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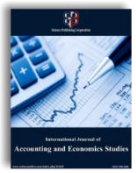

Big Data Analytics in Financial Accounting: Opportunities And Challenges

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Abstract

Large volumes of unstructured data collected from many sources and kept in multiple formats make up big data in accounting and finance. It is often measured in terabytes and zettabytes and arrives so quickly that a standard server cannot handle it. Big data in accounting and data science, which provides real-time access to the data, enables accountants to identify issues so that businesses may make decisions based on verified facts and evidence rather than speculation. As a result, understanding big data analytics in accounting has become crucial for professionals in the finance and accounting fields. The Journal of Big Data and Accounting Data Science is are important resource for understanding the area of data science and analytics.BDA adoption is still in its early stages, with many healthcare institutions considering implementing BDA systems. In order to improve healthcare facilities by keeping patient health records and developing better plans, now is the best moment to adopt or install BDA systems, particularly in healthcare companies. This study contributes to the literature by emphasizing the essential components needed to establish the BDA system. Because they identify early elements that strategy makers should take into account while implementing a BDA system, the study's findings are especially important.

Keywords: *Financial Accounting; Big Data Analytics; Opportunities, Challenges; Real Time; Data Science.*

1. Introduction

Today, an overwhelming amount of data is generated by our daily activities and gadgets. Companies produce tremendous amounts of transaction data along with social media and smartphones, which enable individuals to contribute to the data deluge(May 2013). Embedded sensors used in smart devices to communicate with each other also generate data. The present age is referred to as the "Information Age," but extracting required and relevant information is becoming a task analogous to finding a needle in a haystack. Fortunately, the same technology that has become an integral part of our daily life also provides us with tools and techniques to search for the needle. Each area in business and society will benefit from the value generated from Big Data. It helps in improving the quality of life in a variety of ways. Big Data is classified into three main types, viz., Structured, Unstructured, and Semi-structured. Big Data Analysis is a pipeline of different stages of processing Big Data to extract relevant and important information. Data Acquisition: Data Acquisition is the first and foremost stage of any data analysis process. Data generation and collection have become cheap and fast due to the rapid increase of devices like sensors, computers, and mobile phones (Shivakumar, 2013; Al-Mamoori et al., 2022). Every person who has an account on social media like Facebook, Twitter, or Instagram becomes a data generator and contributes to the growth of data every second. A tremendous amount of data generated puts us into a dilemma as to what is to be retained or discarded. This data is collected and stored as the first step in the process of knowledge extraction(Radhakrishnan et al., 2024). A prosperous society requires financial accountability, which is a prerequisite for financial accounting.Numerous instances exist where research-backed enhancements to financial accounting have improved financial accountability (Schroeder et al., 2022). Strong ties between accounting scholars and practitioners are necessary for this kind of research, and these ties have fluctuated over Abacus's existence. The multi-source, high-dimensional, and rapidly updated characteristics of data in the financial accounting domain make quality control and data management more challenging in the context of big data(Gandomkar et al., 2022). Strict data standards that address both the accuracy of data collection and the consistency and integrity of data throughout the

transmission process must be created in order to improve data quality(Amiri&Akkasi, 2015; Okuonghae, 2019).In order to improve data transparency and traceability, businesses should adopt accounting information systems that are tailored to the big data environment, such as implementing cloud computing-based platforms for data sharing and storage, and leveraging blockchain technology to increase data immutability (Voshaar et al., 2025; Rahimi&Mansouri, 2018).

1.1 Objectives

- Recognize how financial accounting procedures can be changed by big data analytics.
- Investigate the different kinds of big data technologies and tools that are applied in financial accounting.
- Determine the main financial accounting domains that profit from big data analytics, such as auditing, financial reporting, and fraud detection.

1.2 Research Question

- How big data is changing traditional financial accounting functions and methods.
- What are the key challenges faced by financial accounting professionals in implementing big data analytics?

