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Relationships between accounting and intelligence: research paths

ABSTRACT

Objective: to identify the possible gaps and the development of knowledge in research on accounting and intelligence processes.

Method: qualitative and quantitative study. A systematic literature review was carried out, analyzing 89 articles published in scientific journals, collected in July 2020.

Originality/Relevance: accounting is increasingly taking part in decision-making processes and business management. Therefore, accounting science must appropriate strategic intelligence concepts since using information from outside the organization can assist in the more assertive measurement of accounting events and obtaining better information for decision making.


Results: four main categories of research were observed in the articles analyzed. The use of Business Intelligence systems, improvement of accounting provisions, monitoring the environment to identify aspects relevant to the organizations' financial life, and the automation of accounting processes through artificial intelligence and other technologies.


Theoretical/Methodological contributions: this study offers a view on how accounting and intelligence branch out into different research categories. It was possible to identify research gaps and four categories in the development of knowledge on accounting and intelligence processes. Two of them refer to technology and process automation, one focused on managerial aspects of monitoring the environment, and one category is more technical focused on accounting calculation. The study's methodological contribution lies in its form of systematization and illustration of the collection processes.


Keywords: Accounting; Intelligence; Systematic Literature Review.


How to Cite (APA)

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1 INTRODUCTION

Organizations are inserted in a changing and potentially uncertain environment, where information multiplies exponentially both in quantity and diversification. Obtaining data or information has become a basic measure to achieve a competitive differential that depends on new management postures to face constantly updated information sources (Janissek-Muniz & Blanck, 2014).

The importance of information as a driver of managerial decision-making is evidenced in several studies highlighting the need to monitor the organization's external environment. Monitoring aims to improve knowledge of this environment based on the selective interpretation of information and can be referred to as an intelligence process (Choo, 2002; Davenport, 2000; Lesca, 2003; Varum & Melo, 2010). Calof and Wright (2008) argue that intelligence in organizations is derived from a systematic process that involves planning, collecting, analyzing, communicating, and managing. This helps the company sustain distinct competitive advantages, developing actionable insights about its business environment. The intelligence process uses different nomenclatures such as market intelligence, competitive intelligence, strategic intelligence, anticipatory intelligence, artificial intelligence, and business intelligence (Lesca & Janissek-Muniz, 2015; Rios & Janissek-Muniz, 2014).

Although these nomenclatures are different, they all include strategic orientation while encompassing the main definitions for decision making. In this sense, strategic focus can be understood as capturing and interpreting pertinent information, converting it into actions (Xu & Kaye, 2007). According to Pirttimäki (2007), strategic focus supports strategic management, contributing to the information collection, analysis, and distribution. The author argues that the higher the decision-making level, the more consolidated the information must be, and the more conclusions and suggestions must be added, thus generating intelligence.

This scenario influences the approach adopted when exploring large areas of knowledge such as accounting science, which tends to gradually gain space in the decision-making process and in business management rather than being restricted to fulfilling tax obligations (Li, Ning, Li, & Xu, 2017; Zhai & Wang, 2016). Therefore, accounting science should use such intelligence since the information from the external environment can help measure accounting events more assertively, helping managers obtain quality data for decision-making.

There is a close relationship between using intelligence processes with a strategic focus to qualify information and accounting measurement, and further theoretical study is needed to unveil such a relationship. In addition, the strategic focus on information for decision-making and the accounting objective of providing useful accounting-financial information for decision-making also demonstrate a possible relationship between intelligence processes and accounting. Thus, this study offers a systematic literature review to help identify the development of knowledge and point out research gaps in accounting and intelligence processes.

The literature review showed four main research categories: the use of business intelligence systems, improvement of accounting provisions, environmental monitoring to identify aspects relevant to organizations' financial life, and the automation of accounting processes through artificial intelligence and other technologies. The article highlights research paths for future research, pointing out opportunities to complement and expand existing knowledge focused on the use of technology and its impacts, improvement in the measurement of accounting information, and the managerial aspect of environmental monitoring.

This article is organized into six sections, including this introduction. Section two presents the integration of the concepts of accounting information and intelligence. The third section details the method used, followed by a section presenting the analysis of the results. Section five discusses the findings, and section six offers the final considerations.

