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The Role of Management Accounting in Sustainability

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Abstract

The background of this research is that economic development in the era of globalization requires every company to strategize in increasing the ability to compete globally. Responding to environmental and social issues that occur in business encourages the role of management accounting to encourage corporate sustainability. The purpose of the problem in this study is to find out how management accounting helps companies achieve sustainability. This study also discusses what management accounting approaches are used. The research method used is the systematic literature review (SLR) method with a total of 27 scopus articles using the watase tool. The results showed that environmental management accounting (EMA) is one of the most widely used management accounting approaches according to previous research. In addition, the use of corporate management accounting is able to provide appropriate strategies related to the quality of service and production processes of the company so as to encourage the sustainability of the company.

Keywords: *Accounting Management, Sustainability, Manufacturing.*

INTRODUCTION

Economic developments in globalization era make every manufacturing industry company should develop strategies in order to improve the company's ability to compete globally. The chosen strategy will be the basis and planning for realizing the company's goals set by management. However, if there are no positive environmental and social strategies or initiatives, manufacturing activities will produce large amounts of waste, exploitation of natural resources and excessive energy consumption (Fuzi et al., 2022).

Questions regards to social and environmental impacts still get less attention in operational decision-making processes compared to economic benefits. Although integration into business management is now common practice in companies; especially, when certification and/or reporting

is in process, it rarely result correct decisions in a regulative economic sense, whether in terms of planetary boundaries or socially acceptable target conditions (Miehe et al., 2022).

Responding to environmental and social issues which surround business, management accounting draws attention to quality disclosure and reporting of cost activities (Kelsall, 2020). Newly added disclosure requirements that are related to environmental protection and poverty alleviation can complement the CSR disclosures in the company's annual report. Meanwhile, for external stakeholders, both domestic and international, sustainability accounting creates meaningful indicators and information so that it provides a credible basis for evaluating sustainable business performance and for decision making on many sustainability issues (Shen et al., 2020).

Therefore, based on the background above, this study aims to know how management accounting can help companies achieve sustainability. In order to achieve this goal, first part of the results of this study will discuss what approaches in management accounting are in achieving sustainability. Meanwhile, in the second part, it will explain the role of management accounting in order to help companies achieve sustainability.

LITERATURE REVIEW

1. Legitimacy Theory

It is based on the idea that organizations and the social contexts in which they function have social contract. Organizational legitimacy can be considered as something that society provides to companies and something that companies actively seek from society (Amalia et al., 2022). Furthermore, according to legitimacy theory, companies should uphold the rights of ordinary people in addition to the rights of investors. Since there is a reciprocal relationship between the two entities that are the organization and the environment, legitimacy is an advantage or resource which allows a business to continue to exist (going concern).

Within the sustainability management accounting framework, legitimacy theory highlights that accounting procedures which require measuring and disclosing sustainability performance are designed in order to ensure that organizations have approval and support from society (Akhter et al., 2023). As a result, the organization can remain have good reputation with its social environment; besides, can minimize the possibility of losing support. Maintaining and enhancing organizational legitimacy by integrating sustainability management accounting becomes an important tool for understanding and disclosing organizational involvement in social and environmental challenges. In addition, Jiao et al. (2023) in their study showed that companies that effectively integrate sustainability concepts into their management accounting systems can increase resource accessibility, win the trust of stakeholders, and build sustainable competitive advantages.

2. Management Accounting

Management accounting has experienced rapid development since the beginning of the 20th century. In the early stages of its development, it was oriented towards determining product costs by tracking individual product profitability and using this information for strategic decision

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making for company leaders and other internal users. Management accounting has an important role in supporting corporate sustainability by providing relevant and timely information for decision making which are focused on business performance, environment and sustainability. The role of management accounting can assist in developing budgets and analyzing company performance in order to ensure social, environmental and financial sustainability. In addition, it allows managers to make better decisions regards to allocating costs and resources in order to achieve their sustainability goals (Burhany, 2012).

In the context of corporate sustainability, management accounting can assist in identifying, evaluating, and managing social and environmental risks, as well as providing the information necessary in order to reduce an organization's environmental impact, understand dependencies, increase the social good created by an organization's activities, and to give positive economic impact that is fair and equitable. The last decade shows that pressure from external stakeholders on regulations and initiatives provided by managers have increased the relevance of accounting and sustainability reporting in many companies (Cho et al., 2020). Thus, it increasingly shows that the role of management accounting is very important in order to encourage company sustainability.