2. Literature Review

The disclosures refer to the periodic release of information about the organization to influence the decision of the investor and shareholders. The financial information disclosure consists of both positive and negative data and operational details that are going to impact the business of the organization. Disclosure of Financial information is a process by which the accounting measurements are communicated to the external stakeholders of the organization, such as financial institutions, banks, and external investors, to have a better understanding of the organization while making investment decisions. It is also generated to present all financial statements and tiny information about the financial transactions to the internal shareholders of the organization for decision-making (Wang et al., 2022). The financial disclosure should contain all relevant information about the company's financial transactions, generally accepted accounting principles, or optional management choices, accounting adjustments, accounting errors, asset requirements, insurance contract modifications, and noteworthy events related to financial transactions. Financial disclosure is primarily used to prevent, detect, investigate, or prosecute corruption. It is also primarily used to encourage responsibility among public officials to prevent conflicts of interest and to improve the institution's reputation. Accounting policy is a standard used for manipulating the earnings legally. Accounting policies and standards are defined and recommended by the Institute of Chartered Accountants of India [ICAI]. These policies become applicable to organizations only when the central government acknowledges them. The accounting policies are predominantly used for preparing the financial statements of the company. The financial accounting information should be relevant, reliable, comparable, and consistent. The accounting policy is configured with methods, measurement systems and procedures, and processes for presenting the financial information in the form of statements (He et al., 2022). It is important to document the accounting policies and standards to create an internal control framework, and useful for ensuring accountability and consistency in daily transactions for financial reporting. The accounting policies are developed on fundamental principles, namely, Revenue Recognition principles. The principles of cost, matching, complete disclosure, and objectivity(Jothisri&Rajkumar, 2016). The accounting policies are built upon the accounting concepts of business entity, money measurement, going concern, accounting period, cost, concept of duality aspect, realization, accrual, homogeneity, integrated data orientation, impartiality, and matching. To fulfill a task within the accounting department, accounting policies are set up with certain procedures. Accounting processes include billing clients, paying supplier invoices, calculating employee salaries, and more. Financial functions do not produce non-financial regulatory reports (Cao, 2022).

3. Methodology

In this study, we apply two well-known summarizing approaches, sampling and clustering, to summarize the sensor data. The main rationale for selecting these methods is that they should efficiently condense data for later usage without requiring additional memory or time. The performance of summary data is evaluated through multiclass classification on a benchmark dataset using three different classifier types: KNN, SVM, and Naïve Bayes. This is achieved by classifying the test dataset after the multiclass classifiers have been trained on the summary data (King et al., 2021). The classification accuracy is contrasted with the classification accuracy attained during training using the full data.

Research design: A strategy to be applied in connection with a particular research project is indicated by research design. The steps in the research design process include choosing the research problem, presenting it, developing hypotheses, ensuring conceptual clarity, methodology, gathering data, testing hypotheses, interpreting the findings, and presenting the findings.

Data collection: Interviews: Conduct semi-structured interviews with financial professionals, accountants, auditors, and managers who use big data analytics in their organizations. This will offer comprehensive insights into the best practices, obstacles. Examples of Cases: Choose a few businesses whose financial accounting procedures have effectively incorporated big data analytics. Examine these case studies to understand best practices, real-world challenges, and solutions.

Sampling

This clearly shows that the purpose of sampling is to choose representatives for the total population, which is the exact concept behind data summarization. The challenging aspect here is choosing the right representatives. The two primary categories of sampling procedures are probabilistic and non-probabilistic. When employing probabilistic sampling procedures, each member of the population has an equal chance of being chosen as the sample. Probabilistic sampling techniques include stratified sampling, systematic sampling, and simple random sampling. We employ the stratified sampling technique in our study, which is applicable in situations when the population is divided into discrete categories (Saleh et al., 2022). Because the dataset is multiclass, the stratifying technique is appropriate when we perform extra classification. The population is divided into numerous "strata," or non-overlapping groupings, using stratified sampling. In subsequent sampling, every stratum is considered as a population. Because the sample considers every subgroup, this results in a statistical analysis that is efficient. For this stratified data, we use both systematic and random sampling. We even consider the "proportionate stratification" technique, which increases the effectiveness of the sample by ensuring that the samples collected are proportionate to the size of

each stratum. Stratified sampling has the drawback of identifying discrete strata; however, this is mitigated by the intrinsic quality of our dataset, which is made up of three classes. Different sample sizes are used to sample the data, and the sample mean is used to select the representative sample. The classification training data set is created using this representative sample, and its efficacy is assessed. The distribution of Big Data Usage across Different Industries is shown in Fig. 1.