2 ACCOUNTING INFORMATION AND INTELLIGENCE

Accounting is an applied social science concerned with studying, recording, and controlling assets (Berti, 2001) and is a source of relevant information for decision-making (Atkinson *et al.*, 2000). Thus, understanding accounting information is essential to obtaining optimal results (Horngren, Sundem, and Stratton, 2006; Moreira *et al.*, 2013).

Accounting information is a relevant asset to guide decision-making and a useful tool for the various stakeholders (Li *et al.*, 2017; Zhan & Wang, 2016). Accounting is no longer seen as an activity limited to meeting legal requirements. It is gaining ground in the management area as an important tool for better resource allocation. This issue becomes evident with the automation of accounting processes based on information systems that help provide useful, relevant, and timely data for management and financial decision-making (Neely & Cook, 2011).

There is a tendency in academic literature to emphasize the importance of accounting information beyond the organization, so studies highlight its relevance and impact with market users and not only internal users (Valente & Fujino, 2016). Another relevant focus is improving the measurement of results – which can be considered the indicator that summarizes financial statements (Barth & Shipper, 2008). Technology is inserted in accounting to improve the measurement of economic phenomena and thus produce more credible information in financial reports (Barth, 2014). In light of the growing significance of accounting information for business management, this research questions the use of intelligence practices to improve accounting management, considering that organizations increasingly need quality data and information to deal with environmental uncertainties and improve decision-making processes (Rezende, 2012; Vidigal, 2013; Lesca & Janissek-Muniz, 2015).

Intelligence refers to activities that help organizations monitor and understand the business environment. Furthermore, it seeks to coordinate the monitoring activities of specific elements of the organizational environment, systematically developing information toward decision-making (Gilad, 1989). Additionally, it seeks to find the meaning of data and information that, before in-depth and relational analysis, appeared to be irrelevant, disconnected, or just ‘environmental noise’ (Lesca, 2003; Schoemaker & Day, 2009). The context may change after analysis and critical judgment informed by environmental monitoring. This phenomenon offers the opportunity for the company to adapt its strategy to market changes, create a competitive advantage, and feed its decision-making process more assertively, based on sensitive and useful data (Janissek-Muniz & Blanck, 2014).

The concept of intelligence has several terms used in the development of scientific work in business strategy, namely: competitive intelligence, entrepreneurial intelligence, strategic intelligence, anticipatory intelligence, business intelligence, market intelligence, and organizational intelligence (Rios & Janissek-Muniz, 2014). Other terms are equally noteworthy in this study area, such as environmental scanning, competitive intelligence system, strategic scanning, forecast, scenario planning, corporate foresight, and strategic foresight. The strategic direction appears as the main competitive differential, involving different orientations (Lesca & Janissek-Muniz, 2015). However, regardless of the term used, all definitions emphasize the importance of monitoring the environment to obtain useful information to help managers with decision-making. In this study, in a complementary way, such nomenclatures will be treated as synonyms since they all defend monitoring the external environment aiming at the organizational perception, capture, analysis, interpretation, and action.

The ability to identify pertinent information from the environment and anticipate changes that are still emerging is a determining factor in business competitiveness and sustainability and to organizational success (Varum & Melo, 2010). It is possible to obtain

benefits through intelligence processes in organizations by reducing uncertainties and promoting strategies that culminate in organizational performance, competitive advantage, and business innovation (Adegbile, Sarpong, & Meissner, 2017).

Changes in the organizational context based on changes in the business system mean that companies constantly have to adapt to disruption and new paradigms (of products, concepts, technologies), being open to accepting the dynamism caused by evolutions of all kinds in the organization's ecosystem.

Regardless of the area of operation, technological evolution witnessed in the last decades, with the use of information and communication technologies (ICT), is helping the intelligence processes in organizations and facilitating business transformation. Accounting studies evidence the benefit of adopting such technologies by the growing attention of the area in using big data, business intelligence, and artificial intelligence systems (Rikhardsson & Yigibasioglu, 2018; Sutton, Holt, & Arnold, 2016).

3 METHOD

This is a qualitative and quantitative study describing the causes of a phenomenon through mathematical and textual language (Marconi & Lakatos, 2003). Mathematical language was initially used to obtain a quantitative overview of the studies published on accounting and intelligence, and textual language was used to broaden the understanding of the approaches these studies adopted.

The research describes the characteristics of a sample using standardized data collection techniques. As for technical procedures, it is a literature review based on published articles that support the assumptions explored throughout the development of the issues of accounting and intelligence (Marconi & Lakatos, 2003).

