

# Bibliometric Analysis of Cloud Accounting Phenomenon - Part I -

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## Abstract

*The information paradigms defining contemporary society call for the character of plurivalence through their omnipresence in multiple areas of activity. Their ubiquitous character provides the basis of the accounting-computer science interdependence, the undeniable reality being marked by the computer indispensability in the professional accountant's life. In this way, specialized literature becomes all-encompassing by the approaches marked by complexity and density regarding the issues of modernizing the accounting by its massive computerization. The cloud accounting phenomenon is a component part of the innovative changes that accounting has undergone lately.*

*The research paper aims to outline the bibliometric universe of the cloud accounting concept based on the methods, tools and techniques subscribed to bibliometrics in view of reflecting its representativeness through the lens of specialized literature. The results thus obtained consolidate the emblematic character of the cloud accounting issue in light of the massive interest manifested for its thoroughness and exploration equally by researchers, theoreticians, and practitioners. The study also stands out for its originality, being currently the only one dealing with issues of cloud accounting concept bibliometrics. The attribute of uniqueness of this paper is defined by shaping the research universe assigned to the phenomenon based on specialized literature, identifying the manner to reshape the profession and the field by changing the digital paradigm and illustrating the representativeness of technology in the academic community through the perspective of the bibliometrics tool. Likewise, an element of novelty is given by highlighting the definition of cloud accounting from the author's perspective based on the image provided by the literature review.*

**Keywords:** cloud accounting, bibliometrics, analysis, mapping, representativeness

**JEL classification:** M41, M49, O33

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## ➔ Research universe related to cloud accounting phenomenon

The irreversible process of digitization that permeating every aspect of human activity has both positive and negative consequences, with many threats as well as opportunities. The accounting field is greatly impacted by the accelerating digitalization process. The study of accounting information digitization at the core of the corporate environment's digitalization is a current topic with significant implications for organisational structure. (Kovalevska *et al.*, 2022) Accounting function and task digitization is an issue of current relevance within academic communities or for business stakeholders. Against the digital evolution backdrop of information technology, we

note the appearance of concepts devoted to the accounting field, including e-accounting, cloud accounting, big data or artificial intelligence. (Bajan & Lazari, 2019)

Accounting has evolved in parallel with information technology, which provides foundations for easier adaptation to digital order transformations at a faster pace than other areas of activity (Kraus *et al.*, 2021). The ongoing dual collaboration towards strengthening the accounting-informatics relationship generates the interdependence of the accounting field and modern information technologies. Releasing accounting to the new trends of modernity preserving the field's relevance in a society that is undergoing constant change.

Through this paper research, we propose to illustrate the impact of modernity's elements on financial and accounting processes through the interest of researchers for exploring informational accounting paradigms through specialised studies, research, and analysis. Cloud accounting phenomenon, as an essential pillar of reshaping the accounting field and implementing changes in the economic paradigm, has a good representation in specialised literature due in significant proportion to the digitization processes acceleration against the backdrop of the latest events appearing on economic environment scene. The research objectives are: **O1** – identifying how the literature outlines the cloud accounting phenomenon and how the accounting paradigm has changed as a result of its adoption in accounting functions and tasks and **O2** – identifying the representativeness of cloud accounting technology degree based on the use of bibliometric method. The second objective of the paper is divided as follows:

✓ **O2.1** – the two-dimensional emphasis of research on the issue of cloud accounting through recognition of annual scientific production that is both generalised (in publications) as well as customised (author's scientific production);

✓ **O2.2** – highlighting the research's relevance in the field of cloud accounting by showing the most important publications, the most important articles related to the study's theme, the authors who are most relevant based on the volume of publications they have disseminated, the most important affiliates, and the most significant keywords;

✓ **O2.3** – highlighting the most cited publications as well as the most cited areas within the cloud accounting research domain;

✓ **O2.4** – shaping the historiographical network;

✓ **O2.5** – identify regional collaboration on cloud accounting research;

✓ **O2.6** – evaluating current research trends in order to direct future private research directions around the phenomenon of cloud accounting;

✓ **O2.7** – mapping the conceptual structure of the cloud accounting technology;

✓ **O2.8** – highlighting the sources distribution according to Lotka's Law and Bradford's Law.

Therefore, one of the main goals of this study is to achieve the objectives mentioned and to highlight the originality of the research carried out.

### ➔ Literature review of the cloud accounting phenomenon

Technological advances and obtaining timely information rapidity are changing the way of performing accounting (Stoica & Ionescu-Feleagă, 2021).

A recent pandemic that has affected humanity as a whole has significantly accelerated the process of digitalization. The impact on accounting has been attributed to the broad reform of the field through the adoption of a wide range of contemporary information technologies.

