Research Horizon

ISSN: 2808-0696 (p), 2807-9531 (e)

Research Horizon
Volume: 04
Issue: 05
Year: 2024
Page: 139-152

Transformation of the Green Accounting 4.0 Era towards Society 5.0: A Literature Study

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Abstract

While the study of the use of smart robots in production known as the Industrial Revolution 4.0 continues rapidly and competition in the right proportion with this and businesses that do not want to be left behind must follow suit. The purpose of this study is to review the transformation of green accounting from Industry 4.0 to Society 5.0. Misinformation from one of the business departments will affect the entire system, especially in the accounting department that records the financial movements of the business and reports the results effectively in making decisions that affect the entire business based on these results. The use of intelligent systems helps reduce human errors and the system acts faster while the system used in traditional accounting is abandoned. The study was conducted through a literature review of several journals so that the practice of green accounting towards changes to the era of society 5.0 can be known. The expected results of this literature review are that with the transformation will make the accounting and auditing professions work smartly using updated technology, the need for brain power to analyze system output will increase. In this context, especially those who practice the accounting profession must always renew themselves. The contribution of this study is to develop the concept of green accounting which is still often overlooked in Indonesia.

Keywords

Transformation, Green Accounting, Industry 4.0 Era, Society 5.0

1. Introduction

The study of the use of smart robots in production known as the Industrial Revolution 4.0 continues rapidly, so the competition is getting tighter. The right proportion with this and businesses that do not want to be left behind must follow developments in industry 4.0 and adapt. This study examines the industrial revolution 4.0 and its impact on accounting. Misinformation or incorrect information from one of the business departments affects the entire system, especially in the accounting department, which records the financial movements of the business and reports the results, and makes effective decisions that affect the entire business based on these results, the use of intelligent systems helps reduce human errors and systems to act faster so that the systems used in traditional accounting are abandoned (Rini, 2019). In this context, accounting in particular must constantly renew itself so that unstable reporting will not occur. Unstable company reporting emerged as an impact of the concept of measuring money, which states that accounting only reports economic transactions that have monetary value.

Thus, financial reporting is primarily concerned with transactions with economic substance. In addition, it is argued that the current form of financial reporting primarily serves the interests of shareholders, investors, and other users who have a direct financial interest (Modell, 2014). While the interests of the general public and civil society have received little attention (Sief, 2014). Research confirms that annual reporting includes financial and non-financial data, which consists of dozens of inputs from non-financial experts. This has given rise to a new global reporting standard, namely green (environmental) accounting or reporting. Environmental accounting and reporting are increasingly proving to be important to businesses because the influence of a company's social and environmental performance on its financial strength is increasingly being considered by investors, governments, creditors, and the wider community (Michelon, 2012). Therefore, trying to assess the environmental impact of corporate policies is essential.

Green Accounting is seen as an important tool to gain an understanding of the role of business firms in the economy towards environmental security and the welfare of citizens. Green Accounting also provides data, highlighting the contribution of business firms to economic welfare, the costs incurred in the form of pollution or resource degradation and the contribution to society. There is a fact that State-Owned and Private Enterprises are the main contributors to economic growth in Indonesia. This shows that the role of corporations in environmental degradation is also relatively high. As a result, Andon et al. (2015) explained that lately there is a growing trend among corporate stakeholders to know the impact of business operations on society and the environment as a whole. Civil society continues to demand businesses due to the current state of environmental degradation and embrace environmental and social goals in addition to increasing shareholder wealth.

Consequently, we can speculate that more companies in Indonesia will use integrated reporting. The previous discussion shows that environmental accounting practices have been growing worldwide in recent times, however, the available literature on environmental accounting such as identifying that environmental reporting is still very low (Sief, 2014; Modell, 2014; Horvat & Korošec, 2015; Goswami, 2014). It is also acknowledged that the information is scattered, scanty and disclosed throughout the annual report, not in a specific section. As corporate governance practices evolve, biased, unequal and one-sided reporting, such as financial reporting, is no longer seen as the only source of information on corporate performance and accountability. Therefore, it is

important for companies to disclose in equal measure for environmental information whose purpose is to describe the company's overall journey, how it creates value, its strategy, risks, threats and opportunities of its business model and also measure performance against strategic objectives.