The analysis considered a sample with 89 articles published in scientific journals, collected in July 2020 from the databases a) AIS (Association for Information Systems) – which includes the eight main journals in the area of research in information systems; b) Scopus; and c) Web of Science. These databases were selected due to their relevance to the scientific area of applied social sciences, specifically accounting. For the search, all possible combinations were considered between two accounting words (accounting and controller) and eight main words for intelligence (intelligence; corporate foresight; weak signal; environmental scanning; future studies; strategic foresight; forecast; and scenario planning).

The parameter used in 16 searches made in each database was the combination of words related to accounting and intelligence, including terms commonly used in research in both areas in the articles' titles. Quotation marks were added to the terms so that the resulting search contained the exact words. The articles were saved with the respective abstract in PDF files for further information processing, seeking to make this a transparent, explicit, and reproducible process (Muños, 2009). Figure 1 details the procedures used to analyze the 89 articles.

As shown in Figure 1, the primary search performed in the databases returned 389 articles, which were mapped with the aid of an electronic spreadsheet and, after a thorough analysis of the abstracts, 285 studies were excluded, as they were not aligned with the research theme. Most of these exclusions happened with the texts identified from the search using the word "controller." This occurred because the word can mean accountant as a manager who supports the decisions of a company, or the accounting controllership area, or even control in its broadest sense. Thus, most publications that contained this word in the title used a broader notion of control. Many articles were from fields of study such as engineering and were generally aimed at finding better control measures for artificial intelligence techniques (for example, the article "The Design of Artificial Intelligence Robot Based on Fuzzy Logic

Controller Algorithm, ” appeared in the results since they contained the search words, but it is not related to the scope of this study).

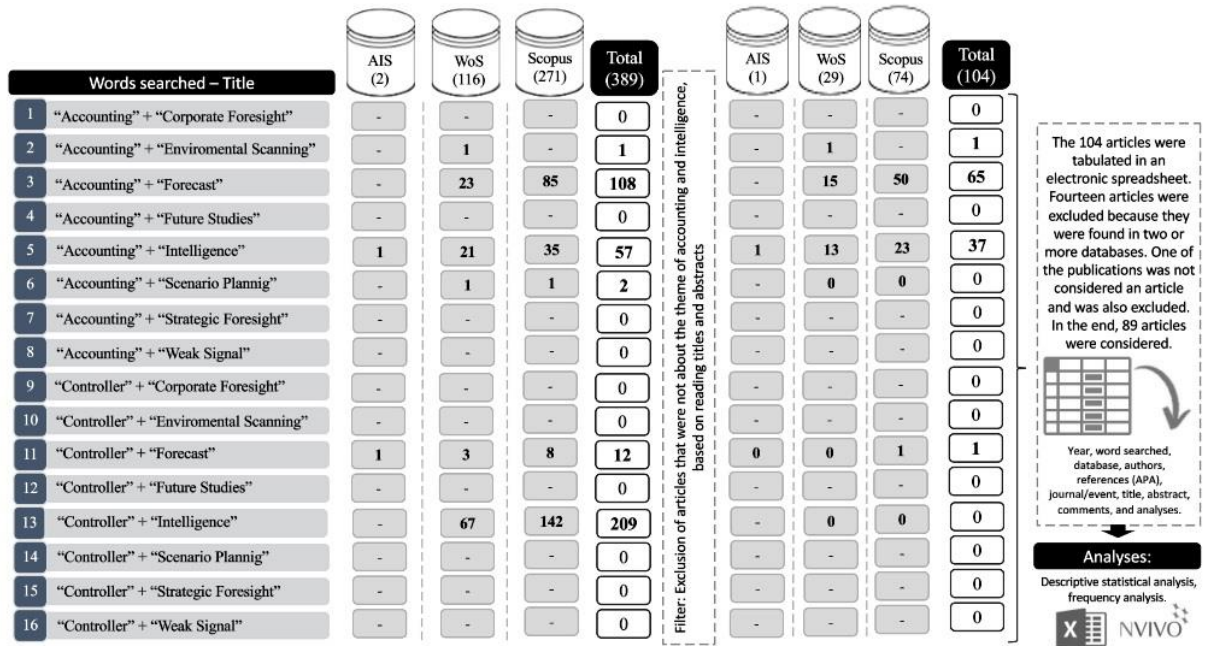


Figure 1 – Procedures of data collection, treatment, and analysis

Of the remaining 104 articles, 14 were repeated in the different databases and were thus excluded. Consequently, 90 articles had their data tabulated in an electronic spreadsheet that contained the following columns: Year, word searched, database, authors, references, journal/event, title, abstract, comments, and analyses. The final verification identified that one of the texts was not characterized as an article and was excluded from the sample, resulting in 89 documents.