Since the board of directors, together with the management structures, is constantly working to optimise the architecture of the digital systems in the accounting and finance area, the use of modern technology in accounting is under the umbrella of familiarity rather than progressiveness. Digitisation is considered the third

phase of technological evolution, with pragmatic implications for accounting functions and tasks. Among the modern trends in the accounting digitisation are identified solutions based on cloud functionalities. (Fülöp *et al.*, 2022)

Cloud computing applications possess many characteristics with traditional ones. The primary distinction is represented by the data hosting method, where data is stored on remote servers similar to the Software as a Service (SaaS) business model (Certinia, 2023).

Cloud accounting software revolutionises the efficiency of accounting procedures and facilitates financial operations management by enabling real-time visualisation of financial and accounting reports, thus facilitating managerial decision-making (GoCardless, 2023).

Cloud computing enables the fulfilment of fundamental accounting tasks, such as managing and balancing accounts, through the use of cloud-hosted applications built on a service-oriented paradigm. Cloud accounting software runs on a cloud service provider's platform and is not hosted on the client's local servers (Oracle NetSuite, 2021).

Cloud accounting facilitates the online management of accounting records to promptly and accurately reflect the components that show the company's performance and financial status (Xero, 2023).

Cloud accounting software stores financial-accounting data through remote servers, so access to it is unrestricted by time or space factors (NerdWallet, 2024).

Using an accounting system that can be accessed online is known as cloud accounting (FreeAgent, 2024).

In the business world, moving to innovative cloud accounting systems is a beneficial solution to increase the productivity of the accounting professional's work by optimising the processing of time-consuming data to direct it towards data analysis and involvement in the company's decision support system (CTL Consulting, 2024).

The cloud accounting application built for the purpose of hosting data via remote servers helps encrypt financial information to ensure its protection and confidentiality as well as guard against cyberattacks (Forbes Advisor, 2023).

Cloud accounting can be likened to a popular subject in the tech world over the past ten years, the idea behind it has had a profound impact on business owners (MYOB, 2021). Cloud accounting involves accessing an online system that is spatially and temporally autonomous based on internet connection. Modern systems cover a vast range of domain-specific duties and functionalities, even though they are designed to execute basic accounting operations (AccountsIQ, 2024).

Innovative paradigms adoption and transformation are inevitable in the accounting world. Accounting has adopted the digitalization and automation trend in order to meet the demands of the market for large-scale transactions. Against this backdrop, a gap in the specialised literature regarding the factors governing the implementation of digitalization phenomena, including cloud accounting, is noticeable. (Wicaksono *et al.*, 2020)

Modern paradigm of information technology, cloud accounting is one of the practical ways that address the distinctive financial management challenges that businesses face in the modern era. Organisational processes leading to the adoption of the postmodernist movement are influenced by factors related to the technological background, user expectations, organisational culture, and external and internal environment of the company. (Bachtiar *et al.*, 2023)

The widespread use of the "Internet +" model and other emerging technologies has led to the phenomenon of cloud accounting evolving and shaping the trend of growing accounting information digitalization within organisations. Thus, cloud accounting becomes a defined paradigm of "Internet + Accounting", with numerous applications, revealing a significant potential for complex accounting reform. (Deng & Xu, 2019)

The implementation of cloud computing inside information systems for accounting contributes to stimulate the organisational accounting information structure. Cloud accounting technology is a valuable instrument for

streamlining organisational processes (Feng, 2015). Based on the significant technological advancement, cloud accounting is no longer an idealistic goal but rather an essential measure for organisations looking to keep up with modernity and maintain their relevance in an increasingly digitalized world.

Cloud accounting refers to a type of cloud computing accounting software that is only accessible via the Internet. This kind of software isn't hypothetical, rather it's an essential resource shaped by organisational needs for the financial accounting data development and application, which represents a necessary step in creating a system for managerial decision-making. A cloud-based accounting system is essential for ensuring the development of business success since it manages financial activities, records accounting transactions, analyses data, and evaluates business performance in support of the management system's decision-making. (Saha et al., 2020) The world of accounting is changing dramatically as a result of the implementation of new modern information technology.

A conceptualization of the accounting system can be visualized as follows.

