


DISRUPTIVE INNOVATIONS: ARTIFICIAL INTELLIGENCE, BLOCKCHAIN, IINTERNET OF THINGS, AND BIG DATA IN THE TRANSFORMATION OF ENTERPRISE FINANCE <https://doi.org/10.56238/sevened2024.037-066>**Telma Regina Stroparo¹ and Beatriz Bochniak²****ABSTRACT**

The research aims to analyze the applicability of the main disruptive technologies, with an emphasis on Artificial Intelligence (AI), Blockchain, Internet of Things (IoT) and Big Data, in the accounting and financial transformation of companies, highlighting their impacts on process automation, optimization of strategic decision-making and improvement of the efficiency and transparency of financial operations. Methodologically, this is a qualitative research and uses an integrative literature review to investigate how intense technological innovations are being implemented and what impacts they generate on business practices, notably accounting. The analysis focuses on the benefits, challenges, and opportunities provided by artificial intelligence, exploring its role in automating accounting and financial processes, improving the accuracy of analysis, and optimizing decision-making. In addition, the relevance of artificial intelligence in optimizing decision-making is discussed. The study also addresses the ethical implications and cultural adaptation needs that come with implementing these technologies. The results denote improved accuracy and minimization of errors in accounting processes due to the ability to identify inconsistencies and inconsistencies, highlighting the transformative potential that AIs present in the accounting and financial field, notably due to the automation of processes, the improvement of accuracy.

Keywords: Disruptive Technologies. Artificial intelligence. Digital Transformation. Innovations.

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INTRODUCTION

Disruptive Technology refers to that whose insertion in the market is capable of changing or breaking paradigms established within companies or industries, whether in their internal operations, or in their mode of production or in the delivery of their final product (Schuelke-Leech, 2018; Gawanmeh; Al-Karaki, 2021). The accelerated advancement of these technologies has significantly transformed several sectors of the economy, including the accounting and financial areas. Innovative tools are being rapidly implemented, and topics such as Artificial Intelligence (AI), Blockchain, Robotic Process Automation (RPA), Machine Learning, and Big Data dominate business discussions, especially with regard to the applicability, information security, and cost-effectiveness of these technologies (Gawanmeh; Al-Karaki, 2021; Hopster, 2021; Stroparo *et al.*, 2024, Stroparo, 2021)

In the extensive literature available, it can be seen that these disruptive technologies are being applied in several areas, with special emphasis on corporate finance. AI-based tools have been widely adopted to automate processes, improve the accuracy of analyses, and optimize decision-making in companies (Ajayi-Nifise *et al.*, 2024; Arrieta *et al.*, 2020; Bahoo *et al.*, 2024; Nath *et al.*, 2024; Sharbek, 2024). Specifically in the accounting and financial area, the impact is not limited to the automation of routine tasks; such technologies also promote new levels of predictive analysis, risk management, and transparency in financial operations (Pordeus; Stroparo, 2021; Branches; Stroparo; Cordeiro, 2021)

The use of Blockchain Accounting (BCA) is another crucial example of how accounting has been transformed. Blockchain technology offers a layer of security and immutability of accounting records, allowing for continuous and automatic audits, eliminating the need for intermediaries and ensuring greater transparency in financial records. In addition, smart contracts running on the blockchain automate processes such as paying suppliers and settling contracts, reducing delays and operational costs (Stroparo, 2024).

The impact of Internet of Things Accounting (IOTA) is also significant, with IoT sensors integrated into accounting systems, allowing for real-time inventory control and physical asset management. The combination of IoT with Big Data Accounting (BDA) makes it possible to collect and analyze large volumes of data, improving the accuracy of financial projections and allowing for a more agile response to market variations and operational demands (Hopster, 2021).

The revolution caused by these disruptive technologies is so intense that international bodies such as the International Financial Reporting Standards (IFRS) and the United Nations (UN) play crucial roles in creating guidelines and standards that harmonize the adoption of these technologies with the principles of corporate governance and social



responsibility. The International Accounting Standards Board (IASB), which is responsible for overseeing IFRS, recognizes the need to adapt accounting standards to reflect these transformations. This includes analyzing the use of algorithms in accounting decision-making and the impact of automation on the preparation and presentation of financial statements.