Data analysis took place in two parts. First, using bibliometric procedures inspired by Lotka’s Law (Lotka, 1926) or the Inverse Square Law, which states that a small number of researchers produce most of the articles in an area of knowledge. Second, the methods inspired by Bradford’s law of scattering (Rousseau & Rousseau, 2000) supports the assertion that a small group of scientific journals addresses a certain subject in greater depth, intending to estimate the degree of relevance of scientific journals operating in areas of knowledge. Thus, we sought to analyze the authorship structure of articles related to accounting and intelligence, identify the number of articles published in academic journals over the years, and the journals with the highest concentration of publications on this topic, considering the quantitative part of the method.

The second form of data analysis, characterizing the qualitative part of the study, was content verification (Bardin, 2011), using categorization through frequency counting and interpreting the meaning of the words used in the search when associated in sets. NVivo® software, version 12, was used to operationalize the frequency counting and association of grouped words. We chose to present an initial overview of research approaches within the subject of intelligence and accounting and possible study opportunities in this area. The data tabulated in the spreadsheet was used for these analyses, mainly focusing on the articles’ abstracts. Given the search for a broad mapping, it was decided not to use the articles’ full text (most of them were not available in full).

4 RESULTS

All the analyzed articles were written in English and 39 (43.82%) were published in the 2010s. It is noteworthy that, although there are more publications on this topic in the last three decades (1990, 2000, and 2010), it is possible to identify the insertion of this research topic in the 50s, 70s, and 80s. The increase in the number of published studies is correlated to technological evolution and its possibilities of relating intelligence and accounting, as already highlighted by Barth (2014). Figure 2 shows the number of articles published per decade, highlighting a deepening of this analysis in the 2000s and 2010s.

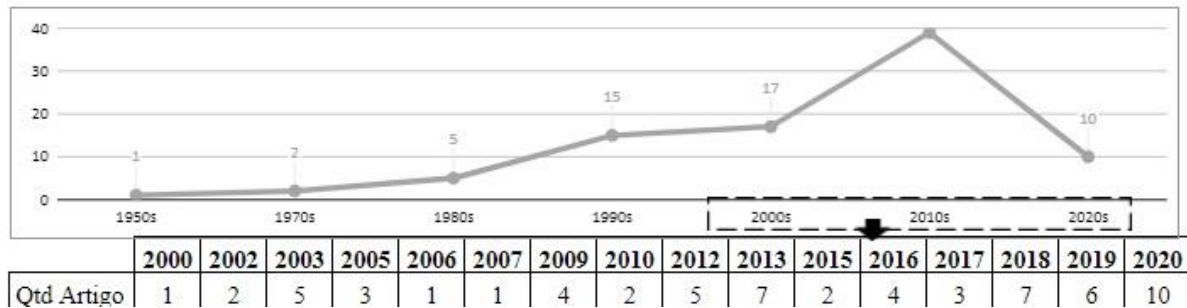


Figure 2 – Number of articles published in each period

The average of annual publications on accounting and intelligence between 2000 and 2019 was 2.8 articles per year. This number may seem small, but it occurs because some years recorded no publications, for example, 2001 and 2008. The years that had the highest number of publications were 2013 and 2018, both with seven articles, and 2020 with ten articles, at the moment of collection.

Regarding the researchers of the 89 articles, twenty-four authors had two publications on the subject. The concentration of production per researcher is still small, going against Lotka’s law (Lotka, 1926). This may be related to the breadth of the theme that allows for several research sub-themes. Also, the growing number of publications after the 1990s suggests that the field of study is still not consolidated.

The articles identified were published in a large number of different journals. While journals with more than two articles studying the theme published 30 articles in total, 59 journals published just one article each. Figure 3 shows the list of journals with more than one article published on the subject, the quantity, and the years of publication.