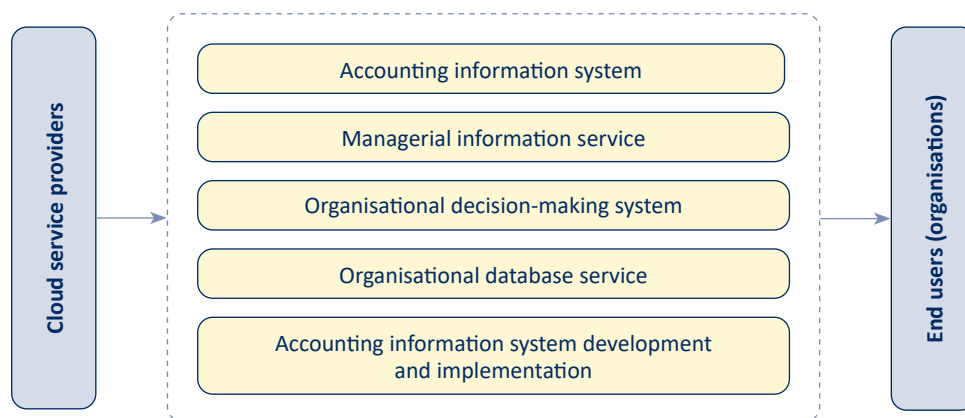


Figure 1. Cloud accounting phenomenon conceptualization

Source: Feng, 2015, p. 209.

The figure above shows the accounting information system and how the cloud accounting phenomenon is taking shape. Cloud accounting technology involves the presence of two essential components represented by cloud service providers and end users of accounting information. It focuses on supporting the company's managerial and financial system in order to assist the decisions taken by management structures. The components presented above show the collaboration on the accounting-informatics relationship. The usage of cloud computing in accounting is enabled by cloud service providers who facilitate the online accounting system's implementation. As a result, cloud accounting solutions revolutionise the entire organisational process environment by changing the method by which accounting tasks and functions are reported. (Dimitriu & Matei, 2015)

Cloud accounting belongs to the category of disruptive technologies with major implications for the business environment by revolutionising the way accounting systems are viewed and used within companies (Ma et al., 2021).

Cloud services, which offer numerous advantages to end users for online business management, especially in accounting, have been accelerated by the information technology revolution and the COVID-19 pandemic. For instance, because cloud accounting provides widespread access to scalable resources, it significantly reduces IT investments. (Saad et al., 2022)

The implemented shift of accounting departments to cloud-based solutions is being driven by a three-way interaction, as illustrated in Figure 2.

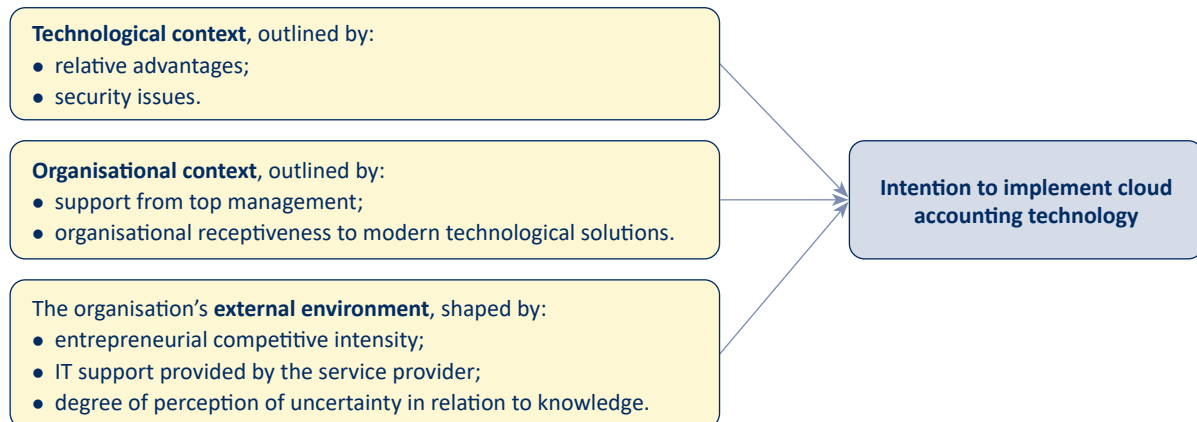


Figure 2. Determinants of the cloud accounting implementation process

Source: Saad *et al.*, 2022, p. 6.

Therefore, the purpose of the above figure is to illustrate the primary factors directing the shift towards the cloud phenomenon's acceptance on the tasks and functions side of accounting. Three contexts – the external environment of the entity, the organisational culture, and the technical environment – have a real impact on the implementation process.

The technological context's efficiency is compared to the benefits that can be found as a result of using the cloud phenomenon as well as the uncertainties surrounding the cybersecurity issue, which develop from the rise in cyberattacks in the last decade. For instance, the corresponding benefits are reflected in the scenario where the company saves money and time – a factor identified in maximising activity productivity. In essence, security concerns are about how much an online platform can raise questions about how data transmission and digital engagement are conducted. (Saad *et al.*, 2022)

The organisational context involves the culture of the business as it relates to the management structures that support the acceptance of disruptive technologies and the organisational receptivity related to the degree of readiness of the entity for adjusting to innovations of an information-based solutions. Organisation receptiveness to the adoption of state-of-the-art paradigms is closely related to the degree of company digitalisation assessed at the time of implementation.