Furthermore, Artificial Intelligence (AI), as a fundamental disruptive technology, remains a driving force in advancing process automation, from the simplest tasks to strategic decision-making. AI is capable of analyzing large volumes of data, identifying financial patterns, and anticipating market trends, making it an essential tool for optimizing accounting and financial processes (Black; Samson; Ellis, 2024; Carolan, 2024; Stroparo, 2024; Stroparo et al., 2024; Stroparo *et al.*, 2024b)

In this context, the research aims to analyze the applicability of disruptive technologies, focusing on tools such as AI, Blockchain, IoT and Big Data, in the accounting and financial transformation of companies. By exploring the impact of these innovations on automation, operational efficiency, and improved transparency, the study aims to provide a comprehensive overview of the future of business finance and the role of these technologies in optimizing processes and decision-making.

METHODOLOGY

The present research is characterized as qualitative and uses an integrative literature review to analyze findings in similar research. Therefore, it seeks to identify and synthesize published studies and analyze

the applicability of disruptive technologies, with an emphasis on AI tools, Blockchain Accounting (BCA), Internet of Things Accounting (IOTA) and Big Data Accounting (BDA) in the accounting and financial transformation of companies.

To ensure the scope and relevance of the studies, searches for scientific articles were carried out in the Web of Science, Scopus and ScienceDirect databases, using the following descriptors: "Artificial Intelligence in Accounting", "Disruptive Technologies in Finance", "Financial Transformation", "Automation in Corporate Finance", "AI in Business Decision-Making", "Blockchain Accounting", "IoT in Accounting" and "Big Data Accounting". These descriptors were chosen in order to ensure that the studies found address in a broad and deep way the impact of disruptive technologies on accounting.

The inclusion criteria adopted were: articles published in peer-reviewed journals; studies that discuss the application of AI in accounting and corporate finance; publications in English or Portuguese; and recent and/or classic studies with a significant number of



academic citations, ensuring the timeliness and relevance of the data. Texts related to the automation of financial processes, the improvement of accounting efficiency, and the optimization of strategic decision-making through AI were also included. In this bias, articles that did not directly address the accounting or financial transformation of companies, duplicate publications, and studies with insufficient methodology or inconclusive data were excluded from the portfolio.

Official documents and guidelines issued by professional bodies and government initiatives for the regulation and regulation of AI's are part of the discussions and, in a special way, we are interested in statements made by the International Financial Reporting Standards (IFRS), the body responsible for the International Accounting Standards used to standardize and harmonize the preparation and presentation of financial statements of companies around the world and the United Nations that issued the first global standards to govern artificial intelligence in the organization's 193 member countries.

RESULTS AND DISCUSSIONS

In a scenario where organizations face an environment of high competitiveness and rapid technological changes, it is crucial that they adjust their interactions with the environment in a coordinated and integrated way. This strategic alignment is essential for them to fulfill their missions and ensure their future sustainability

According to Armstrong (2019), disruptive technology generates a lot of conflict and contestation among critics regarding the applicability of this term, as many believe that it must follow certain criteria. This technology has two main attributes which are speed and completeness that can be clearly seen in the new technologies that are emerging, where technology quickly updates or replaces old processes (Zeng *et al.*, 2023)

Among the disruptive technologies described in the academic literature are Artificial Intelligence (AI), *Blockchain*, robotic process automation (RPA), machine learning, and *big data*.

AI is a comprehensive set of technologies that promise several advantages for organizations in terms of added value to the business (Hariri *et al.*, 2019). Characterized as a disruptive force for companies around the world, AI appears to be underutilized in a wide range of sectors. (Gawanmeh; Al-Karaki, 2021; Hopster, 2021, 2024; Stroparo *et al.*, 2024)

Economically, AI is considered one of the most influential innovations of humanity, as it significantly impacts the financial market, particularly the technological sector. Projections indicate that the expected revenue over the next decade will increase to 2.74 billion dollars and the estimated global size of the Artificial Intelligence market stood at US\$ 129.28 billion



in 2022 and is expected to exceed US\$ 2.7 trillion by 2032 (Bonaparte, 2024; Stroparo *et al.*, 2024)

Research conducted by (Wassie; Lakatos, 2024) discusses how AI can support the company's internal audit (IAF) by providing substantial strategic oversight, minimizing manual procedures, and enabling additional value-added audit services. However, it shows concern about research gaps in the literature, such as limited studies on the topic, low adoption rates of AI in the IAF in different countries and regions, and a dearth of comprehensive frameworks for the effective use of AI in the IAF, as well as related to data ethics and security.

