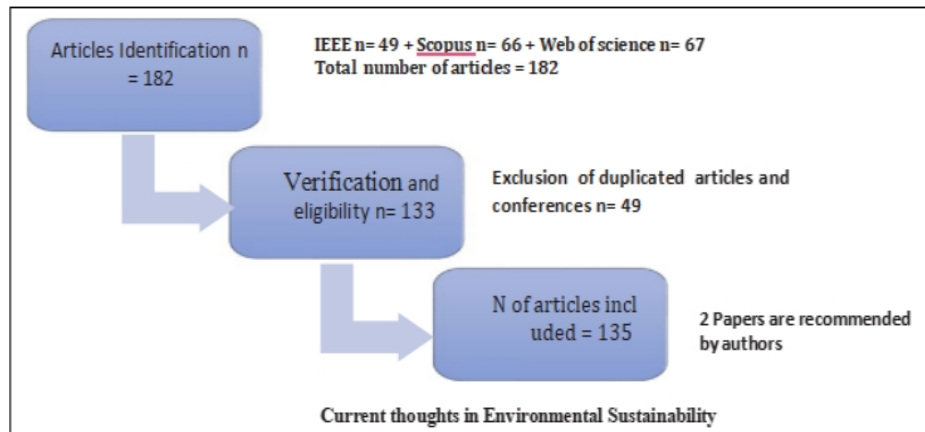


Figure 1: Flowchart of the study's methodology by The PEISMA

4. DIGITAL ACCOUNTING IN PURSUIT OF SUSTAINABILITY - OVERVIEW

The published research papers were reviewed and analyzed between 2013 and 2023, and the current research has many advantages, the most prominent of which are:

First: The novelty and importance of the title as shown in figure 2, where the development in the period under analysis and study, which states the significant increase in relevant topics, as more than 86% of the study sample was published in recent years. Around 115 articles out of 135 papers were published in the last four years. (Antonini, 2024).

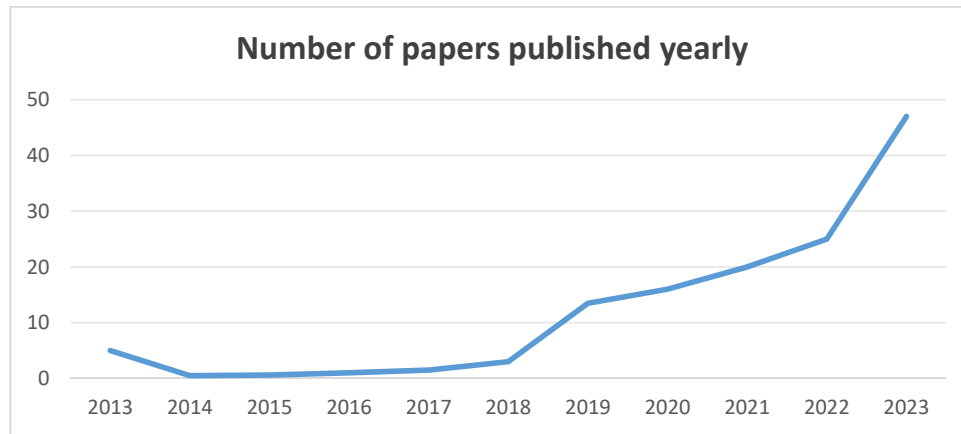


Figure 2: Documents of publications yearly

Second: This research is not limited to a specific subject area, but exceeds approximately 16 topics, including but not limited to environmental sciences, business management, accounting, economics, engineering, energy, and computer science, as in the figure 3. It should be noted that more than 56% of published studies focus on three subject areas, 20% are based on environmental sciences, business, management, and accounting got about 16%, while econometrics and finance reached the equivalent of 14%

Third: Although this study is not based on a specific country, two countries in particular, China and Russia, occupied a cumulative percentage equivalent to 10% of the study, as shown in figure 4, as China obtained about (12%) and Russia on (10%), followed by Ukraine in the third place by less than (9%), India in the fourth by (8%), the United States and the United Kingdom, reaching only (7%) , and the rest of the countries, such as Malaysia and Australia, down to Spain, reached percentages of less than (6%). It is worth mentioning that this review relied on the English language in the search and verification process, but the two countries above with a greater percentage do not speak English.