3. Sustainability Accounting

Developments in the domain of accounting science emerge as a result of the process of growth, development and organization transformation. When organizations experience development over time, they create accounting mechanisms which have function to maintain stability and increase operational efficiency. The sustainability process requires structural and systematic development which has an impact on transformative change (Scoones et al., 2020). Furthermore, decisions related to changes in accounting rules can be initiated by decision makers and/or stakeholders. Meanwhile, company is one of the main factors which contribute to economic, environmental and social prosperity. Company activities in the present have an impact in the future so that company sustainability is necessary for long-term sustainability of economic and societal development.

The term sustainability accounting contains the meaning of accounting methods and accounting information management which aims to provide information in order to support companies in their sustainability efforts. Moreover, sustainability accounting is considered an innovation in the field of accounting which emerges as a result of dynamic changes in organizations (Ascani et al., 2021). The conceptualization of sustainability accounting can be broadly defined as a strategy of business organizations which integrate companies with their external and internal environments. In addition, economics, business and production interaction is reflected in company operations through financial, social and environmental performance dimensions (Talitha, 2022). Since sustainability accounting produces useful data and indicators, it offers a reliable basis for assessing sustainable business performance and for taking decisions on various issues related to sustainability issues.

Research Method

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The method used in this study was the Systematic Literature Review (SLR) method. It takes an approach which can identify, study, select, evaluate, and interpret research journal articles that are relevant to certain research questions, topics, or phenomena. This SLR aims to present an objective evaluation of a research theme by using a reliable, rigorous and auditable methodology (Putri et al., 2023). Furthermore, by using the SLR method, researchers collect results and literature in order to present the latest information regards to the role of management accounting in helping company sustainability; besides, SLR method is used to know what management accounting approaches are used in order to achieve sustainability. This study focuses on articles that discuss manufacturing companies. Therefore, this study is expected not only to provide a theoretical contribution to existing literature, but also it can provide practical insights which can help manufacturing companies in order to achieve sustainability.

RESULT AND DISCUSSION

1. Research Result

a. Research Questions (RQs)

Research Questions (RQs) are created based on needs and the chosen topic. The following are the questions in this study:

1) RQ1: What are the approaches in management accounting in achieving sustainability?
2) RQ2: How is the role of management accounting in order to help companies in achieving sustainability?

b. Search Process

The search process is used to obtain relevant sources in order to answer Research Questions (RQs) and other related reference searches. Literature searches were conducted through the Watase Uake online application with one of its features being Systematic Literature Review with PRISMA. The keywords used in the search were:

1) Accounting Management
2) Sustainability
3) Manufacturing

c. Study Identification and Selection

In order to find relevant studies, this study uses a tool that is Watase Uake, with criteria as follows.

Criteria	Limitation
Year from	2018
Year to	2023
Q1, Q2, Q3, Q4	

From 133 articles available in the first stage, that was identification, 86 were filtered since 39 were not included in the articles from 2018-2023, 6 articles were not included in Q1, Q2, Q3, Q4, and 2 articles did not have abstracts for screening. After the first stage, the articles were screened by viewing and reading the abstract of the research and resulting in 39 articles to be used in the

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next stage. After that, the articles were checked in order to see whether they were in accordance with the data required for open access which could be downloaded or read so that 27 articles were found to be used as data for this study.

After the researcher conducted a literature search which was appropriate to the topic to be discussed, the diagram below shows the year of publication of the articles found after conducting the data search:

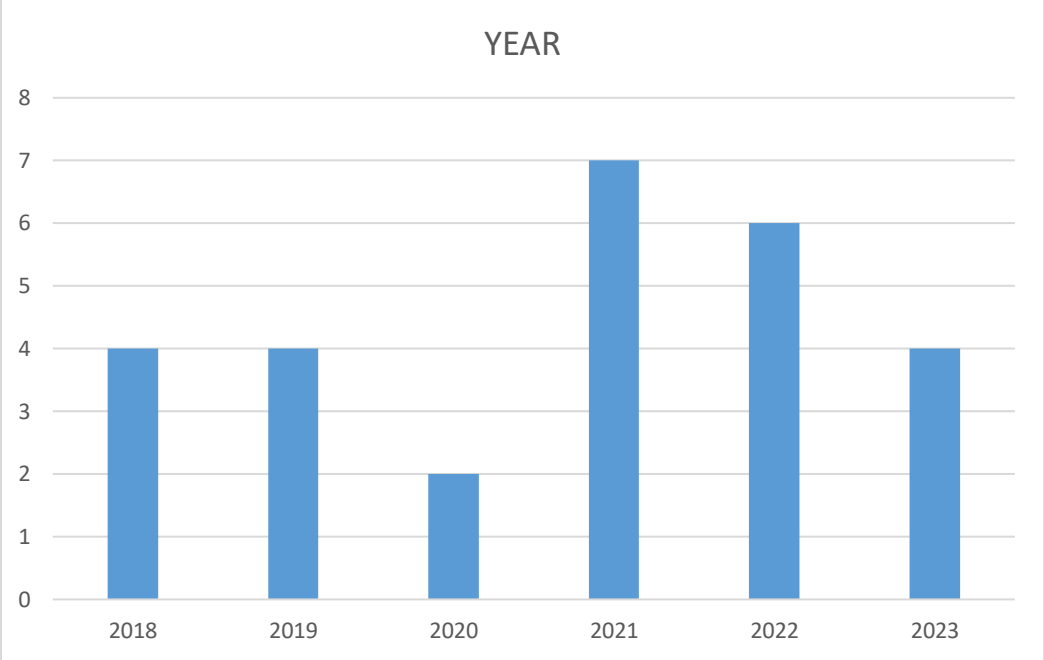

Figure 1. Number of articles with publication year

From Figure 1, it shows that the number of literature publications related to the role of management accounting in sustainability in manufacturing companies in 2018 and 2019 was 4 articles, 2020 was 2 articles, 2021 was 7 articles, 2022 was 6 articles, and 2023 was 4 articles. The Scopus Quartile (Q) levels can be seen based on the figure below:

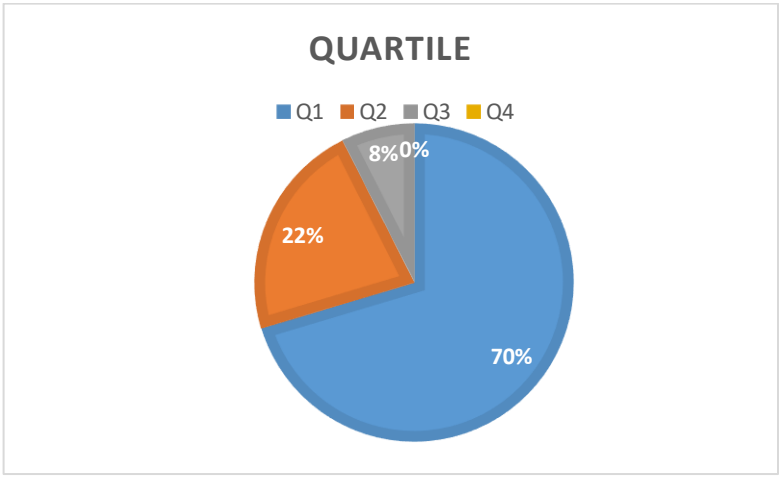

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Figure 2. Scopus Quartile Distribution