The key elements that characterise the company's external environment are the pressures of competition, perceived knowledge uncertainty, and vendor support for cloud services. The integration of new technologies into business models can be accelerated by competitive pressure. Cloud-based solutions are more likely to be used by organisations possessing mid-level competitiveness. (Saad *et al.*, 2022)

Success in applying cloud systems is defined by the quality of the partnership between the cloud service provider and the company, collaborating with subject matter experts is essential. Uncertainty related to the lack of knowledge in the area of modern information technologies can be one of the main causes of achieve the stipulated goals failure.

The notion of cloud accounting is emerging due to the integration of cloud computing technology with accounting services and systems. Its self-contained dimension, illustrated in the following picture, is not acknowledged in the conceptualization of the phenomenon.

Thus, the idea of cloud accounting, or online accounting, emerged from applying the distinctive features of cloud computing technology to accounting operations and processes. In order to handle financial accounting data and create the foundation for the transfer of procedures, operations, information, and data to a remote system, cloud accounting is a type of application with cloud functions.

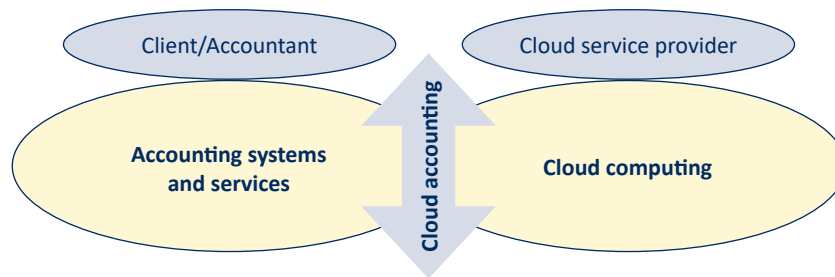


Figure 3. Cloud accounting phenomenon conceptualising

Source: Yau-Yeung *et al.*, 2020, p. 4.

On a personal note, we believe that the phenomenon of cloud accounting can be defined as follows: as a technology that shapes accounting processes at the intersection of accounting functions and tasks with cloud computing, cloud accounting falls into the category of contemporary paradigms that have shaped accounting.

### ➔ Conceptual landmarks of scientific research methodology

Greater solicitude, from numerous viewpoints, is required of the novice or senior researcher due to the scope and complexity of the study approach. The individual's fundamental aspiration to knowledge is twofold, on the one hand, from the perspective of seeking to discover the truth, and on the other, from the perspective of transforming the world in response to his desires and aspirations. Human existence is closely linked to the action of knowing the world around us, which is what makes scientific research so significant. (Ristea & Valeriu, 2013) Scientific research is governed by a set of standards and guidelines that can add value and provide direction for navigating the abundance of material found in the literature and other sources. Scientific knowledge is based on questions and answers that facilitate the path towards achieving the goals and objectives stipulated by the researcher at the time the study was launched.

In order to reflect the main objective of the study, namely the bibliometric analysis of the cloud accounting phenomenon, we used specific research tools, namely literature review, analysis, comparison, and synthesis. Among contemporary research methods, bibliometrics is recognised. The study of quantifying scientific research is known as bibliometrics. (Ursachi, 2014) It provides an example of a limited corpus of research evaluating publication physical units, bibliographic citations, and related issues (Broadus, 1987). Thus, bibliometrics is a way to map scientific studies. Keyword co-occurrence, scientific output analysis, reflection of the most cited sources, citation and co-citation analysis, bibliometric linkage, etc. are some of the primary methods employed by bibliometrics to achieve the intended aims.

### ■ Data collection source

To collect the data needed to conduct the bibliometric analysis, we used one of the most popular databases in the scientific community, the Web of Science. The largest and most complete collection of information resources in the world is found on Web of Science. The objective of our project is to collect the database from the Web of Science Core Collection in order to carry out the research. The type of documents selected is articles, the search method is related to the title parameter. The research formula is  $ALL=(Cloud\ accounting)$ , and the selection index is defined by Emerging Sources Citation Index (ESCI), Social Sciences Citation Index (SSCI), Science Citation Index Expanded (SCIE), Book Citation Index – Social Sciences & Humanities (BKCI-SSH), Conference Proceedings Citation Index – Social Science & Humanities (CPCI-SSH), Book Citation Index-Science (BKCI-S). The main domain is business economics, and reference period, 2010-2023. There are 20,552 results provided the search formula executes in its original form without any filters. Upon applying the search parameters, 224 results were found, and these will be incorporated into the bibliometric analysis.