The motivation for this study arose from the recognition that most studies on green reporting have been conducted in developed countries and only a few studies have been conducted in developing countries such as Mauritius, Bangladesh, South Africa, India, Malaysia and Indonesia. Euphoria 4.0 developed as a response to the Japanese government popularizing the idea called society 5.0, namely a human-centred and technology-based society. The technology discussed here is the technology that developed in the Fourth Revolution when data is interconnected and uses artificial intelligence. The concept of 5.0 gave rise to the wrong idea that the number 5 here is a continuation of what is in the Fourth Revolution. Society 5.0 utilizes technology that has developed to address problems that have arisen (in part) due to the Fourth Revolution, namely the alienation of social relations, the digital divide resulting in socio-economic inequality, the use of fragmented technology within the framework of togetherness and prosperity (Prasetyo, 2019).

2. Literature Review

The first industrial revolution was marked by the development of the steam engine as a production power in England in the 18th century (Tekin & Karakus, 2018). The use of oil and electricity in production activities marked the transition from the first industrial revolution to the second industrial revolution towards the end of the nineteenth century which was identical to mass production (Esmer & Alan, 2019). This period is known as the Second Industrial Revolution, which was towards the end of the nineteenth century and was identified with mass production (Esmer & Alan, 2019). The production line design used by Henry Ford, the pioneer of the serial production system, has become an example for many sectors and has begun to be implemented. Therefore, the second industrial revolution is generally known as Fordism (Gabaçli & Uzunöz, 2017).

After this trend, the transition to a digital system occurred and the third industrial revolution, the era of digitalization in production, has begun. With digitalization, the phenomenon of globalization becomes important and rapid information transfer becomes possible. The need for labor is decreasing, and the number of machines programmed for various production processes is increasing rapidly. The rapid development and integration of computer hardware, software, networks, and digital technologies, which are the determinants of the industrial revolution, are changing society and the economy. A new era in which cyber-physical systems, dynamic data processing, and value chains are interconnected with each other is emerging due to the proliferation of information technology and automation. While the demands and changes in the needs of industry and consumers continue to increase and new searches continue, the concept of Industry 4.0 has finally emerged. This concept was first mentioned in Germany in 2011 (Derya, 2018).

Industry 4.0 is a strategic effort by the Indonesian Government to continue industrial growth. Industry 4.0, where economic power is brought into the digital environment, draws its power from new technologies such as cloud computing, project analysis, machine learning, robotics, Artificial Intelligence (AI), Distributed Ledger Technology, and mass data processing (Antoney & Augusthy, 2019). With the technological breakthroughs developed with Industry 4.0, while large companies calculate the size of the cut they will receive from the global economy, smaller national companies can focus on developing their competitiveness to become international players. Industry 4.0, which means smart machines for production and service processes, also creates value thanks to the chain of smart

robots created along the production line. The impact of Industry 4.0 will undoubtedly be enormous considering the development of the global economy. The emergence of Industry 4.0 has a major effect on the global economy and affects businesses that shift consumer preferences, improve asset quality by increasing data output, form new relationships as learning about the value of new ways to collaborate, digital transformation in operations. models into new business models, especially open web-based platforms generate new opportunities and increase competition (Vaio & Varriale, 2019).

The concept of Industry 4.0 can be called a smart factory. This smart factory has a decentralized communication network thanks to smart robots that are effective throughout the production and service process. With this network that requires advanced technology and big data management, robots can interact with each other and humans in real time (Morrar et al., 2017). Industry 4.0 is an intelligent and interactive concept that continues to change and develop rather than a closed system and must be defined as the foundation of a larger structure. This structure will be a structure that goes far beyond the factory and will be a system that works like a single body. Thanks to its advanced technology, it can connect the main sectors in the world coupled with the technology of the internet of things and services, interconnected systems in the factory can be connected to higher structures and eventually to the whole world. Thus, various integrities emerge from energy to health, from logistics services to the construction industry. Many systems such as smart buildings and residential areas, sustainable and sustainable energy, faster logistics services and mobility (Bartodziej, 2017).