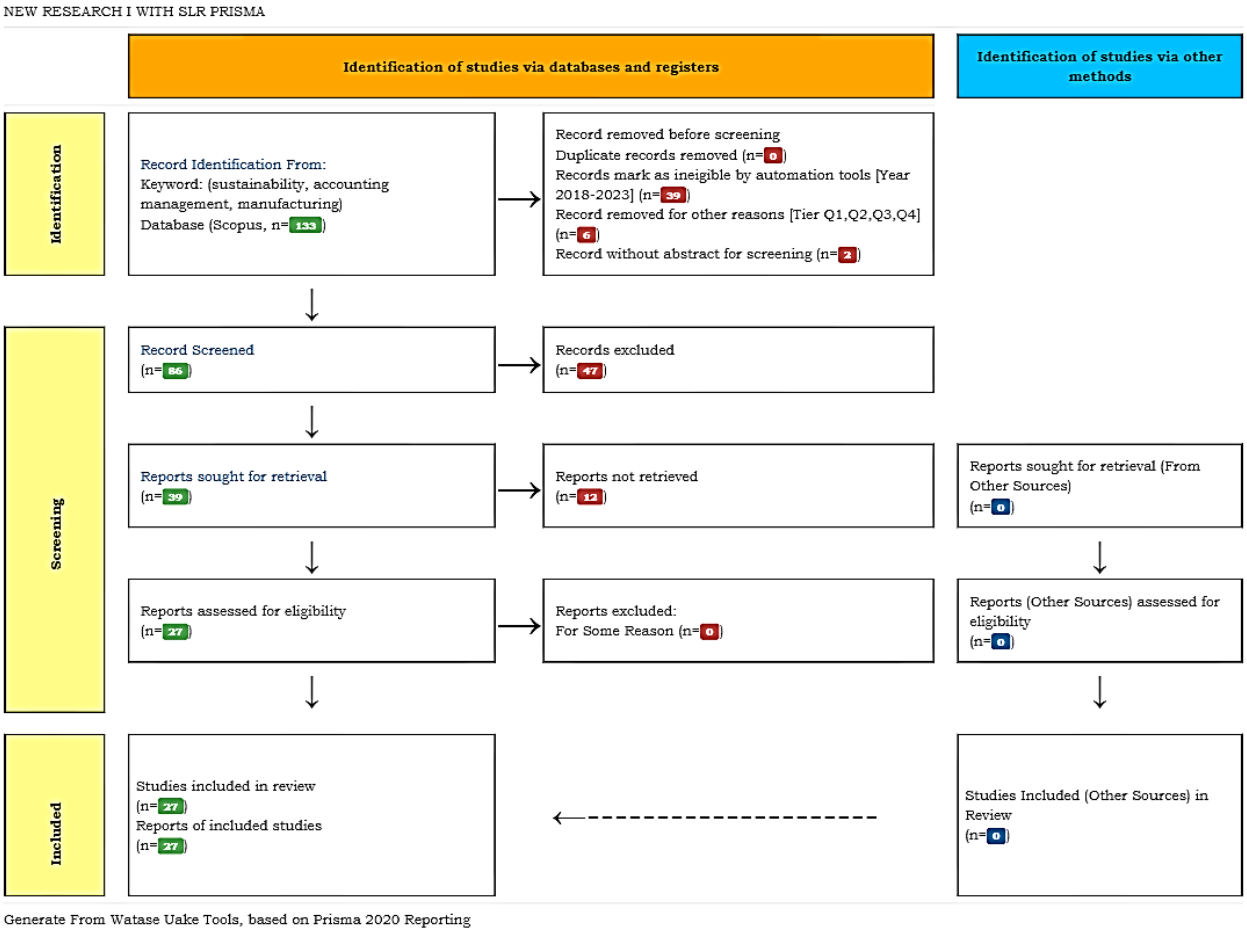

Table 1. Journal Classification Table

No.	Year	Author	Title	Journal	Quartile
1	2020	Naveed Iqbal Chaudhry, dan Muhammad Amir	From institutional pressure to the sustainable development of firm: Role of environmental management accounting implementation and environmental proactivity	Business Strategy and the Environment	Q1

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2	2021	Enrica Leccisi dan Vasilis Fthenakis	Life Cycle Energy Deman and Carbon Emissions of Scalable Single-Junction and Tandem Perovskite PV	Progress in Photovoltaics: Research and Applications	Q1
3	2019	Matthew Egan	Sense-Making Resource Efficiency Through "Sustainability" Reports	Journal of Business Ethics	Q1
4	2018	Sujit Singh, Ezutah Udoncy Olugu, Siti Nurmaya Musa, dan Abu Bakar Mahat	Fuzzy-based Sustainability Evaluation Method for Manufacturing SMEs Using Balanced Scorecard Framework	Journal of Intelligent Manufacturing	Q1
5	2021	Carlos Cuviella-Suarez, Antonio Colmenar-Santos, dan David Borge-Diez	Thermal Energy Reduction in Sanitary-Ware Industy by Heat-Recoving Thermal Engineering Technologie	Energy Efficiency	Q2
6	2023	S.V. Ramanaiah, K Chandrasekhar, Cristina M. Cordas, dan Irina Potoroko	Bioelectrochemical Systems (BESs) for Agro-food Waste and Wastewater Treatment, and Sustainable Bionergy-A review	Environmental Pollution	Q1
7	2019	Prerna Gautam, Aakankhsaha Kishore, Aditi Khanna, dan Chandra K. Jaggi	Strategic Defect Management for A sustainable Green Supply Chain	Journal of Cleaner Production	Q1
8	2021	Chen Peng, Tao Peng, Yang Liu, Martin Geissdoerfer, Steve Evans, dan Renzhong Tang	Industrial Internet of Thing Enabled Supply-Side Energy Modelling for Refined Energy Management in Aluminium Extrusions Manufacturing	Journal of Cleaner Production	Q1