Study by (Zayed *et al.*, 2024) examined the role of artificial intelligence (data collection, automation, accurate reporting, improved efficiency, and predictive analytics) in accounting information systems in fraud detection and prevention. It used a quantitative approach in a sample of 187 financial and accounting managers in the hotel industry in Jordan. The results of the study conclude that artificial intelligence can be positively influential in detecting fraud.

Dealing specifically with the related ethical issues, such as transparency of algorithms, the potential for bias, data integrity and security, and privacy have been discussed frequently and in a warning tone. In addition, several international bodies are making official studies related to regulation on the role of accounting professionals as guardians of ethics (Bankins; Formosa, 2023; Eke; Stahl, 2024; Hinings; Gegenhuber; Greenwood, 2018)

In addition, among the applications of disruptive technologies and AI, the automation of routine accounting tasks, such as bank reconciliation, preliminary audits, cash flow analysis, and tax calculation, stands out. The available tools help in the processing of large volumes of data quickly and accurately (Ajayi-Nifise *et al.*, 2024; Hasan, 2021; Novelli; Taddeo; Floridi, 2023; Stroparo *et al.*, 2024). It was also found in the literature that the use of AI tools provides improved accuracy and minimizes errors in accounting processes due to the ability to identify inconsistencies and inconsistencies (Hasan, 2021). AI can also generate more detailed and personalized reports, meeting specific requirements, which, in theory, results in greater transparency in financial statements.

AI, applied in accounting and finance, is one of the most transformative technologies, as it has the ability to automate routine processes, such as account reconciliation, transaction verification, and financial reporting (Chen; Read; Li, 2020; Stroparo *et al.*, 2024). Examples of AI application in the business area can be cited: a) Predictive Analysis, which consists of anticipating financial trends, predicting cash flows, and identifying financial risks



using historical data patterns; b) Natural Language Processing (NLP), which aims to automate the reading and interpretation of accounting documents considered complex, such as contracts and financial statements; c) Audits aimed at detecting errors and/or financial fraud.

AI, therefore, represents a milestone in technological development, providing systems with the ability to emulate aspects of human cognition. This simulation transcends the execution of predetermined commands, allowing machines to make independent choices by analyzing trends in vast amounts of data (Barbosa; Portes, 2023). (Al-Okaily, 2024; Ballantine; Boyce; Stoner, 2024)

With regard to financial processes, companies need to carry out transactions, which include accounts payable and receivable, sales forecasting, monitoring, and expense reporting. With the implementation of smart technology, accountants have access to more accurate and detailed information to perform predictive and prescriptive financial analysis for their clients. This can make financial processes more efficient, accurate, and profitable. Predictive and prescriptive analytics are two comprehensive outcomes of the application of AI in accounting (Santos, 2023).

Within the accounting sphere, especially in management, it is crucial to consider the frequent transformations and increasing automation and technological integration. AI is one particular example that is reshaping the industry. As a result, accounting is evolving, absorbing new ideas and roles, while advanced technologies are replacing manual tasks (Stroparo *et al.*, 2024a)

Like other cutting-edge, high-risk technologies, including biotechnology, metaverse virtual realities, and nanotechnology, AI shares essential characteristics: it is a disruptive innovation; it appears relatively quickly; maintains consistency over time; it has a significant impact on society and the economy; and provokes a mixture of fear and indecision (Del Castillo, 2024).

On the other hand, blockchain technology, can be characterized as a decentralized digital ledger that securely records and verifies transactions on a distributed network, and is often described as the backbone of modern digital currency systems (Degirmenci; Recker, 2023)

Predictions from the World Economic Forum (2015) assert that since blockchain technology was first described in 2008, the banking, financial, insurance, education, healthcare, and government sectors have used it to the point that 10% of global GDP will be recorded and stored on blockchain by 2027 (Han *et al.*, 2023)



According to the *Institute of Chartered Accountants in England and Wales (ICAEW)* - in Portuguese, Blockchain is not a single technology, but rather a protocol — a way of doing things — to record transactions. Unlike the Internet, in which data is shared, on a blockchain ownership can be transferred from one party to another. Blockchain is a desirable model for several reasons. For example, in a market with many parties transacting, it could remove the need to reconcile disparate ledgers. Being distributed among all users also eliminates disruptions and removes the cost of having to pay a central authority to maintain ledger accuracy. Any participant in the ledger can track all past transactions, allowing for greater transparency and blockchain for self-auditing (ICAEW, 2018) (Han *et al.*, 2023)

Currently, it is possible to find studies relating blockchain technology in fields that require high performance, security, transparency, and cost efficiency, notably related to the Bitcoin cryptocurrency (Alamsyah; Syahrir, 2024; Bonsón; Bednárová, 2019; Han *et al.*, 2023; Lee *et al.*, 2019; Weerawarna; Miah; Shao, 2023). However, the use for accounting purposes has been notably expanded by the financial sector.