Industry 4.0 requires innovation and change in all areas of life. What individuals need to have to keep up with these changes can be listed as personal and social competencies. Cognitive abilities and the ability to develop value mechanisms are two types of personal competencies that individuals must have in order to keep up with technological advances in Industry 4.0. Currently, with increasing digitalization, the way we work is changing. Developments such as the internet of things, smart factories, digital systems and robotics in automation are gradually reducing the role of humans in business life. As social beings, we tend to establish relationships with other individuals in society and business life. Personal skills shape individuals in terms of establishing relationships with other individuals. In a social environment, individual communication skills become important and therefore trigger individuals to develop social mechanisms such as teamwork, communication with other individuals and group activities (Wardini, 2018). Industrial policy decisions that serve business needs appropriately and in accordance with research and development activities must be made for Industry 4.0 applications. According to Demirkan & Arslan (2019), it is recommended that policies set with this target should be within the scope of the following articles, such as standardization and reference architecture, complex system management, comprehensive broadband infrastructure for industry, occupational safety and health (OHS), work organization and design, continuing professional education and development, regulatory framework, and resource efficiency.

The development of technology and the integration of Industry 4.0 have brought significant changes to companies' financial and non-financial reporting. This reporting, which is generated through data recording and analysis, has become faster and more complex as technology advances. Company managers, especially those in charge of financial affairs, must prepare themselves with new tools and skills to adapt to changing business methods. Traditional accounting approaches are forced to change, especially with the reduction of labor associated with the automation of accounting transactions and the use of communication between objects. The data generated and recorded in this process creates a large database that is a source of important information for businesses. Accessing

relevant information and converting it into useful insights requires specialized skills. This is even more crucial because the information must be delivered in a timely and relevant manner to users of the information. To face this challenge, accounting engineers are needed who are able to design and manage modern technology-based systems. These engineers will play an important role in ensuring that technology can be used optimally to support reporting and decision-making in the company (Yardımcıoğlu et al., 2019).

Accountants are always involved in the financial management of a company. Important activities for the company such as processing and preparing financial report data are included in the accountant's expertise. Short-term and long-term financial strategies are prepared by accountants. Therefore, all accountants, whether under company management or not, must expand their areas of expertise and follow new developments. If not for the developing technology, financial reports would be made by supercomputers and they would lay off accountants. Thanks to information technology, accounting and auditing can be done much more comprehensively and quickly. Accounting and auditing which are developing day by day will be replaced by computer systems in the future, just like the profession where robots replace humans. Although this situation still contains a lot of uncertainty, it is undeniable that the situation will not be the same as before. On the other hand, Industry 4.0 which will experience major changes will create many new opportunities and only those who want to develop themselves can take advantage of these opportunities. In today's reality, information technology is essential for competition and development and is a must for companies to survive (Kruskopf et al., 2019).

Industry 4.0 is an era in which management and control systems are integrated digitally, reducing the role of human intervention. In this transformation, the associated risks come more from the digital world, so security becomes a crucial element. Accountants in this era are required to have relevant skills, such as the ability to conduct risk analysis to identify and solve security problems. With these skills, accountants will become professionals who are able to support companies in various strategic aspects. They are not only able to set long-term goals for the company, but also provide advice on technology investment and return on investment (ROI) analysis. In addition, accountants can help increase productivity in the production process, as well as play an important role in setting pricing policies and contracts that are profitable for the company. All of this shows that accountants in the Industry 4.0 era have greater responsibilities and a more strategic role in the management and growth of companies in the future (Chen, 2019).