### ■ Research methodology

The design of the study’s structural features, data collection using established selection criteria, data visualisation, analysis, and interpretation of the results are the five basic steps in the research technique that must be followed in order to conduct bibliometric analysis (Zupic & Čater, 2015). There are currently several software packages available for R programming that can be used to examine data related to the scientific database that was chosen for the bibliometric study. To outline the main purpose of the bibliometric investigation we will use the Bibliometrix application, a software package developed based on the R language by Professor Massimo Aria in 2017. It allows statistical data analysis, data pre-processing, co-occurrence matrix construction, co-citation analysis, bibliometric linkage analysis, keyword reflection, document cluster analysis, etc. (Aria & Cuccurullo, 2017).

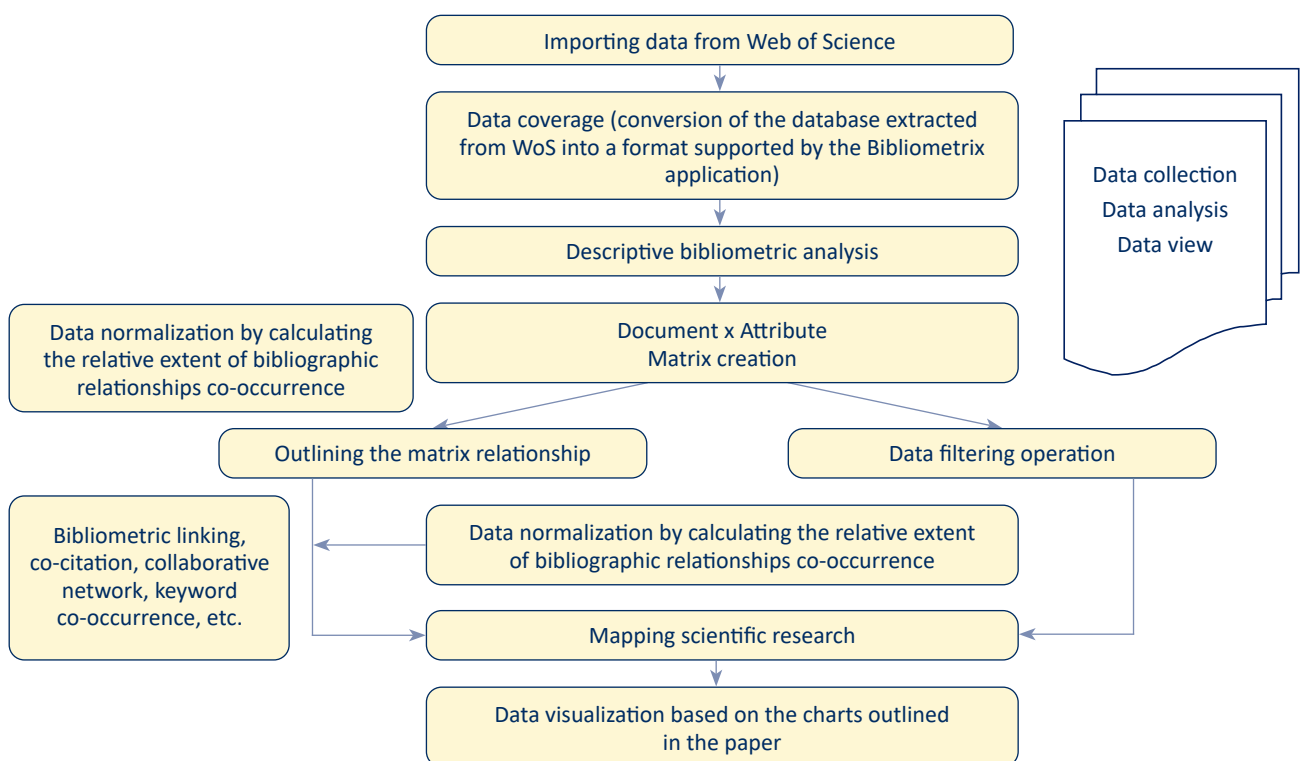


Figure 4. Bibliometrix and recommended workflow in the scientific mapping process

Source: Xie *et al.*, 2020.

As the aforementioned image illustrates, the mapping procedure using bibliometric software is comprehensive and rigorous, comprising of data normalisation procedures, matrix construction based on predetermined correlations, linking, and visualisation. Through an interactive web interface, the Biblioshiny application enables pertinent bibliometric and visual analysis to be performed. In this study, the cloud accounting phenomenon was the topic of a scientific trend analysis and visualisation using Bibliometrix and the Biblioshiny software package.

### ■ Findings analysis

In this section, the findings from the bibliometric performance in the field of cloud accounting and the research universe shaped by the developing cloud computing technology with defining values for the accounting field are to be analysed and interpreted. Phenomenon representativeness in the literature is mirrored by the

significant increase in the investigation interest of the issue, which is justified by the modernity impact in terms of ultramodern information technologies in the area of accounting tasks and functions.

