

EMPOWERING EXPORT SMES THROUGH AN INTEGRATED ACCOUNTING INFORMATION SYSTEM FOR GREEN ACCOUNTING AND ESG PERFORMANCE

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Abstract

Export-oriented Small and Medium Enterprises (SMEs) are increasingly required to adopt sustainable business practices to meet international market expectations regarding environmental, social, and governance (ESG) performance. However, many SMEs still rely on conventional accounting systems that are unable to integrate financial and sustainability information, limiting their ability to implement Green Accounting and prepare ESG reports. This international community engagement program aimed to empower Nutsafir Cookies SME through the development and implementation of an Integrated Accounting Information System that incorporates Green Accounting and ESG performance measurement. The program employed a participatory approach consisting of four stages: preliminary assessment, capacity-building workshops, participatory system development, technical training and mentoring, and monitoring and evaluation. The implemented system integrated financial, environmental, social, and governance information into a unified digital platform, enabling more systematic recording, monitoring, and reporting of sustainability performance. The program enhanced participants' understanding of Green Accounting and ESG principles, improved accounting quality and organizational transparency, and strengthened managerial decision-making through the availability of integrated financial and non-financial information. Furthermore, the initiative increased the enterprise's readiness to prepare sustainability reports and respond to the sustainability requirements of international markets. This program provides a practical and replicable model for strengthening sustainability governance among export-oriented SMEs by integrating digital accounting systems, Green Accounting, and ESG performance measurement to support long-term business sustainability and international competitiveness.

Keywords: Integrated Accounting Information System; Green Accounting; Environmental, Social, and Governance (ESG); Export SMEs; Business Sustainability.

INTRODUCTION

Export-oriented Small and Medium Enterprises (SMEs) play a strategic role in promoting economic growth, employment generation, and international trade. As globalization intensifies, export SMEs are increasingly expected to comply not only with product quality standards but also with sustainability requirements imposed by international markets. Buyers, investors, and global supply chain partners now demand greater transparency regarding environmental practices, social responsibility, and corporate governance. Consequently, sustainability is no longer viewed solely as a voluntary corporate initiative but has become a strategic business imperative for SMEs seeking to strengthen competitiveness, access global value chains, and respond to evolving international market requirements (OECD, 2023; World Bank, 2023).

The Environmental, Social, and Governance (ESG) framework has become one of the most widely adopted approaches for evaluating corporate sustainability and responsible business conduct. ESG practices enable organizations to integrate environmental protection, social responsibility, and ethical governance into business operations while simultaneously improving organizational resilience and stakeholder trust. Previous studies have consistently reported that effective ESG implementation contributes positively to financial performance, innovation capability, corporate reputation, investment attractiveness, and long-term business sustainability (Gerged et al., 2024). Moreover, ESG disclosure has become increasingly important for export-oriented firms because international customers and multinational corporations often require sustainability information as part of supplier qualification and procurement processes (IFAC, 2023).

Despite the increasing importance of ESG, its implementation remains challenging for many SMEs, particularly in developing countries. Limited financial resources, inadequate digital capabilities, insufficient managerial expertise, and the absence of integrated information systems prevent many SMEs from effectively monitoring and reporting sustainability performance (OECD, 2023). Unlike large corporations that possess sophisticated sustainability reporting systems, SMEs often rely on conventional accounting practices that focus solely on financial transactions while overlooking environmental expenditures, social impacts, and governance indicators. Consequently, sustainability-related information remains fragmented, making ESG reporting difficult and reducing SMEs' ability to demonstrate responsible business practices to international stakeholders (O'Reilly et al., 2023).

Green Accounting, commonly operationalized through Environmental Management Accounting (EMA), has emerged as an important managerial approach that supports sustainable business management by incorporating environmental costs into accounting and decision-making processes. It enables organizations to identify, measure, and report environmental expenditures related to energy consumption, material use, waste management, emissions, and resource efficiency (Burritt et al., 2023). The integration of Green Accounting, particularly through Environmental Management Accounting (EMA), has been shown to improve environmental performance, support more efficient resource utilization, facilitate environmentally informed managerial decision-making, and strengthen corporate sustainability (Qian et al., 2018; Huynh & Nguyen, 2024). Furthermore, Green Accounting provides quantitative information required to support ESG reporting and sustainability disclosure, enabling organizations to communicate their environmental commitment more effectively to stakeholders.

