

Artificial Intelligence in Management Accounting: opportunities and challenges

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ABSTRACT

The digital transformation of the global economy and the simultaneous increase in the relevance of sustainability topics also necessitate changes in the field of management accounting.

The article examines the methodological challenges of measuring sustainability in particular, within the framework of the new IFRS S1 and S2 standards, addressing the phenomenon of “strategic mismatch” between external reporting and internal operational reality. The research explores the role of artificial intelligence (AI) as a structural bridge connecting these areas.

Key opportunities for the application of artificial intelligence in management accounting were analyzed, such as the use of natural language processing (NLP) to quantify unstructured ESG data, the transition to proactive risk management through predictive analytics, and the methodological synergy between artificial intelligence and the Analytic Hierarchy Process (AHP).

“Concerns about data reliability”, “the nature of algorithms”, and other ethical implications are identified as challenges.

The authors conclude that while artificial intelligence is indeed a key driver of accounting transformation, its effectiveness also depends on the application of professional judgment, and the reliability of the resulting data is linked to the effectiveness of their unified application.

Keywords: Artificial intelligence, management accounting, IFRS S1 and S2, ESG criteria, digital ethics.

Introduction

The digital age has transformed almost all aspects of socio-economic development, including imposing new stringent requirements on corporate accountability. The main challenge facing accountants today is no longer the simple recording of financial

indicators, but the continuous integration of environmental, social and governance (ESG) criteria into strategic management systems. Although IFRS S1 and S2 standards have been introduced since January 2024, the measurability of sustainability remains a complex methodological issue, due to data heterogeneity and risks of “strategic disconnection”

At the same time, it is clear that artificial intelligence can act as a key tool to address these challenges. As highlighted in a number of recent studies, it can not only contribute to the automation of data collection, but also increase the transparency of sustainability auditing and accounting processes (Adelakun et al., 2024; Risdianto et al., 2026).

The aim of this article is to conduct a qualitative analysis of the potential of artificial intelligence in management accounting, proposing an integrated framework.

ANALYSIS

Sustainability Measurement in the Context of IFRS S1 and IFRS S2

The main challenge in measuring sustainability, as outlined above, is closely linked to data quality, reliability and suitability for management decision-making. IFRS S1 and S2 provide a global framework for identifying sustainability-related risks and opportunities to meet the information needs of investors. However, from a management accounting perspective, a significant “strategic mismatch” remains: data intended for external reporting is often inconsistent with the internal organizational reality of the organization.

In this context, artificial intelligence can become a methodological and structural bridge. For example, through machine learning (ML) algorithms, organizations gain the ability to automatically classify environmental and social impacts, aligning them with the strict requirements of the IASB, which significantly mitigates the subjectivity factor. At the same time, it allows for real-time monitoring of corporate sustainability performance indicators.

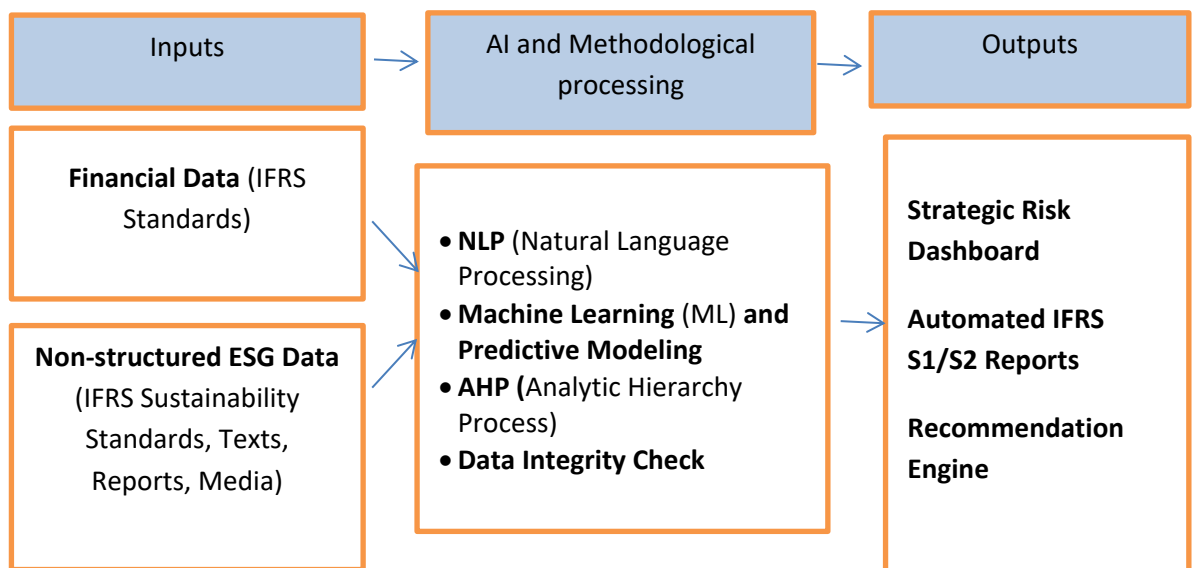


Figure1: The proposed AI-based integrated management accounting framework.