The bibliometric examination of the cloud accounting phenomenon’s peculiarities is captured in the table below.

Table 1. A general overview of data collection

Database	Web of Science Core Collection
Research formula	<i>ALL=(Cloud accounting)</i>
WoS Index	Emerging Sources Citation Index, Social Sciences Citation Index, Science Citation Index Expanded, Book Citation Index – Social Sciences & Humanities, Conference Proceedings Citation Index – Social Science & Humanities, Book Citation Index – Science
WoS research domain	Business economics
Period	2010-2023
Total documents prior to the filters’ application	20,572
Total documents considering filters’ application	224
Materials language	All languages

Source: Own design.

Through the quantitative analysis of the bibliometric approach, the literature published over the last 13 years in relation to the developing field of cloud accounting technology is investigated. Table 2 illustrates several features related to the features of the database being investigated bibliometric and their relationship to the cloud accounting phenomenon.

Table 2. Description of the scientific database on cloud accounting

Description	Results
<b>✓ Main information about data</b>	
Timespan	2010-2023
Sources (journals, books, etc.)	153
Documents	224
Average years from publication	5.07
Average citations per document	9.719
Average citations per year per document	1.447
References	11,079
<b>✓ Document types</b>	
Articles	195
Articles, book chapters	12
Articles; early access	12
Articles; proceedings paper	5
<b>✓ Completed document</b>	
Keywords Plus	565
Author’s keywords	930



Description	Results
<b>✓ Authors</b>	
Authors	567
Author appearances	606
Authors of single-authored documents	31
Authors of multi-authored documents	536
<b>✓ Collaborating authors</b>	
Single-authored documents	32
Documents by author	0.395
Authors per document	2.53
Co-authors per documents	2.71
Collaboration index	2.79

Source: Own design.

In this regard, the above table provides an illustrative note by capturing various aspects such as the study’s reference interval, the number of documents analysed, the average number of citations per document, the types of documents, and concepts pertaining to the materials’ content or author collaborations.

The volume of research published and distributed through various channels is one of the bibliometric indicators used to measure the dynamics of research interest found in both the academic and business worlds. Analysing an annual trend in the scientific production related to the cloud accounting issue demonstrates a consistent rise in the scientific informational weight, which supports the topic’s prominence in the business and research communities.

The graph below illustrates the dynamic growth of the annual scientific output in the field of cloud accounting for the selected reference period, an essential pillar for the in-depth exploration of the phenomenon.

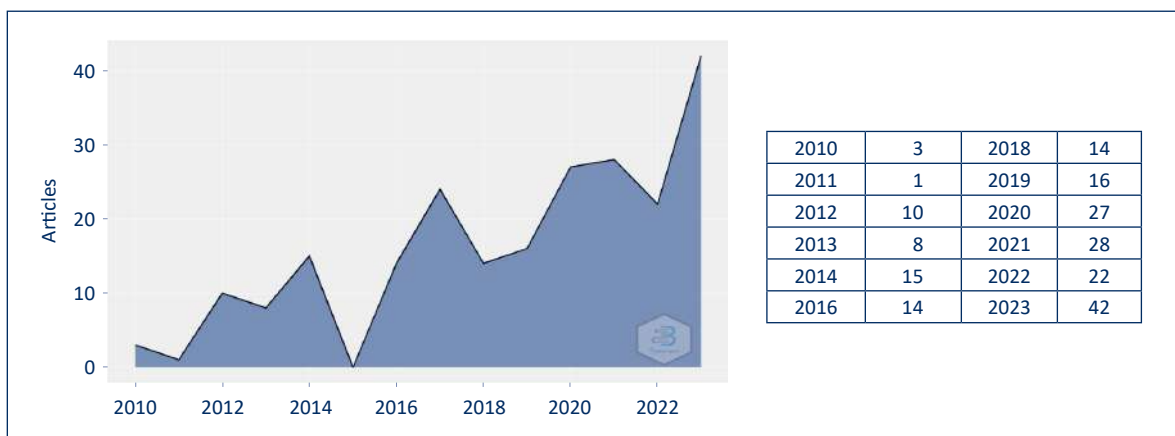


Chart 1. Cloud accounting. Annual scientific output during 2010-2023

Source: Biblioshiny.

The analysis period’s final half-decade demonstrates the dynamic rise in published content on cloud accounting, indicating the phenomenon’s increasing importance for accounting departments within organisations.

Regarding the research findings’ dissemination, the following chart lists the top 20 sources for cloud accounting-related publications ranked by popularity in relation to researchers’ preferred publications.