The operational performance of an organization can be determined with the help of certain processes such as documentation and reporting of greenhouse gas emissions. However, conventional accounting systems are determined not to consider new or existing demand for natural resources. This demand for natural resources can destabilize the sustainability of economic performance and growth, depletion of natural capital, environmental degradation as a social cost of economic activities and also accounting for non-market goods in GDP. Considering the growing population and limited availability of natural resources, the issue of environmental protection is raised as one of the most important issues of human society today. The knowledge of environmental economics or green accounting is actually a science that helps to develop sustainable use of natural resources. Environmental knowledge explores how to manage and develop environmental resources. This science tries to help humans achieve Sustainable Development (SD) and environmental considerations in advancing technological and socio-economic development.

The goal of environmental economists is to better understand the relationship between economic activities and nature and to make us more aware of environmental issues. The basic point in this science is that economics and environment are not separate from each other, there is no economic decision that does not impact the environment and no environmental change that does not have an economic impact. Environmental economists try to reconcile environmental protection and economic activity with the help of economic tools and theories. Therefore, environmental protection issues require an environmental management system that is integrated with other management systems. An environmental management system is a tool that enables organizations to achieve the required level of environmental performance and to control it systematically. Accounting information systems, as an integral part of management information systems, can play an important role in helping to protect the environment from pollution by manufacturing companies (Serafy, 1997).

Green Accounting is a system for creating costs and obtaining environmental benefits (Maama & Appiah, 2019). It provides information that helps managers in evaluating, operating, controlling, deciding, reporting, and protecting the environment. At the beginning of the emergence of accounting issues, environmental companies did not want to disclose environmental damage in their financial statements, but companies were forced to comply with the issue due to the lapse of time and increasing damage. Recognizing the environmental costs associated with a company or organization's products is essential for good management decision making. The use of environmental accounting in issues such as costing, investment analysis, and strategic management decisions has increased. Until now, many companies are facing environmental problems and are looking for the right way to report and disclose information to the general public and use this information to develop and protect the environment. The use of environmental accounting is an effort to protect the environment.

Conventional national income accounting has limitations in accounting for environmental impacts, especially related to pollution prevention expenditures. Green accounting presents a more comprehensive solution by considering the costs of preventing pollution and conducting environmental impact studies. In addition, conventional national income accounting does not measure natural resource depletion and environmental degradation, two important factors that affect long-term welfare. Green accounting complements this by including the costs of natural resource depletion and changes in environmental quality into the calculation. There are also several types of resource expenditures that are not fully recorded in conventional national income accounting systems, such as the consumption of environmental goods, for example exhaustible resources, and the use of conflicting environmental services. For example, the atmosphere is used by producers as a production input, but also by households as consumption good. Green accounting expands the scope of conventional accounting by assigning more accurate costs to the use and depletion of natural resources, both in the production process and for final demand. In addition, green accounting also considers changes in environmental quality due to pollution and other impacts arising from production activities, consumption, and natural events. Thus, green accounting offers a more holistic approach to understanding economic costs related to the environment.

Green accounting has been widely applied in developed and developing countries. Green accounting tries to campaign for corporate, employee, community, and government relations to simultaneously address the impacts of environmental pollution so that benefits arise to protect it. The issue of environmental accounting development focuses on environmental management accounting or financial accounting, the most prominent benefits come from the application of environmental management accounting methods. This type of accounting focuses

on collecting, estimating, and analyzing costs associated with the use of energy and physical materials such as wood, metal, or coal. Standard accounting practices tend to place these costs in all overhead categories, but environmental management accounting allows accountants to apply activity-based costing principles to more accurately attribute these costs to various projects or events (Rounaghi, 2019). Environmental accounting must also have environmental reporting on its side and this is important for users of environmental reporting to know environmental performance (users of information want to know what the company has achieved in relation to its relationship with the environment and society) and disclosure of information about environmental costs to increase (maximize) shareholder wealth which leads to increased company value. So in the end, environmental (green) reporting will lead to increased corporate value, maximize shareholder wealth, sustainable corporate growth and so on (Rounaghi, 2019). One of the developed countries that implements green accounting is Japan from 2000 to the present which is increasingly refined.