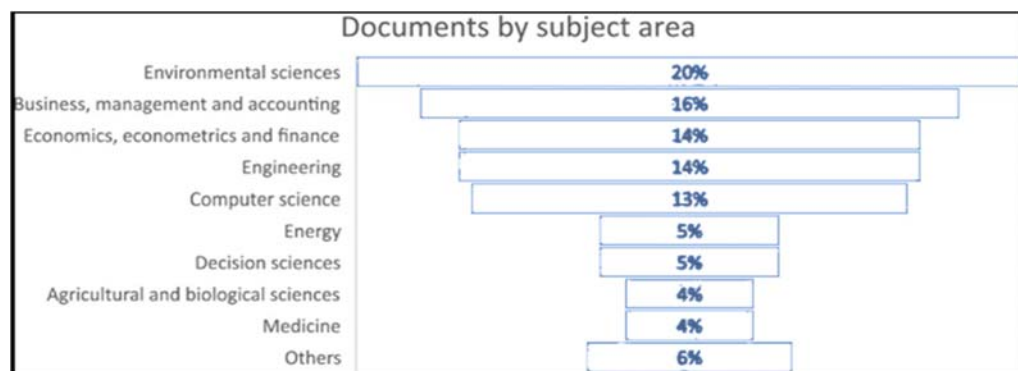


Figure 3: Articles by subject area

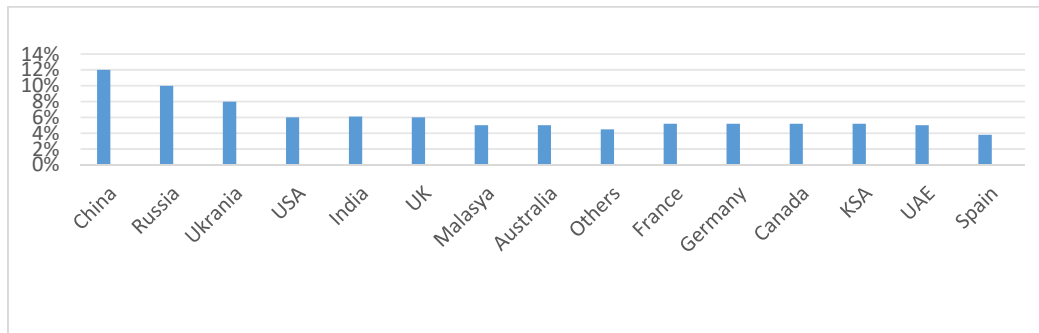


Figure 4: Publications by Country

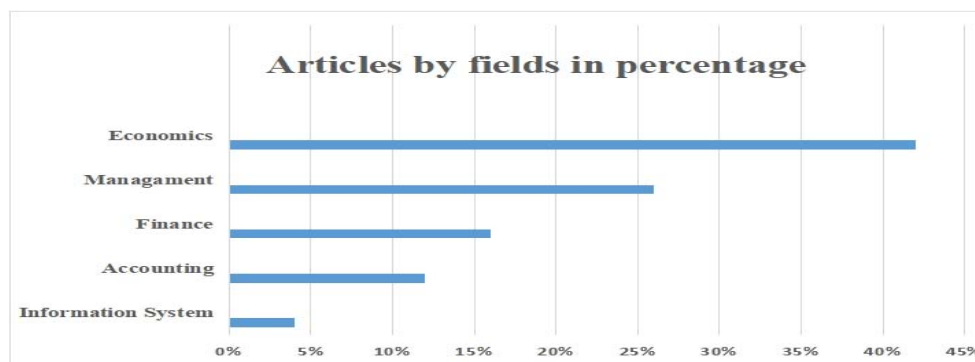
5. REVIEW AND ANALYZE A SUBSET OF STUDIES RELATED TO THE FIELDS OF BUSINESS AND ECONOMICS

The remodeled work has three characteristics:

First: It is not generally limited to a specific issue, but relates to a wide range of studies related to financial reporting (Phornlaphatrachakorn & Kalasindhu, 2021; Zhang & Zhao, 2023), performance measurement (A et al., 2023; Cai, 2023), teaching the basics of accounting (Guşe & Mangiuc, 2022; Tsiligiris & Bowyer, 2021), and the role of accountants in digitization (Kokina et al., 2019), financial technology (Çera et al., 2020; Kant, 2021), information systems (Abu Afifa & Nguyen, 2022), sustainable urbanization (Jena, 2021; Sergi et al., 2019).