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9	2021	Nicholas Goffin, Lewis C.R. Jones, John Tyrer, Jinglei Ouyang, Paul Mativenga, dan Elliot Woolley	Mathematical Modelling for Energy Efficiency Improvement in Laser Welding	Journal of Cleaner Production	Q1
10	2021	Fouzia Hadi Ali, Faiza Liaqat, Shumaila Azhar, dan Muhammad Ali	Exploring the quantity and quality of occupational health and safety disclosure among listed manufacturing companies: Evidence from Pakistan, a lower-middle income country	Safety Science, Elsevier	Q1
11	2018	Stefan Schaltegger	Linking Environmental Management Accounting: A Reflection on (Missing) Links to Sustainability and Planetary Boundaries.	Social and Environmental Accountability Journal	Q3
12	2018	Delphine Gibassier dan Simon Alcouffe	Environmental Management Accounting: The Missing Link to Sustainability?	Social and Environmental Accountability Journal	Q3
13	2021	Faisal Mahmood, Faisal Qadeer, Maria Saleem, Heesup Han dan Antonio Ariza-Montes	Corporate Social Responsibility and Firms' Financial Performance: A Multi-Level Serial Analysis Underpinning Social Identity Theory	Economic Research-Ekonomska Istraživanja	Q2
14	2022	Xiaojing Jiao, Pengwei Zhang, Liying He dan Zeyun Li	Business Sustainability for Competitive Advantage: Identifying the Role of Green Intellectual Capital, Environmental	Economic research	Q2

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			Management Accounting and Energy Efficiency		
15	2022	Smangele Nzama, Odunayo Magret Olarewaju, Omolola A Arise dan Idris Ganiyu	Environmental Management Accounting (EMA) Practices and Plastic Pollution Control in Selected Food and Beverage Firms	Cogent Business & Management	Q2
16	2019	Dennis M. Patten dan Hyemi Shin	Sustainability Accounting, Management and Policy Journal's Contributions to Corporate Social Responsibility Disclosure Research: A Review and Assessment	Sustainability Accounting, Management and Policy Journal, Emerald	Q1
17	2020	Hongtao Shen, Artie W. Ng, John Zhang, dan Liyan Wang	Sustainability Accounting, Management and Policy in China: Recent Developments and Future Avenues	Sustainability Accounting, Management and Policy Journal, Emerald	Q1
18	2019	Charles H. Cho, Anna Kim, Michelle Rodrigue, dan Thomas Schneider	Towards a Better Understanding of Sustainability Accounting and Management Research and Teaching in North America: A Look at the Community	Accounting and management research, Emerald	Q1
19	2022	Sasmoko; Zaman, K.; Malik, M.; Awan, U.; Handayani, W.; Jabor, M.K.; Asif, M.	Environmental Effects of Bio-Waste Recycling on Industrial Circular Economy and Eco-Sustainability	Recycling	Q2

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20	2018	Assunta Di Vaio dan Luisa Varriale	Management Innovation for Environmental Sustainability in Seaports: Managerial Accounting Instruments and Training for Competitive Green Ports beyond the Regulations	Sustainability	Q1
21	2020	Chris A. Kelsall	Ecological Management Accounting - Taking into Account Sustainability, Does Accounting Have Far to Travel?	Sustainability	Q1
22	2021	Jing Liu, Yongping Li, Gordon Huang, Yujin Yang dan Xiaojie Wu	A Factorial Ecological-Extended Physical Input-Output Model for Identifying Optimal Urban Solid Waste Path in Fujian Province, China	Sustainability	Q1
23	2022	Robert Miehe, Matthias Finkbeiner, Alexander Sauer dan Thomas Bauernhansl	A System Thinking Normative Approach towards Integrating the Environment into Value-Added Accounting - Paving the Way from Carbon to Environmental Neutrality	Sustainability	Q1
24	2022	Nursyazwani Mohd Fuzi, Sabrinah Adam, Mohamad Rohieszan Ramdan, Sharon Yong Yee Ong, Juliana	Sustainability Management Accounting and Organizational Performance: The Mediating Role of	Sustainability	Q1