The rapid development of digital technologies has fundamentally transformed accounting practices by enabling organizations to integrate financial and non-financial information within a single Accounting Information System (AIS). Modern digital accounting systems extend beyond traditional bookkeeping by supporting real-time data processing, integrated business processes, environmental accounting, ESG information management, and sustainability reporting (Romney et al., 2021; Antonini, 2024; Lodhia et al., 2025). Recent research has highlighted that Digital Accounting Information Systems serve as strategic enablers of sustainability accounting by improving data quality, organizational transparency, managerial decision-making, and integrated reporting (Moll & Yigitbasioglu, 2019; Gerged et al., 2024). Consequently, integrating Green Accounting and ESG reporting into digital accounting systems offers SMEs an effective mechanism for improving sustainability governance while enhancing operational efficiency.

Several empirical studies have confirmed the positive relationship between digital transformation, accounting information systems, and sustainable business performance. Digital transformation has been shown to enhance SMEs' innovation capability, improve operational

efficiency, and strengthen sustainability and ESG performance through the adoption of digital technologies and integrated management practices (Wang & Esperança, 2023; Kim & Ha, 2023). Similarly, Gerged et al. (2024) emphasized that digital technologies are becoming indispensable tools for sustainability accounting, ESG reporting, and assurance practices. Huynh and Nguyen (2024) further demonstrated that Environmental Management Accounting significantly improves environmental and organizational performance by facilitating environmentally informed managerial decisions. However, previous research has largely examined Green Accounting, ESG implementation, and Accounting Information Systems as separate concepts. Limited attention has been devoted to developing an integrated accounting information system specifically designed to support Green Accounting and ESG performance among export-oriented SMEs, particularly in emerging economies such as Indonesia.

One Indonesian export-oriented SME with strong sustainability potential is Nutsafir Cookies, operating under CV. Safir Indo Raya in Mataram, West Nusa Tenggara. Established in 2012, the company produces healthy grain-based cookies made from locally sourced agricultural products without preservatives, artificial colors, or artificial sweeteners. Nutsafir Cookies has obtained Halal and BPOM certifications, received national recognition as Indonesia's Best Halal SME, and successfully entered international markets through export programs. In addition to its commercial achievements, the company demonstrates a strong commitment to social sustainability by employing 100% local women in its production activities while empowering local farmers through sustainable sourcing partnerships. These characteristics indicate substantial alignment with ESG principles, although sustainability information has not yet been systematically managed through an integrated accounting information system.

Preliminary observations revealed that Nutsafir Cookies continues to employ conventional accounting practices primarily focused on financial transactions. Environmental costs, resource utilization, employee welfare indicators, waste management activities, and governance-related information are recorded separately or not documented at all. Consequently, the enterprise lacks a comprehensive mechanism for measuring ESG performance, preparing sustainability reports, and communicating sustainability achievements to international stakeholders. This limitation may reduce the company's ability to comply with evolving sustainability requirements in global markets and to leverage its existing sustainability initiatives as a source of competitive advantage.

To address these challenges, this international community engagement program aims to empower export SMEs through the development and implementation of an Integrated Accounting Information System that incorporates Green Accounting and ESG performance measurement. The program consists of capacity-building workshops, technical training, participatory system development, and continuous mentoring to strengthen SMEs' capabilities in sustainability accounting and digital financial management. The integrated system enables the systematic recording of financial, environmental, social, and governance information, thereby improving accounting quality, facilitating ESG reporting, enhancing managerial decision-making, and supporting sustainable business development.

RESEARCH METHODS

This international community engagement program adopted a participatory approach involving close collaboration between the university team and Nutsafir Cookies SME. The program aimed to develop and implement an Integrated Accounting Information System that combines Green Accounting and Environmental, Social, and Governance (ESG) performance measurement to strengthen sustainable business management. The implementation was conducted through

four sequential stages: preliminary assessment, capacity-building and technical training, participatory system development and mentoring, and monitoring and evaluation. A preliminary assessment was carried out through field observations, interviews with the SME owner, and reviews of existing accounting and sustainability practices. The assessment identified four major problems that constrained the enterprise's ability to implement Green Accounting and ESG-oriented business management. Based on these findings, intervention strategies were formulated as presented in Table 1.