Second: It is not generally limited to a specific category of researchers/journals, as researchers of this paper have found that economic journals are accustomed to publishing articles related to measuring performance in environmental economics (Ahmed, 2022; Fleming et al., 2022), and then journals with a financial specialization that publish various accounting topics related to financial technology (Çera et al., 2020; Kant, 2021), and it is suspicious that the researchers also discovered that information systems journals have published only two articles and six articles only in journals with an accounting specialization, and accordingly, Table 2 clarifies the number of articles within different fields - areas of publication.

Table 2. Accounting digitization for sustainability into the business and economics subject areas.



Remarkably, researchers have also discovered that journals specialized in economics, management and finance publish more research on digital accounting in the search for sustainability than in accounting journals. In addition, only one paper has been published in journals specialized in sustainability accounting (Cho et al., 2020).

6. REVIEW SOME SELECTED RESEARCH

Before going into the details of previous studies, it must be noted that the current work cannot be accurately classified as this topic has changed radically in the past four years. In other words, the results that rely on the technology designed and available four years ago may not be applicable in today's studies and research. However, it is possible to highlight the various topics that have appeared in previous studies related to the digitization of accounting followed by those related to environmental sustainability.

First: One of the lessons and lessons discussed in previous studies regarding management accounting as a sub-field with regard to digital transformation and its impact on accounting as a main field (Knudsen, 2020), as the researcher indicated that new accounting systems go beyond transactions (Bhimani, 2018), operations and accounting, and also highlight that new developments in social media interact and clearly affect accounting (Agostino & Sidorova, 2017; Scott & Orlikowski, 2014). However, they claim that the lack of knowledge in digital transformation may affect the legitimacy of the work of accountants, which may be a fundamental reason for the lack of necessary information in the decision-making process.

On the other hand, a number of researchers highlight the impact of digitization in terms of opportunities and challenges, not only in terms of the work of companies, business design, and the exercise of strategies and control (Bhimani, 2018, 2020; Möller et al., 2020).

According to researchers, digitization has become an important (Bhimani, 2018; Frey & Osborne, 2019) factor in the emergence of new forms of communication between companies, suppliers, customers and employees in order to read what the market demands of new goods and services. Therefore, there must be enhanced expertise in technology and analysis skills for those working in the accounting profession, in particular layoffs (Bhimani, 2018).

Second, digitization has accelerated the methods of accounting searches with greater accuracy. Although technology in the past years has contributed to the provision of huge amounts of information, digitization, the lifting of big data and blistering processes have opened new horizons in answering questions that we did not realize existed (Markham et al., 2018). It is worth mentioning that the availability of new forms of data that were not previously available has contributed to the possibility of exploring information directly within theoretical frameworks based on accounting principles instead of following up and searching in hypothetical and deductive ways, which may not be without errors (Murthy, 2018)

Third, new studies related to the sub-fields of sustainability accounting have emerged, which aimed to establish and implement new forms of resource accounting tools and practices to implement what is known as the circular economy. In addition (Jørgensen et al., 2023), a new sustainability accounting indicator has been introduced to measure frequent services and products based on the artificial neural network. Moreover (Forrest Fabian Jesse, Carla Antonini, 2023), with regard to the sub-field of accounting information systems, the results of new studies have provided the possibility of linking irrigation-related information systems with agricultural accounts in order to analyze and improve decisions related to the optimal use of scarce (Sharma et al., 2022) water. (Tingey-Holyoak et al., 2022) This has contributed to the possibility of establishing a framework containing digital technologies used to provide environmentally friendly services and products by achieving The European Green Deal in 2020. This would not have been possible without the use of technologies and big data analysis to positively modify those data by integrating sustainability information into accounting information reports (Jena, 2021).

7. CONCLUSION

This research paper discussed the literature of previous studies related to the digitization of accounting to achieve environmental sustainability for the period 2013 to 2023. The conclusions of the literature of studies reflected how the concept of modernity and the importance of digitization in accounting have evolved over the past years because of the interest of researchers and authors in shedding light on different destinations and topics. Many researchers have pointed to the urgent need to link research disciplines that would lead to increased interest in clean energy by involving experts in various fields, led by sustainable accounting and accounting information systems.

It is noteworthy (Antonini, 2024) that the role of digital accounting in order to achieve sustainability is an integral part of a network consisting of human and non-human actors, reflecting economic activities on the environment. (Antonini, 2024) Technology alone cannot solve environmental issues. New research shows that technology alone cannot solve environmental issues in isolation from the interactive role with humans. Therefore, the role of accountants interested in social and environmental responsibility accounting issues through digital accounting can be one of the main pillars of that interaction in order to improve decision-making for environmental protection.

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