Journal	Number of articles	Year of the publications
Abacus	2	1985; 2016
Asian Journal of Business and Accounting	2	2019; 2020
European Accounting Review	2	1995; 2013
Expert Systems with Applications	2	1992 (2)
IEE Access	2	2020 (2)
International Journal of Accounting Information Systems	2	2016; 2018
Journal of Accounting and Economics	2	2013; 2018
Journal of Accounting and Public Policy	2	2002; 2009
Journal of accounting research	2	2003 (2)
Journal of Accounting, Auditing & Finance	5	1995; 2017; 2018; 2019; 2020
Journal of Business Finance & Accounting	3	1976; 1998 (2)
Journal of Intelligent and Fuzzy Systems	2	2019; 2020
Review of Accounting Studies	2	2005; 2016
Other journals that published one article	59	

Figure 3 – Journals that published more than one article

Figure 3 shows that publications on the subject of intelligence and accounting are not yet concentrated in a group of scientific journals that address this issue in-depth – going against Braford’s law of scattering (Rousseau & Rousseau, 2000). In this sense, the journal with the highest number of publications in the period analyzed was the Journal of Accounting, Auditing & Finance (5 articles), four of which were published in the last four years (2017, 2018, 2019, and 2020). This reinforces that this is a research field still under consolidation. Therefore, we decided to conduct a content verification based on the articles’ abstracts to identify the categories of research and highlight possible research opportunities in this area (Kocsis, 2019). Figure 4 summarizes the categories identified from the content analysis.

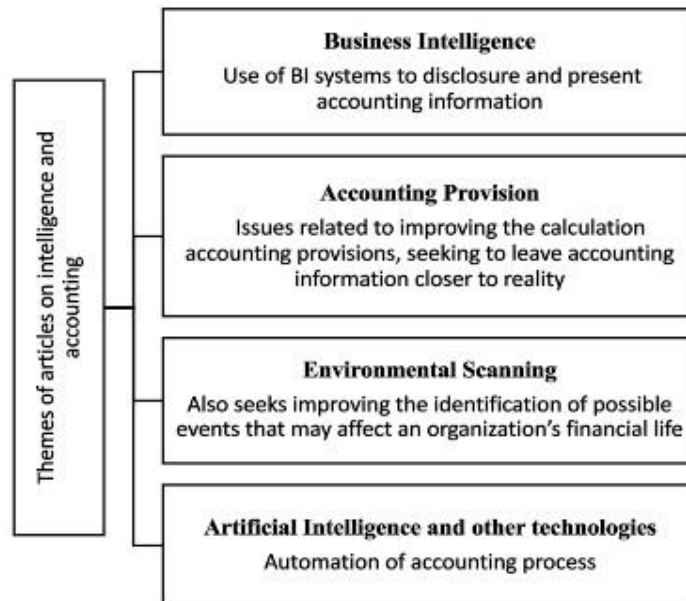


Figure 4 – Categories of research on intelligence and accounting

The next section discusses the results considering the four categories described in Figure 4, highlighting the approaches adopted.

5 DISCUSSION

5.1 Business Intelligence

Technological evolution has brought countless opportunities to analyze and use data and information from the external environment to help transform businesses from the qualification of managerial decision-making in accounting (Nespeca & Chiucchi, 2018; Rikhardsson & Yigitbasioglu, 2018; Sutton, Hold, & Arnold, 2016). For Ionescu (2012), technological advancement is a facilitator in a world of unpredictability, where organizations must make immediate decisions and take action. For the author, creating the specific term “accounting intelligence” (AccI) to be used daily in accounting information contributes to improving time management and the issuance of periodic reports.

Grytz and Krohn-Grimberghe (2018) recognize the importance and growth of using systems of business intelligence and analytics in accounting as data drives organizational decision-making. However, the authors point out the need to analyze the costs involved in applying such systems since adoption is usually slow. For Nespeca and Chiurcchi (2018), the use of business intelligence and analytics to support decision-making is widespread and relevant to management accounting. Their research showed that the implementation of business

intelligence could affect management accounting through incremental changes in existing techniques and relevant changes when using new and more advanced techniques. In the research by Kalantari, Mehrmanesh, and Saeedi (2012), optimization techniques, notification, and simulation, models in accounting were highlighted as the main benefits arising from the use of business intelligence systems.

Therefore, the articles in this category emphasize the use of business intelligence systems to disclose and present accounting information. This highlights the tendency in accounting to focus on disclosing information to a greater diversity of stakeholders rather than solely to the organization's internal audience.