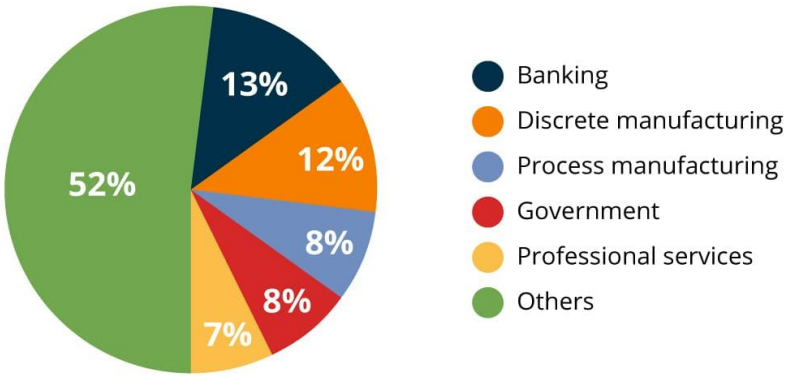

Fig. 1: Distribution of Big Data Usage across Different Industries

4. Challenges of Big Data Analytics

DifficultiesBecause there is still a lot of research to be done in this field, reading literature presents several obstacles in the field of big data analytics. Some of the challenges observed are: To devise suitable preprocessing techniques as data is from varied sources. To develop suitable models to integrate and represent data. Mining techniques explored so far are limited and new techniques must be evolved to address different characteristics of Big Data like velocity, variety and veracity (Bellucciet al., 2022). Online Feature extraction and analysis of streaming data on a large scale remains an open problem. Domain specific approaches to mine and analyzing Big Data must be explored to extract insights which are relevant when combined with domain knowledge. Privacy preserving data mining in terms of crowdsourcing that is gaining importance must be considered. Appropriate visualization methods must be used to represent the analysis so that it can be comprehended easily. Effective summarization methods are also the need of the hour as it eliminates the difficulty of retaining the entire data.In the upcoming years, the jobs of accountants will be impacted by big data and commercial analysis, which also gives accountants the chance to advance to strategic and productive positions in corporate organizations.Many of the tasks performed by accountants today, including creating traditional reports, are being replaced by technology.In the future, a proficient accountant will serve as a crucial liaison between top management and data analysts.Apart from his customary obligation to ensure the precision and caliber of financial data, the true guardian of privacy and the moral use of big data is also capable of handling and evaluating data.Conceptual Framework Diagram Illustrating the Role of Big Data in Financial and Managerial Processes shown in Fig. 2.

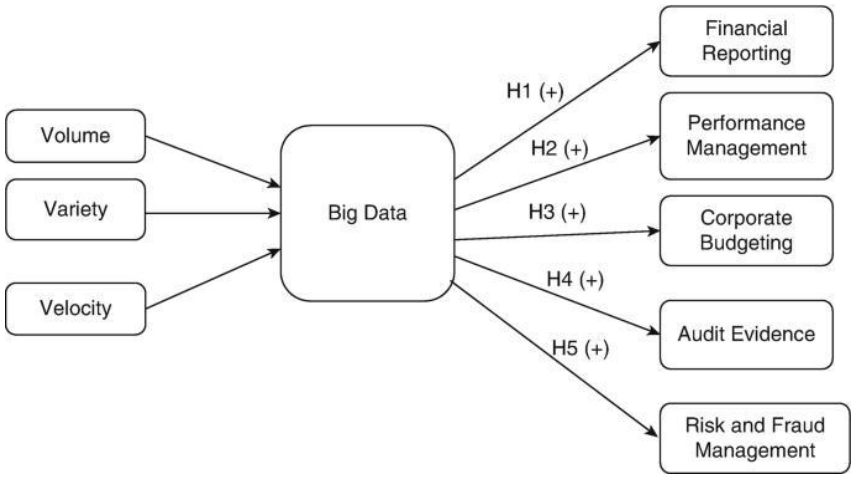

Fig. 2: Conceptual Framework Diagram Illustrating the Role of Big Data in Financial and Managerial Processes

According to the researcher, candidates with technical and statistical skills to handle and analyze large amounts of data will undoubtedly be paid more in commercial organizations for the new positions of accountants and financial analysts. Therefore, in order to improve the quality of accounting information and provide value to corporate organizations, accountants must understand the significance of big data and improve their skills in interpreting and analyzing it. The "Information Technology Skills and Knowledge for Accounting Graduates" International Accounting Accreditation (IAA) NO 7 mandates that accounting programs incorporate educational opportunities that foster the development of knowledge and abilities linked to the incorporation of information technology in business and accounting.Reliability Analysis shown in Fig. 3.