In 2005, the International Federation of Accountants (IFAC) introduced the Environmental Management Accounting Guidelines. These guidelines emphasize the importance of implementing an appropriate environmental accounting system to manage economic performance as the basis for financial management accounting. In it, life cycle accounting, total cost accounting, effective processes, and environmental management planning become integral parts of environmental management accounting reports and audits. Furthermore, the Ministry of the Environment of Japan in 2000 released the Environmental Accounting Guidelines which underlined the importance of corporate effectiveness in environmental protection activities and quantitative assessment of costs as part of green accounting. Every company is required to have systematic records and reports in order to maintain a good relationship with the ecological environment. The implementation of these guidelines aims to achieve sustainable development. In Taiwan, the Environmental Protection Administration in 2008 issued the Industrial Environmental Accounting Guidelines. These guidelines encourage companies to invest in environmental improvement and protection through measurement, recording, analysis, and consistency in restructuring corporate activities. The results of these activities are communicated to stakeholders to ensure transparency and responsibility in environmental management. These three guidelines demonstrate a global commitment to the implementation of environmental accounting.

The implementation of green accounting in Indonesia has been carried out in accordance with the rules and concepts that have been determined in various regulations (Kusumaningtias, 2013). One important regulation is Law No. 23 of 1997 concerning Environmental Management, which requires every citizen to protect and manage the environment, and to convey correct and reliable information. Furthermore, Law No. 25 of 2007 concerning Investment regulates the obligations of investors, both individuals and business entities, to carry out corporate social responsibility by preserving the environment and respecting the cultural traditions of the surrounding community. In addition, Law No. 40 of 2007 concerning Limited Liability Companies requires companies that use natural resources to calculate their social and environmental responsibilities fairly. In the banking sector, Bank Indonesia Regulation No. 7/2/PBI/2005 stipulates that every credit given by a bank must consider environmental management by the debtor company (green credit). Finally, Decree of the Chairman of the Capital Market and Financial Institution Supervisory Agency No. KEP-134/BL/2006 requires companies to report environmental conservation activities and related costs in their annual reports.

3. Methods

This study uses a qualitative research method that focuses on the concept and implementation of green accounting in Indonesia, which is reviewed through various related studies. Green accounting, or environmental accounting, is important in the context of Indonesia which is currently experiencing digitalization and preparing to face future challenges, especially in business competition. The literature review explains in detail why the implementation of green accounting should be a priority, especially as the pressure to maintain environmental sustainability and social responsibility is increasing. This study also touches on the transformation of green accounting towards version 4.0, which is a combination of digital technology and environmental accounting practices. This is relevant considering that the digital era brings major changes in the way companies operate, as well as the need to be more integrated and responsive to environmental issues. In this process, the transformation of green accounting is directed to adapt to Society 5.0, a vision of a future society where advanced technologies such as Artificial Intelligence (AI) and the Internet of Things (IoT) support human life without ignoring aspects of sustainability. The practical and tactical parts of this study will discuss how the implementation of green accounting can be applied in real practice in Indonesia, based on the experience and findings of previous studies. Thus, this study offers a strategic perspective on how green accounting can support business sustainability in the modern era.

4. Results and Discussion

Corporate sustainability as the latest corporate goal requires companies to have a sustainability strategy and type of accounting information that can meet new requirements and help corporate management make decisions for the benefit of corporate sustainability within a responsible framework. In other words, the accounting process as a business language and source of information must meet sustainability requirements. One of the most important accounting principles is the going concern principle, which states that the preparation of corporate reports and corporate accounts must start from the principle that the business actor will also be able to maintain its operations in the future and that the cessation of business or a significant reduction in operations for any reason is not expected (Accounting Law, 2000). This means that the company does not intend to stop or drastically reduce its business activities. If the principle of continuity is not achieved, then some basic accounting principles cannot be realized. For this reason, great attention must be paid, because it is the basis of accounting regulations. Accounting principles are concerned with creating conditions for economic operations, and traditional accounting understands economic organizations as closed systems that exist independently of their social and natural environment (Wolk et al., 2016). In contrast, corporate sustainability states that a company can only achieve long-term profitability if it does not ignore its impact on society and the environment and the impact of society and the environment on the company.