This analysis suggests that identifying the stakeholders in accounting areas and the information that should be monitored in the environment to help plan and develop the accounting activity based on intelligence processes in organizations is a research opportunity to consider.

5.2 Accounting Provision

This category was the most representative in the sample, gathering 50 out of the 89 articles. These articles were grouped per decade according to the year of publication in order to visualize the evolution of the topics studied in the category.

In the 80s and 90s, several approaches to accounting provisions were identified, some of which are discussed below. Initially, the results obtained by Barnea and Lakonishok (1980) stand out. The authors concluded that the use of disaggregated data is not directly related to better predictions of corporate performance than aggregated data. In addition to this topic that lists the type of data used in forecasting, it is possible to observe studies on project evaluation methods and their equivalence (Madan, 1985). The impact of new accounting standards at that time, as well as the Financial Accounting Standards Board's rules for accounting, foreign currency reporting, and the Statement of Financial Accounting Standards, are issues studied frequently in these two decades in attempts to identify their effects on financial analysts' forecasts (Castanias & Griffin, 1986; Chen, Comiskey, & Mulford, 1990).

Research from the 2000s also discusses the adoption of new accounting standards and their effects on financial analysts' forecasts. In this sense, Acker, Horton, and Tonks (2002) show that in the first year of the standard (FRS3), some confusion related to its definitions led to an increase in analysts' errors in that year. However, the adoption of the standard in the following years contributed to the accuracy of the analysts' forecasts. Along the same lines, the study by Hope (2003a) concluded that disclosures of accounting policies and annual reports are very useful for analysts. The findings obtained by Hope (2003a) and Pope (2003) indicated that the disclosure of accounting policies reduces the uncertainty about expected earnings. In addition, a financial approach put forward by Olson and Mossman (2003) observed that the use of neural network techniques to classify companies that should have high or low returns allows for greater profitability when applying various trading rules in the financial market. In addition to what has already been highlighted, some studies focus on the accuracy of financial analysts' earnings forecasts and the degree of compliance with accounting standards (Dorsman, Langendijk, & Praag, 2003; Hope, 2003b), as well as the use of these forecasts as a parsimonious proxy for accounting information (Cheng, 2005).

Finally, articles published in the 2010s presented studies linking accounting conservatism and financial analysts' earnings forecasts (D'Augusta, 2018; Pae & Thornton, 2010; Sohn, 2012; Sun & Xu, 2012). Other topics addressed in the 2010s were the issue of earnings management when analyzing "grouped" forecasts or managerial earnings forecasts issued simultaneously with earnings announcements (Rogers & Van Buskirk, 2013); a theoretical and empirical study of the relationship between value relevance and the month of

market value sampling (Marek-Klimczak & Szafranski, 2013); analyses of the impact of the current financial reporting environment with the increasing use of accounting estimates and their ethical and financial impacts (Ayres, Huang, & Myring, 2017; Bradshaw, Christensen, & Gee; Whipple, 2018; Glaum, Baetge, Grothe, & Oberdörster, 2013; Kim, 2016; Misleading, 2016; Smieliauskas, Bewley, Gronewold, & Menzefricke, 2016); studies on the analysis of financial analysts and their impacts (Choi, Lee, Park, & Yoo, 2015; Newman, Gamble, Chin, & Murray, 2013; Wahab, Teitel, & Morzuch, 2017); investigation of the concept and purpose of forensic accounting (Aleksic, Vujnovic-Gligoric, & Uremovic, 2015); and verification of the predictive capacity of the main insolvency models developed in Brazil (Andrade & Lopes Lucena, 2018). In addition to these themes, articles that are somehow linked to the theme of accounting or accounting information quality of XBRL (Liu & O'Farrell, 2013) and whether accounting quality affects US security analysts' target price forecast performance stand out (Cho, 2013).

All studies are aligned with the accounting objective of reporting on an organization's assets in the most credible way possible. In this measurement of assets, sometimes the provision of uncertain gains or losses for institutions is needed, leading accountants to adopt specific measurement and disclosure standards. In addition, it is necessary to consider the financial provisions related to the organizations' possible profits, those made by analysts to advise investors.

Therefore, it is noteworthy that the main objectives of publications on accounting provision are aligned with a better measurement of provisions, whether for the organization's financial reports or to optimize financial analysts' forecasts.