Table 1. Problems Identified and Proposed Solutions

NO	Problems Identified	Proposed Solutions
1	Conventional accounting practices that focused primarily on financial transactions and did not integrate environmental and social information.	Develop and implement an Integrated Accounting Information System capable of combining financial and non-financial information within a single digital platform.
2	Absence of Green Accounting practices, resulting in environmental costs, resource utilization, and waste management activities not being systematically identified or measured	Provide training and technical assistance on Green Accounting, including environmental cost identification, resource efficiency measurement, and environmental performance recording.
3	Limited implementation of ESG performance measurement and sustainability reporting, preventing the enterprise from systematically documenting ESG activities and communicating sustainability performance to stakeholders.	Conduct ESG capacity-building workshops and integrate ESG indicators into the accounting information system to facilitate ESG monitoring and sustainability reporting.
4	Limited digital capability and managerial capacity in utilizing accounting information for strategic decision-making and sustainable business management.	Deliver technical training, participatory system development, and continuous mentoring to improve digital accounting competencies and managerial decision-making capabilities.

RESULTS AND DISCUSSION

The international community engagement program was implemented collaboratively between the university team and Nutsafir Cookies SME to strengthen sustainable business management through an Integrated Accounting Information System incorporating Green Accounting and Environmental, Social, and Governance (ESG) performance measurement. The intervention addressed the four major challenges identified during the preliminary assessment through technology adoption, capacity building, participatory system development, and continuous technical assistance. The implementation results are summarized in Table 2.

Table 2. Results of the Community Engagement Program

Problem	Solution Implemented	Implementation Activities	Result Achieved
Conventional accounting practices focused only on financial transactions.	Development and implementation of an Integrated Accounting Information System.	Assessment of existing accounting practices; system requirement analysis; design of an integrated accounting information system; training on digital	Integrated recording of financial and non-financial information; improved accounting accuracy and efficiency; enhanced data accessibility; better managerial decision-

				transaction recording; making. assistance in daily system utilization.
Absence of Green Accounting practices.	Green Accounting and technical assistance.	training	Identification of environmental costs; classification of environmental expenditures; recording of resource consumption and waste management activities; mentoring on environmental cost reporting.	Systematic identification of environmental costs; improved resource efficiency awareness; better environmental performance monitoring; stronger environmental accountability.
Limited ESG performance measurement and sustainability reporting.	ESG capacity-building and integration of ESG indicators into the accounting system.	and	Introduction to ESG principles; identification of ESG activities; development of ESG indicators; integration of ESG data into the accounting system; sustainability reporting guidance.	Improved ESG understanding; systematic documentation of sustainability activities; increased readiness to prepare ESG reports; enhanced organizational transparency.
Limited digital capability and managerial capacity.	Technical training, participatory system development, and continuous mentoring.	and	Digital accounting workshops; practical system implementation; hands-on mentoring; evaluation of accounting reports; managerial consultation	Improved digital competencies; increased confidence in using accounting information; stronger strategic planning capability; enhanced business sustainability management.

Table 2 demonstrates that each identified problem was addressed through a specific intervention that combined technological innovation with organizational capacity development. Rather than focusing solely on accounting digitalization, the program integrated Green Accounting and ESG performance measurement into daily business operations, enabling the enterprise to generate comprehensive financial and sustainability information for strategic decision-making.

CONCLUSION

This international community engagement program successfully demonstrated that the development and implementation of an Integrated Accounting Information System incorporating Green Accounting and Environmental, Social, and Governance (ESG) performance measurement can strengthen sustainable business management among export-oriented SMEs. The program effectively addressed four key challenges identified during the preliminary assessment, namely conventional accounting practices, the absence of Green Accounting implementation, limited ESG performance measurement and sustainability reporting, and insufficient digital and managerial capabilities.

Through a participatory approach involving capacity-building workshops, technical training, participatory system development, and continuous mentoring, the partner successfully improved its accounting practices by integrating financial and non-financial information into a unified digital platform. The implementation of Green Accounting enabled the systematic identification and recording of environmental costs, while the integration of ESG indicators enhanced sustainability

monitoring, reporting, and organizational transparency. Furthermore, strengthening participants' digital competencies improved the use of accounting information for strategic planning and evidence-based managerial decision-making.

The integrated accounting system not only enhanced accounting quality and operational efficiency but also increased the enterprise's readiness to comply with international sustainability requirements and stakeholder expectations. By generating comprehensive financial, environmental, social, and governance information, the system supports better sustainability governance and strengthens the competitive position of export-oriented SMEs in global markets.

This community engagement initiative offers a practical and replicable model for integrating digital accounting, Green Accounting, and ESG performance measurement within SMEs. Future programs are recommended to expand the implementation of this integrated framework to other export-oriented SMEs and evaluate its long-term impact on sustainability reporting quality, environmental performance, organizational resilience, digital transformation, and international business competitiveness.

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