Prapered by the authors.

Figure 1 shows an AI-based integrated management accounting framework designed for corporate sustainability. The model delineates the logical flow of data transformation from primary, raw data collection to the generation of strategic outcomes. It is divided into three functional layers:

The initial phase is “data ingestion,” which integrates two different data streams:

- IFRS-based Financial Data (Structured, traditional accounting data that is needed to assess an organization’s financial position and performance), and
- Unstructured ESG Data. (This is a large and complex set of data, including text reports, sustainability disclosures (compliant with IFRS S1 and S2), media releases, and internal memos. This layer contains a large amount of qualitative information that is often difficult for traditional accounting systems to process.
 - The central “Artificial Intelligence and Methodology (Engine)” layer is the analytical core of the model, where artificial intelligence tools act as a structural bridge, connecting sustainability metrics to key aspects of the business. It includes:
 - Natural Language Processing (NLP) is useful for analyzing structured texts and stakeholder feedback. It can quantify qualitative stories and turn them into measurable data.

- Machine learning (ML) and predictive modeling can be used to uncover patterns in historical data. It can identify sustainability trends, leading to a risk management approach.
- Analytical Hierarchy Process (AHP) to integrate expert judgment into an artificial intelligence environment. This allows for the weighting of different sustainability indicators and their methodological justification, as well as their alignment with corporate strategy.
- Data Integrity Check: For automated validation. These mechanisms can ensure that information is accurate and reliable before it is included in reports.

As a result, the raw information entered becomes an actionable report, and includes:

- Strategic Risk Management Dashboard. It acts as a tool that reflects changes in real time. Therefore, it can support the decision-making process.
- Automated reports can be generated. The resulting standardized documents will comply with international sustainability standards, as well as other bases for preparation.
- Recommendation Generator: An AI-powered advisory component can make recommendations for specific interventions, helping to improve an organization's sustainability performance and other key performance indicators.

Thus, it is obvious that the application of artificial intelligence cannot replace professional work, but it can provide the technological infrastructure necessary to effectively implement new standards or other requirements in the internal management system.

AI Capabilities in Processing Qualitative Data

According to a study published in the journal VINE (Ciccola et al., 2025), artificial intelligence significantly increases the role of “intellectual capital” in accounting, providing a new dimension of data analysis. Artificial intelligence in the management accounting system provides the following key capabilities:

Natural Language Processing (NLP): Since AI can analyze large amounts of data, including press releases, internal documents, and stakeholder feedback, this is particularly important for assessing the social (S) and governance (G) pillars of

sustainable development. In these areas, the data is mostly textual, and the application of AI makes it quantitative.

Predictive analytics: As Arustamian (2025) noted, AI facilitates the transition from retrospective accounting to predictive modeling. It can identify ESG risks before they materialize, thus giving management accounting a proactive nature.

Synergy between AI and AI: Mathematical models, In particular, the Analytic Hierarchy Process (AHP) provides the necessary methodological “compass” for AI algorithms. The definition of expert weights ensures that AI-based calculations are aligned with strategic priorities, increasing transparency.

Challenges: Digital Ethics and Data Quality

Despite the obvious advantages, the integration of artificial intelligence into management accounting poses certain challenges, as highlighted by Risdianto et al. (2026).

Data Reliability: The accuracy of AI algorithms is directly dependent on the quality of the input data. The “Garbage in, garbage out” (GIGO) principle remains the most significant risk, requiring strict data validation mechanisms. **Lack of Transparency:** In a number of cases, AI decision-making algorithms are complex and not sufficiently explainable (Explainable AI - XAI), which can lead to a loss of trust among auditors and stakeholders.

Ethical responsibility: There is a risk that artificial intelligence can be used to undermine “greenwashing” practices. Therefore, the use of artificial intelligence tools must be integrated with corporate ethics and professional judgment.

CONCLUSION

The results of the analysis show that artificial intelligence (AI) is not only an additional technological tool, but can also act as a key catalyst for the transformation of management accounting. The study shows that the integration of AI can effectively solve the complex problem of measuring sustainable development by transforming multi-layered qualitative information into quantitative data, while ensuring its consistency with the strategy.

The results of the analysis confirm that the effective implementation of IFRS S1 and S2 standards, as well as the mitigation of “strategic mismatch”, can be ensured through the proposed integrated framework (Figure 1). Using NLP and predictive modeling,

organizations can move from retrospective reporting to forward-looking risk management. Furthermore, the study highlights that the synergy between artificial intelligence and mathematical analytical models is important to maintain transparency and align algorithmic results with expert judgment.

However, technological advances should not lead to a reduction in the role of professional judgment. The combination of human expertise and advanced technology remains the only guarantee of data integrity in the context of modern digital uncertainty.

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