5.3 Environmental Monitoring

The search for information from the monitoring of the external environment can come from the need to fill gaps in decision-makers' knowledge, which hinder evolution and lead to uncertainties, requiring better information checking in the environment (Davenport, 2000). There are numerous sources of information in the organizational sphere, and different realities require executives to collect data from formal or informal sources, inside or outside the organization (Andriotti & Freitas, 2008).

Sabau, Sgardea, Budacia, and Paunescu (2009) emphasize the importance of accounting information in sustaining the effectiveness of the competitive intelligence system, listing accounting information as a multilateral and vital theme for competitiveness and organizational performance. For the authors, accounting professionals need to extend their activities beyond the traditional limits of internal accounting instrumentation of economic transactions, seeking to contribute to the organization's strategy. According to Garvin and Garvin (1996), specialized environmental monitoring systems can help in the efficiency of the organizations' accounting departments.

Although the information on values and costs is of general interest, this issue is particularly relevant for the accounting sector (Patrascu, Ratiu, Paraschivescu, & Radu, 2010). Patrascu *et al.* (2010) argue that this sector is responsible for offering valuable information to facilitate the managers' decision-making. The first studies identified in this review referred to the category of environmental monitoring, whereas the more recent studies have increasingly discussed the use of technological mechanisms in different areas of knowledge, including accounting.

5.4 Artificial intelligence and other technologies

Regarding the theme related to the use of artificial intelligence, big data, machine learning, artificial intelligence, and blockchain, the results of the studies by Rikhardsson and Yigitbasioglu (2018) and Zhang, Xiong, Xie, Fan, and Gun (2020) are highlighted. These studies point out that, although there was a certain lull in the late 1990s, research on artificial intelligence in accounting continued to increase progressively over the last 30 years, with a great impact of these technologies on the training and practice of accountants.

Further consideration of artificial intelligence techniques as modules embedded in integrated audit support systems similarly suggests the frequent use in practice (Rikhardsson & Yigitbasioglu, 2018). Thus, as Sutton, Holt, and Arnold (2016) highlighted, research on artificial intelligence systems is crucial, aiming at expanding the notion of artificial intelligence.

Articles published in the 1990s adopted the following approaches: academic studies aimed at training students (Baldwin-Morgan, 1995), the description of multidisciplinary programs on intelligence in accounting (Behrens & Steibart, 1992), the use of artificial intelligence to reduce costs and increase process quality (Chase & Shim, 1991), mitigate bookkeeping problems (O’Leary, 1991), and increase accounting expertise (Meservy, Denna, & Hansen, 1992). From the 2000s onward, the review detected only articles with an approach related to cost and process optimization to contribute specifically to improving decision-making (Dull & Earp, 2000), improving time management and accounting reports (Ionescu, 2012), reducing costs, and improving information processing (Ye, 2017).

Finally, studies related to artificial intelligence and other technologies in recent years have focused on the automation of accounting processes to gain productivity, efficiency, better customer service, better informational quality, and cost reduction (Ionescu, 2019; Lee & Tajudeen, 2020).

The increase in studies related to the automation of accounting processes suggests the need for research on the training and behavior of accounting professionals, addressing the paradigm shifts and ways of working with new technologies.

Table 1 offers the main research opportunities that emerged from the analysis conducted in this study, which may contribute to the development of the field:

Table 1

Research opportunities per category of studies on intelligence and accounting

Categories of studies on intelligence and accounting	Research opportunities
Business intelligence	Identifying the stakeholders in accounting areas and the information that should be monitored in the environment to better plan and develop the accounting activities based on intelligence processes in organizations
Accounting provision	Measure the impact of the intelligence process in qualifying accounting provisions
Environmental monitoring	Mapping best practices and the gains arising from the effective and constant mapping of the accounting area’s internal and external environment
Artificial intelligence and other technologies	Seeking to understand the cultural relationship that involves resistance in adopting new technologies to the detriment of traditional internal accounting; issues related to the training and behavior of accounting professionals when adopting technologies focused on data intelligence; research on the potential benefits of applying artificial intelligence in accounting

The opportunities that emerged from this systematic review summarized in Table 1 are separated according to the categories identified in research on intelligence and accounting. They are based on the analysis of the articles identified and highlight the need for further studies in the following topics related to the categories business intelligence and artificial intelligence and other technologies: i) the relationship of the accounting professionals and technology, focusing on identifying how technology contributes to improve their work and guide their routine to produce information that impacts decision making; the resistance of professionals regarding the adoption of new technologies to automate the accounting activities; ii) information for decision making, focusing on identifying relevant information in different business areas and how technology contributes to offer quality information for decision making. Finally, the research opportunities identified in the categories accounting provision and environment monitoring were related to measuring the impact of intelligence and mapping best practices in accounting so that adopting intelligence processes in accounting becomes an ordinary and systematic practice.