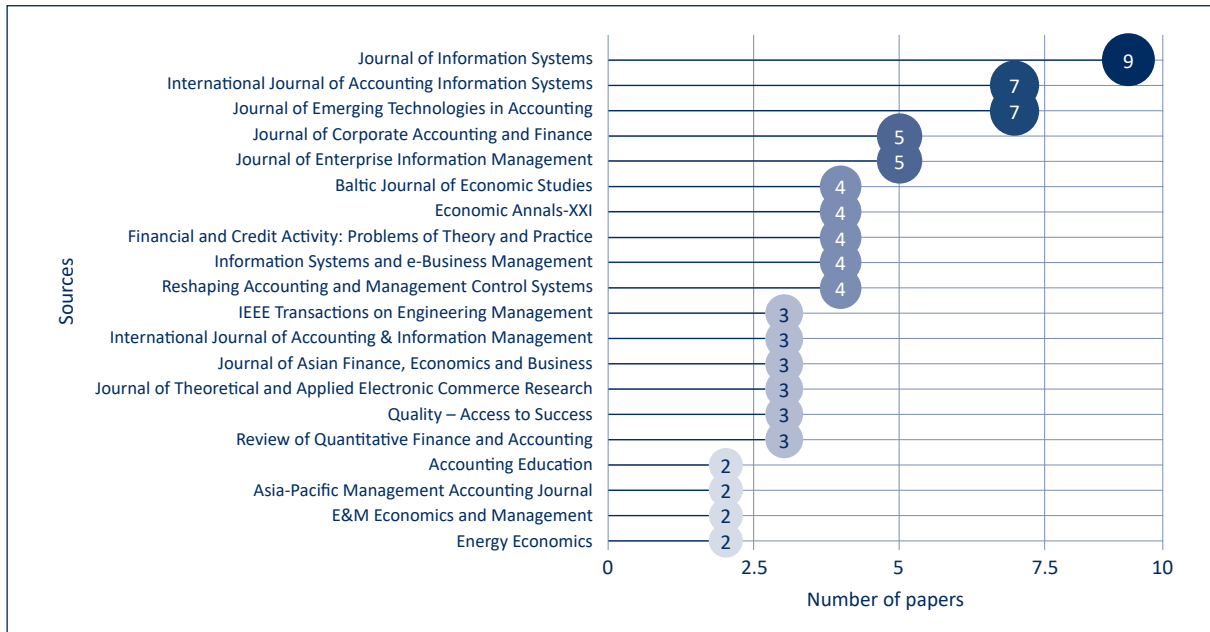


Chart 2. Top 20 most relevant sources on cloud accounting

Source: Biblioshiny.

Consequently, the Journal of Information Systems, International Journal of Accounting Information Systems, Journal of Emerging Technologies in Accounting, Journal of Corporate Accounting and Finance, and Journal of Enterprise Information Management have been highlighted as some of the most widely used publication sources. The journal title suggests that their primary focus is on contemporary information technology in accounting.

Based on the number of articles published, the graph below ranks the most relevant authors for study on the cloud accounting phenomenon: Teuteberg, Rosati, Gangopadhyay, Ionescu, and Lynn.

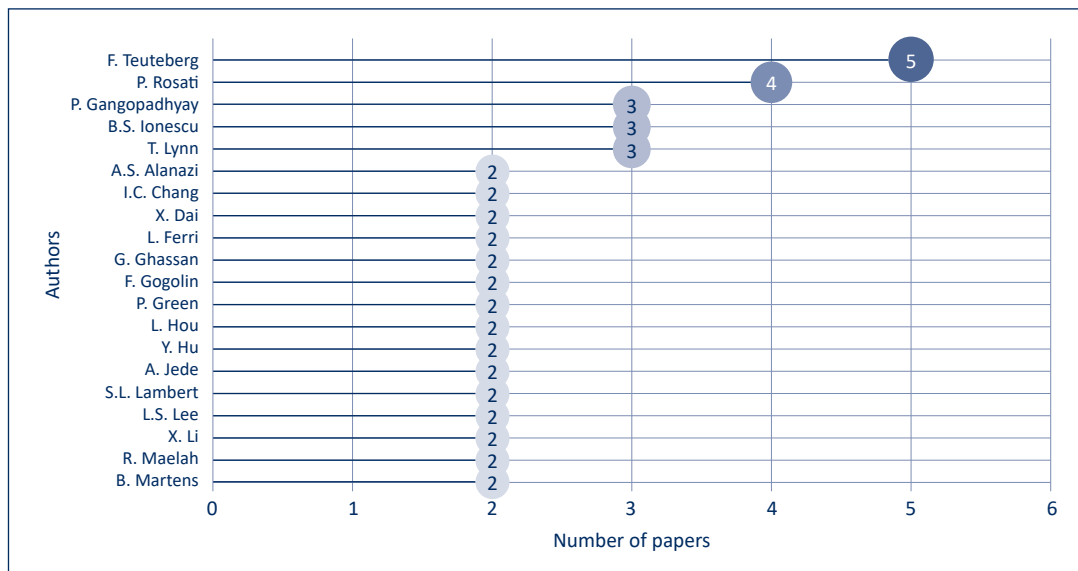


Chart 3. Top 20 most relevant authors on cloud accounting

Source: Biblioshiny.