The research entitled "Accounting and Auditing with Blockchain Technology and Artificial Intelligence: A Literature Review" discusses how blockchain is transforming accounting and enterprise finance, detailing the transparency, immutability, and efficiency of accounting and auditing practices (Han *et al.*, 2023).

In this bias, BCA can also be mentioned, which is the use of blockchain technology to record, verify, and validate financial transactions on a distributed and immutable ledger. Such characteristics make BCA one of the main disruptive technologies that redefine accounting and financial practices because it eliminates intermediaries, reduces fraud, and improves the integrity of financial data (Bonsón; Bednárová, 2019)

Regarding the BCA tool, the results point to an improvement in transparency, immutability and efficiency in accounting and auditing practices. Continuous Auditing and Automation, for example, are cited as examples of areas that benefit from Blockchain because it allows real-time analysis (Han *et al.*, 2023)

Another important point is risk mitigation and greater transparency regarding financial analysis. This fact is justified by the fact that blockchain offers traceability and immutability of records, which can reduce fraud (Alamsyah; Syahrir, 2024; Bonsón; Bednárová, 2019; Gadekallu *et al.*, 2022; Han *et al.*, 2023). Therefore, BCA can make a significant impact by providing transparency, real-time tracking, and security for accounting practices. An example might be the use of BCA to automate audit processes, eliminating intermediaries and facilitating ongoing audits. One can discuss case studies of companies that already use BCA to improve the accuracy and security of their financial records.



Another technology that can be cited in this research is Internet of Things Accounting (IOTA) which refers to the use of the Internet of Things (IoT) to collect real-time data related to operational and financial processes. IoT sensors can generate financial data from assets, inventories, and operations in real time, integrating it into the accounting system

As for IOTA, it is verified that the use of IoT sensors in accounting can be expanded to **physical asset management** and **inventory control**, where data can be recorded and controlled in real time and directly [integrated with accounting systems, reducing human errors and improving financial control. Cost management can also benefit from IOTA tools to optimize operating spend, based on resource usage data. Therefore, IOTA adds a layer of automation and real-time monitoring to accounting, allowing operational data to be transformed directly into financial information without the need for intermediaries. This is highly disruptive and offers companies greater cost control, asset management, and financial predictability

On the other hand, concepts related to Big Data refer to the ability to analyze large volumes of structured and unstructured data in real time, and its use is common by the accounting and financial sectors. Applying to accounting, it is common to find "**Big Data Accounting (BDA)**" which is the use of big data for advanced analysis of financial data, combining large volumes of internal and external data to improve accounting and financial decision-making.

BDA, therefore, refers to large volumes of complex data that cannot be managed or processed with traditional data analysis tools and are usually analyzed under the scope of the 5V': a) Volume: The massive amount of data generated by various sources, such as financial transactions, social networks, IoT sensors, among others; b) Speed: Data being processed and analyzed in real time; c) Variety: It is related to the diversity of data, which can be structured (such as database tables) and unstructured (such as images, videos or texts); d) Veracity: The reliability of the information generated needs precision and accuracy and; e) Value: The usefulness and potential of data can generate competitive advantages for companies.

Chart 1 lists some examples of technology from each of the disruptive technologies discussed in this article:



TABLE 1 Technologies applicable to Corporate Finance

DISRUPTIVE TECHNOLOGY	APPLICATION	DESCRIPTION
Artificial Intelligence (AI)	QuickBooks	Automates accounting tasks, expense categorization, and cash flow analysis.
Artificial Intelligence (AI)	Xero	Simplifies accounting by automating bank reconciliations and cash flow forecasting
Artificial Intelligence (AI)	IBM Watson	Used in various industries for predictive analytics and financial risk analysis.
Blockchain Accounting (BCA)	VeChain	It offers product tracking solutions and real-time monitoring in supply chains.
Blockchain Accounting (BCA)	Chainalysis	Transaction analysis tool for regulatory compliance and fraud prevention.
Blockchain Accounting (BCA)	Ethereum Smart Contracts	Automates financial transactions and trade contracts, reducing the need for intermediaries.
Internet of Things Accounting (IOTA)	Zebra Technologies	Inventory management and asset monitoring with IoT sensors.
Internet of Things Accounting (IOTA)	Honeywell Asset Management	Monitors equipment performance in real time, assisting in predictive maintenance.
Internet of Things Accounting (IOTA)	Microsoft Azure IoT Central	Real-time asset monitoring and management platform, with integration with business systems.
Big Data Accounting (BDA)	Tableau	Visualization tool that transforms large volumes of data into visual insights.
Big Data Accounting (BDA)	Google BigQuery	A service for the rapid analysis of large volumes of data, used to understand consumption patterns.
Big Data Accounting (BDA)	Hadoop	Big Data processing and storage platform for complex analytics.