6 FINAL CONSIDERATIONS

This study offers a theoretical and empirical basis to develop a conceptual and practical approximation of intelligence processes in the field of accounting. The findings suggest that organizations should build in their accounting area the capacity for environmental monitoring and using data and information to improve decision-making. Thus, the focus of accounting should shift from being limited to fulfill fiscal and tax obligations to encompassing intelligence and information to feed the organization's decision-making processes.

Information technology can support organizations in this process, such as in the case of using business intelligence and analytics in accounting activities. Rikhardsson and Yigibasioglu (2018) point out clear links between these fields and defend the benefits to accounting. However, the literature in leading journals on accounting and information systems has shown little interest in this connection. This also happened in other related topics such as artificial intelligence (Sutton, Holt, & Arnold, 2016), which gained prominence only in more recent studies (Zhang *et al.*, 2020; Ionescu, 2019; Kumar, Doshi, Balasingam, & Arumugam, 2020).

Studies in the category of environmental monitoring were the first registered in this review, related to the use of data and information from the environment to optimize accounting data for decision-making. This finding represents an opportunity for further studies seeking to explore the use of current environmental monitoring practices in the context of accounting practices. The preponderance of studies in the category accounting provision (50 articles) demonstrated the academy's persistent concern over the years, reinforcing the importance of improving accounting provisions measurement to qualify the organizations' financial reports and financial analysts' forecasts.

The close relationship between intelligence processes to qualify information and accounting measurement was evident regardless of the category of analysis. Also clear was the importance these studies gained in the field considering the increase in publications in recent years. The word clouds in each category (Figure 5) reveals connections among them, pointing out the importance of concepts related to information, anticipation, analysis, and results strongly linked to the concept and practices of intelligence and the preponderance of the word accounting in these studies.

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*Relações entre contabilidade e inteligência: caminhos de pesquisa***RESUMO**

Objetivo: identificar de que forma se apresenta o desenvolvimento do conhecimento e quais as possíveis lacunas deste em pesquisas que envolvem a Contabilidade e os processos de Inteligência.


Método: estudo de natureza qualitativa e quantitativa. Realizou-se uma Revisão sistemática de literatura em que foram analisados 89 artigos publicados em periódicos científicos, coletados em julho de 2020.

Originalidade/Relevância: A contabilidade está cada vez mais inserida no processo de tomada de decisão e na gestão dos negócios de forma a ser relevante a apropriação de conceitos de Inteligência Estratégica junto à ciência da contabilidade, uma vez que a utilização das informações advindas do ambiente externo pode auxiliar na mensuração de forma mais assertiva dos fatos contábeis e na obtenção de melhores informações para a tomada de decisão.

Resultados: observa-se quatro principais enfoques de pesquisa nesse contexto: a utilização de sistema de Business Intelligence; o melhoramento de provisões contábeis; o monitoramento do ambiente para identificação de aspectos relevantes à vida financeira das organizações; e a automatização dos processos contábeis por meio de Artificial Intelligence e demais tecnologias.

Contribuições teóricas/metodológicas: O estudo traz como contribuição uma visualização sobre como os temas de contabilidade e inteligência se ramificam em enfoques diferentes de pesquisas. Portanto, foi possível identificar quatro enfoques no desenvolvimento do conhecimento e lacunas de pesquisas que envolvem a Contabilidade e os processos de Inteligência. Dois enfoques de pesquisa estão mais voltados ao uso de tecnologia e automatização de processos, um enfoque voltado ao aspecto mais gerencial de monitoramento de ambiente e um aspecto mais técnico voltado a apuração contábil. Como contribuição metodológica tem-se a forma de sistematização e ilustração dos processos de coleta.


Palavras-chave: Contabilidade; Inteligência; Revisão Sistemática de Literatura.

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