Based on the authors' sustained interest in the disputed research issue, the graph below shows that Lee has engaged in the most substantial activity, followed by Gangopadhyay and Green, which can be seen in the graph below.

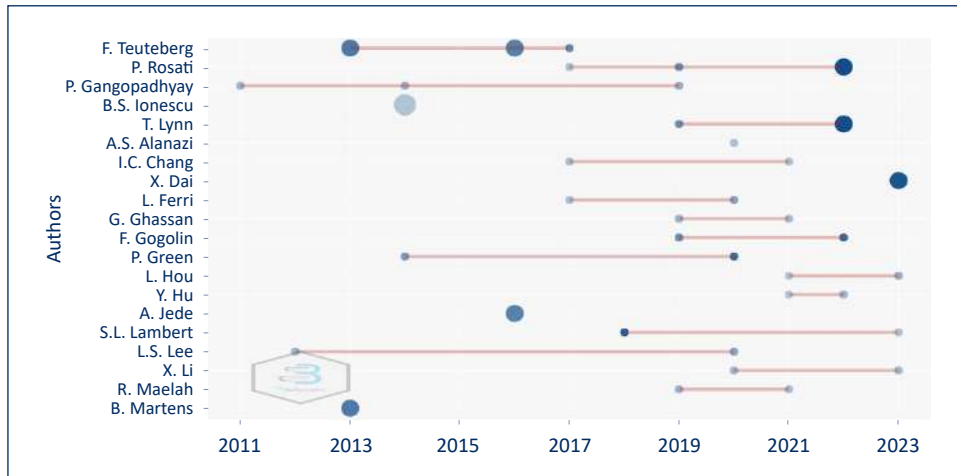


Chart 4. Authors production during 2011-2023

Source: Biblioshiny.

Regarding the authors' affiliation alongside a specific institution, St. Cloud State University, in the United States of America, Dublin City University, Monash University, Bucharest University of Economic Studies, and Mukachevo State University belong among the most remarkable distinctive affiliations in expressing and shaping the research interest in cloud accounting. The above aspects are revealed in the following graph.

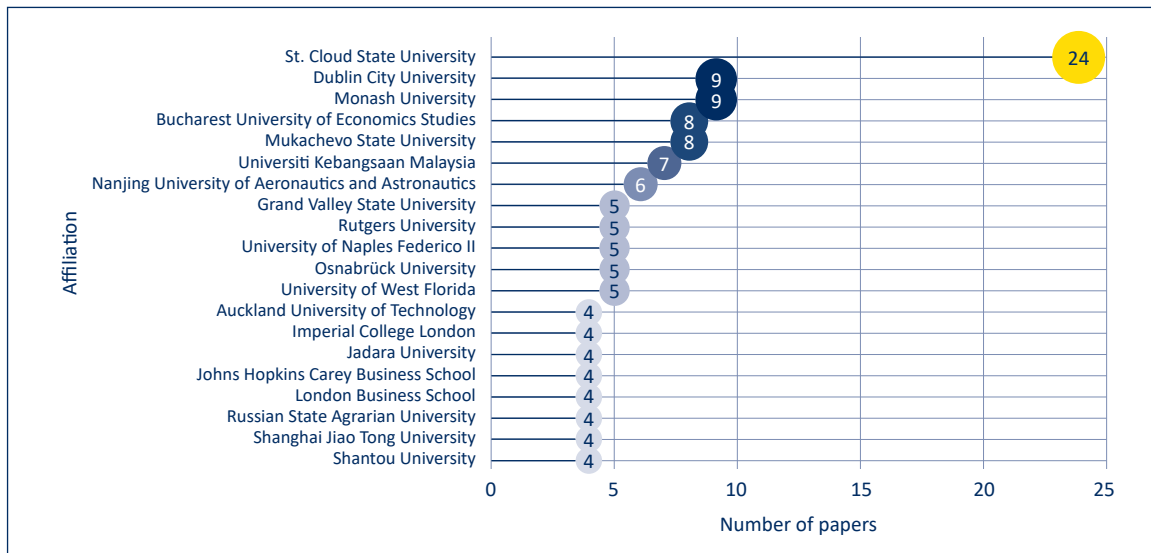


Chart 5. Most relevant affiliations in the research process of cloud accounting technology (authors' affiliation to a specific institution)

Source: Biblioshiny.

To be continued...

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