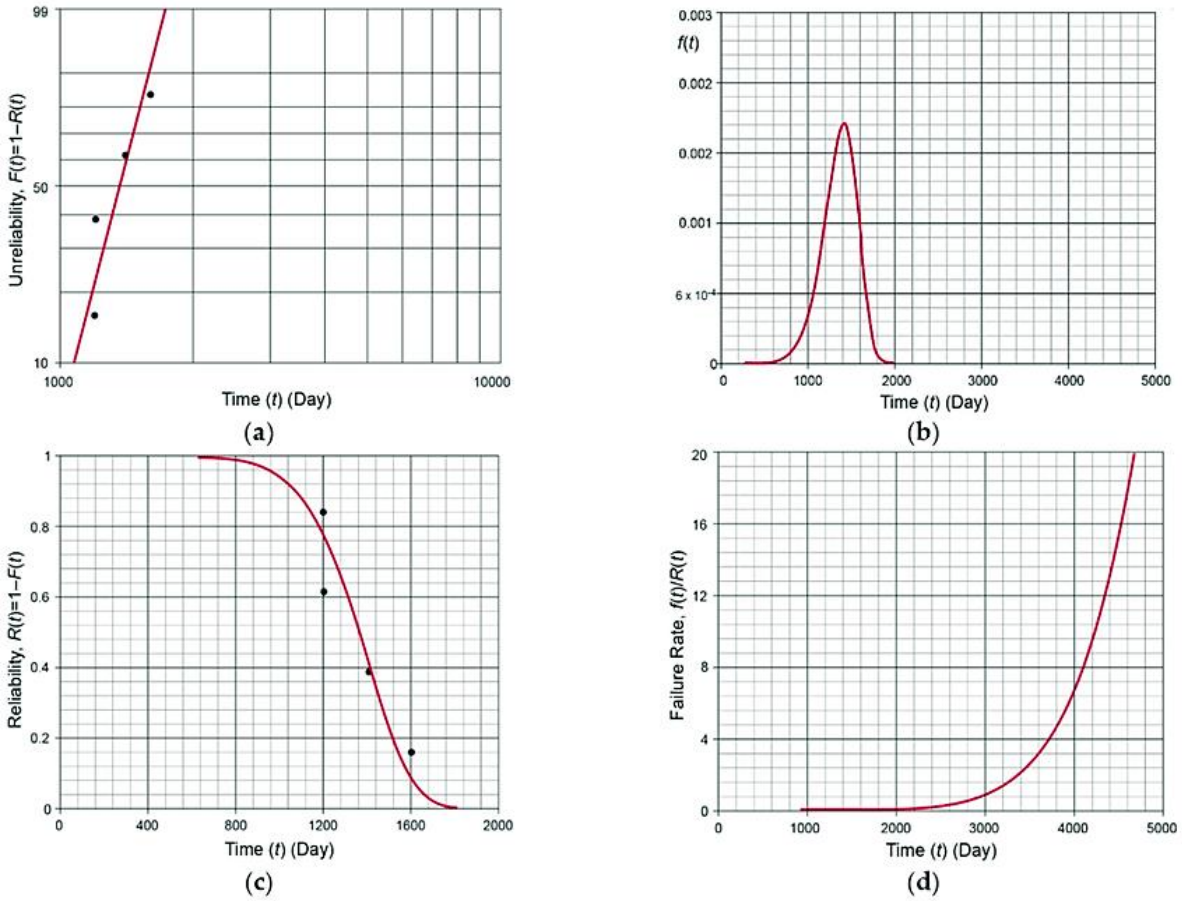

Fig. 3: Reliability Analysis (Source: Prepared by author)

Technology's quick development and the production of large amounts of data are altering how organizations and industries function. In the past, people looked at and evaluated data, and judgments were based on inferences from trends and estimated risks. Big data has revolutionized data science and accounting in the following ways: Instantaneous Data Access. The visibility of data was previously constrained by manual data recording techniques. Before the books were closed, it was difficult to finish the tasks each month [10].

5. Conclusion

The need to comprehend the difficulties involved in incorporating big data analytics into financial accounting led to the selection of this research study's title, which has been investigated from several perspectives. The study started with a thorough review of the literature on International Financial Reporting Standards. Next, the idea of financial accounting was discussed. The research methodology, findings, and debate came next. In conclusion, financial accounting must continuously research and innovate to meet the potential and problems presented by the big data era. The cornerstones are data security and privacy protection. We can only fully utilize the potential of big data if we guarantee data security. Training employees and investing in technology are essential. We can only advance in the big data era by continuously raising the technological bar and developing experts. Through these initiatives, financial accounting will help businesses stand out in the highly competitive market, encourage them to achieve more accurate and efficient financial management, and usher in a new era of development in the big data era. The findings also demonstrate how important big data is for revenue forecasting, risk and return estimation for investments, economic prospect assessment, early fraud and vulnerability detection, and improving performance reviews.

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