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		Osman, Subramaniam Kolandan, Siti Zubaidah Mohd Ariffin, Nor Sa'adah Jamaluddin dan Karmilah Abdullah	Environmental Management System		
25	2023	Abeer M. Abdelhalim, Nahla Ibrahim dan Mohammed Alomair	The Moderating Role of Digital Environmental Management Accounting in the Relationship between Eco-Efficiency and Corporate Sustainability	Sustainability	Q1
26	2023	Torky Althaqafi	Cultivating Sustainable Supply Chain Practises in Electric Vehicle Manufacturing: A MCDM Approach to Assessing GSCM Performance	World Electric Vehicle Journal	Q2
27	2023	Giang Nguyen Phu	Factors Affecting the Use of Best Available Techniques and the Impact on Business Sustainability	International Journal of Asian Business and Information Management	Q1

DISCUSSION

RQ1. What are the approaches in management accounting in achieving sustainability?

Table 2. Accounting Management Approach

No	Approach	Total	Reference
1	Environmental Management Accounting (EMA)	7	(Chaudhry & Amir, 2020), (Egan, 2019), (Gibassier & Alcouffe, 2018), (Jiao et al., 2023), (Nzama et al., 2022), (Sasmoko et al., 2022), (Abdelhalim et al., 2023)

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2	Life Cycle Analysis (LCA)	1	(Leccisi & Fthenakis, 2021)
3	Net Energy Analysis (NEA)	1	(Leccisi & Fthenakis, 2021)
4	Fuzzy-based Sustainability	1	(Singh et al., 2018)
5	Balanced Scorecard	1	(Singh et al., 2018)
6	Energy Management Accounting (EMA)	1	(Cuviella-Suárez et al., 2021)
8	Bioelecthrochemical Systems (BESs)	1	(Ramanaiah et al., 2023)
9	Green Supply Chain Management	2	(Gautam et al., 2019), (Althaqafi, 2023)
10	Refined Energy Consumption Information (RECI)	1	(Peng et al., 2021)
11	Whole-System Energy Analysis	1	(Goffin et al., 2021)
12	Innovative Management Accounting Approach	2	(Schaltegger, 2018), (Di Vaio & Varriale, 2018)
13	Benchmarking Technologius	2	(Ali et al., 2021), (Mahmood et al., 2021)
14	Sustainability Management Accounting	3	(Patten & Shin, 2019), (Cho et al., 2020), (Fuzi et al., 2022)
15	Bottom-Up Approach	1	(Shen et al., 2020)
16	Ecological Management Accounting	1	(Kelsall, 2020)
17	A Factorial Ecological-Extended Physical Imput-Output Midel (FE-PIOM)	1	(Liu et al., 2021)
18	Life Cycle Assessment (LCA)	1	(Miehe et al., 2022)
19	Best Available Techniques (BAT)	1	(Phu, 2023)

In this study, we assess the literature reviewed from the perspective of management accounting for achieving sustainability. Articles were grouped into the category of management accounting approaches used by literature reviews to be applied by manufacturing companies in achieving sustainability. The results are shown in Table 1 which shows that of all management accounting approaches the most frequently used in the studies reviewed, with 7 articles out of 27, Environmental Management Accounting is the most frequently used approach for study [(Chaudhry & Amir, 2020), (Egan, 2019), (Gibassier & Alcouffe, 2018), (Jiao et al., 2023), (Nzama et al., 2022), (Sasmoko et al., 2022), (Abdelhalim et al., 2023)].

Every company, especially, manufacturing, faces environmental challenges which are directly related to corporate sustainability. Therefore, companies need an environmental strategy which can encourage companies in order to achieve sustainability (Nzama et al., 2022). Thus, the application of Environmental Management Accounting (EMA) in the literature review helps

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develop and implement strategies in order to improve environmental performance to support company sustainability [(Chaudhry & Amir, 2020), (Egan, 2019), (Gibassier & Alcouffe, 2018), (Jiao et al., 2023). In addition, by implementing EMA, companies can maintain environmental efficiency and environmental sustainability in order to achieve corporate sustainability [(Sasmoko et al., 2022), (Abdelhalim et al., 2023)].