Source: The authors, (2024)

Chart 1 presents a selection of applications characterized as disruptive technologies and applicable to the context of accounting and corporate finance, highlighting AI, BCA, IOTA and BDA tools. Each technology category is represented by exemplary applications that reveal its transformative potential in different accounting processes.

In the area of AI, applications such as QuickBooks and Xero stand out, which aim to automate basic accounting processes, including expense categorization and bank reconciliations. On the other hand, the IBM Watson application further extends the application of AI by offering advanced predictive analytics capabilities, which demonstrates its potential in risk management and generating strategic financial insights.

For BCA, tools such as VeChain and Chainalysis that use blockchain for tracking and regulatory compliance have been identified. The decentralized and immutable nature of blockchain strengthens the integrity of financial records and simplifies ongoing audits, eliminating intermediaries and reducing fraud. Ethereum Smart Contracts, meanwhile, shows how BCA can automate financial transactions, making trade contracts more secure and reducing reliance on manual processes.



In the IOTA category, the application of IoT sensors, as in Zebra Technologies and Honeywell Asset Management, to manage assets and monitor inventories in real time is observed, allowing for more effective management of operational resources and providing precise cost control. In turn, Microsoft Azure IoT Central exemplifies how real-time data integration into accounting systems enables a comprehensive and up-to-date view of financial operations, increasing predictability and cost control.

Finally, bringing examples of BDA applied to the analysis of large volumes of data, there are tools such as Tableau and Google BigQuery that have the potential to transform vast data sets into visual and predictive statements. Hadoop, on the other hand, is an example of Big Data storage and processing for companies that need to manage and process varied data quickly and reliably, allowing complex analyses that directly contribute to more informed financial management.

Therefore, it is not just about automation, but about the incorporation of new technologies capable of transforming the financial structure of companies themselves, allowing unprecedented levels of precision, accuracy, security, and intelligence in accounting processes.

FINAL CONSIDERATIONS

The research aimed to analyze the applicability of the main disruptive technologies, with an emphasis on AI, BCA, IOTA and BDA, in the accounting and financial transformation of companies, highlighting their impacts on process automation, optimization of strategic decision-making and improvement of the efficiency and transparency of financial operations and the results point out that disruptive innovations — especially AI, IoT and Big Data — are redefining accounting and financial practices in companies in a profound and irreversible way.

Such technologies not only automate routine processes, but have the power to bring new possibilities for predictive analysis, risk management, and optimization of strategic decision-making.

The adoption of AI in the business context has proven to be a useful tool by transforming manual processes such as account reconciliation, audits, and financial reporting into automated activities, with greater accuracy and efficiency. Also noteworthy is AI's ability to identify patterns and inconsistencies in large volumes of data provides predictive analysis that strengthens financial management, increasing the agility of decisions and minimizing errors.



On the other hand, BCA, when implemented, enables significant improvements in terms of transparency, security, and efficiency in accounting practices, especially in audits and transaction verification. The fact that data is immutable on the blockchain allows for greater trust in financial records, reducing the need for intermediaries and promoting continuous and automated audits, while reducing fraud.

As for IOTA, the results point out that by adding a layer of real-time automation, improving the ability to monitor assets and inventories in real time allows for the optimization of costs and resources.

The BDA tool allows the analysis of large volumes of data, internal and external, streamlining strategic decision-making processes and forecasting financial trends, and this is due to the high capacity for processing and analyzing data from various sources in time.

However, one cannot abstain from ethical challenges such as algorithmic transparency, data privacy, and bias prevention, which, in fact, can be translated as critical areas that require continuous attention from governance policies and internal and external regulatory frameworks.

In short, disruptive innovations are not only transforming the way businesses conduct their finances but also shaping the future of accounting and financial practices in a more efficient, transparent, and secure way.



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