Due to increasing concern for the environment, researchers are focusing more on Environmental Management Accounting (EMA) practices among manufacturing companies. EMA was developed as a response to the problems that is faced by traditional Management Accounting systems related to environmental operations. In addition, implementing Environmental Management Accounting is important since conventional Management Accounting systems classify environmental costs as only one of the overhead costs (Nzama et al., 2022).

EMA offers new ways to explore the relationship of EMA itself to the context of sustainable development. It is influenced by EMA's focus on natural environmental issues so that it can encourage company sustainability (Gibassier & Alcouffe, 2018). Furthermore, one of EMA's main contributions is to help translate and choose macro-level objectives into managerial action plans. EMA is described as an integration of financial and cost accounting which aims to reduce the level of costs, impacts and environmental risks created by top management as a solution in order to achieve sustainability (Jiao et al., 2023).

RQ2. How is the Role of Management Accounting to Help Companies Achieve Sustainability?

Through management accounting, companies are able to improve the company's environmental performance. Companies are able to create policies in order to control the environmental impact of business and improve environmental conditions in order to achieve sustainability. The implementation of management accounting provides a company overview of the impact of company operations on the company's environment [(Chaudhry & Amir, 2020), (Leccisi & Fthenakis, 2021), (Cuviella-Suárez et al., 2021), (Goffin et al., 2021), (Jiao et al., 2023), (Nzama et al., 2022), (Sasmoko et al., 2022), (Di Vaio & Varriale, 2018), (Liu et al., 2021), (Phu, 2023) dan (Althaqafi, 2023), (Fuzi et al., 2022), (Gibassier & Alcouffe, 2018), (Egan, 2019)].

The implementation of management accounting also helps companies in making unclear decisions in manufacturing companies. Companies involve stakeholders in helping companies in order to get more appropriate decisions regarding corporate sustainability issues [(Singh et al., 2018), (Kelsall, 2020), (Shen et al., 2020)]. In addition, the implementation of management accounting can provide positive relationships with stakeholders and pay more attention to employee welfare in decision making (Mahmood et al., 2021).

Through the use of management accounting, companies are able to provide appropriate strategies regards to the quality of the company's services and production processes. It is conducted to consider how the company is able to implement the right strategy regards to the possible impact on the company's sustainability and implement appropriate accountability. In addition, companies

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can manage legitimacy through social reporting in response to incidents in their supply chain (Cho et al., 2020).

CONCLUSION

Through a Systematic Literature Review (SLR), this study identifies a number of literatures which discuss the role of management accounting in company sustainability. From the result of the previous research, it shows that Environmental Management Accounting (EMA) is the approach most frequently used by companies which shows the importance of focusing on environmental management accounting practices in company sustainability. Furthermore, the implementation of management accounting plays a role in providing a clear picture of the impact of company operations on the environment; besides, it plays a role in helping companies in order to implement strategies to overcome the identified impacts.

SUGGESTION

Therefore, with information regarding approaches to management accounting and the role of management accounting in helping companies achieve sustainability, this article provides a good understanding of sustainability issues in the context of management accounting in manufacturing companies. Furthermore, legitimacy theory is the basis which strengthens the relationship between management accounting and company sustainability. By maintaining and enhancing legitimacy, companies can minimize the risk of losing public support; besides, can create a sustainable competitive advantage. In addition, by using a variety of management accounting approaches, companies can more effectively integrate sustainability principles into their business decisions which in the end it will support the achievement of overall sustainability goals.

LIMITATION

Limitations to this study can be identified from the lack of data availability. Although the article provides in-depth insight into sustainability issues in the context of management accounting of manufacturing companies, the limited data available in the watase may limit the broader generalization of the findings. Thus, it means that this study may not include the variations in practices that occur in the manufacturing sector as a whole. Therefore, for further research, it is recommended to expand the scope of research time and analyze deeper into management accounting practices in other sectors. Thus, further research can make a greater contribution to the understanding of the role of management accounting in order to support sustainability in various industrial sectors so that it can provide a more comprehensive and representative description.

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