In the author's view, the principle of corporate sustainability can be modified in relation to sustainable development. In other words, companies must reform their activities in such a way that long-term operations are not only manifested in economic performance but in addition to economic (financial) considerations, companies, taking into account social and economic factors, ensure that their impact on society and the environment also allows them to operate in the long term. Of course, this change will affect all the basic principles of accounting. Thus, the basic task of accounting is to provide reliable and correct information about the operations of economic organizations in their reports for affected interest groups and market players. The information contained in the financial statements can

serve current and potential investors, creditors and other individuals and organizations so that they can evaluate the investment performance and value of the company in the future. Companies often understand this as corporate sustainability and show it in corporate reports by ignoring social and environmental considerations.

The name and concept of environmental accounting first appeared in specialist literature about a decade ago. According to Schaltegger & Burritt (2000), Environmental accounting is a branch of accounting that deals with the activities, methods and systems; recording, analysing and reporting; and financial impacts caused by the environment and the ecological impacts of a given economic system. Environmental accounting is a part of the development of accounting in which non-monetary, physical and quality factors have received great emphasis. Environmental (green) accounting consists of two sub-systems, one of which (environmental accounting) deals with the financial effects caused by environmental protection, namely environmental expenditures and savings, and the other (ecological accounting) deals with the environmental impacts of a company's economic activities, namely calculating the extent to which the natural environment is changed as a result of the company's operations and activities (Raju, 2018). The environmental accounting subsystem is in the focus of environmental management accounting is the collection and analysis of pieces of information derived from environmental costs and other costs and the preparation of internal analysis and support for rational decision-making by management (Csutora & Kerekes, 2004). Internal ecological accounting focuses on analyzing changes that occur in nature due to a company's activities. Environmental financial accounting prepares reports for external stakeholders about the company's environmental obligations and expenses that impact the company's financial position. External ecological accounting, similar to internal ecological accounting, considers environmental impacts and prepares reports from this data.

The principle of green accounting, according to Schaltegger & Burritt (2000), represents the peak of current accounting or, in other words, known as sustainability accounting. Sustainability accounting goes beyond the two types mentioned previously by examining all three dimensions as well as the company's operations and, most importantly, emphasizing the interaction between them to produce a heuristic multidimensional approach to corporate sustainability. Based on the changes in the last few decades, it is clear that traditional accounting cannot offer enough relevant information to stakeholders about the creation of corporate sustainability. Therefore, it needs to be reformulated and expanded. Given that this is a new area in the development process and there is no widely accepted approach. Green accounting, in the sense of the TBL term from Henriques & Richardson (2004), is a tool that influences corporate activities on the social community and the natural environment, which can be given in the form of numbers or, in other words, sustainability is expressed in financial terms. What causes the difference in the use of this concept? We just need to think back to the narrower and broader definitions of sustainability, where the former only covers environmental sustainability, while the latter covers full sustainability or three dimensions. According to the authors, this could be one of the reasons why the term is not clearly understood. Another reason is the different concepts of corporate sustainability.

Green accounting is a branch of accounting that focuses on recording, analysing, and reporting environmental and social impacts generated by economic activities. Green accounting covers three main aspects: first, the financial impact caused by the environment and society; second, the ecological and social impacts of a particular economic system, be it a company, production location, or country; and third, the interaction and interrelationship between social, environmental, and

economic issues. In its implementation, transactions in green accounting can be classified into several cost categories. Pollution control costs, for example, are costs allocated to reduce air and water pollution through various control facilities. Furthermore, environmental protection costs include expenses that focus on energy savings to reduce the impact of global warming. Resource recycling costs are directed at waste control measures and rainwater management, aiming to optimize the use of resources efficiently.

In addition, there are environmental restoration costs that include efforts to restore land and water pollution, as well as environmental compensation. Environmental protection management also requires costs for promotion and certification, such as ISO 14001, while social activity costs reflect participation in environmental conservation. Finally, Research and Development (R&D) costs are allocated to activities that support environmentally friendly design and products, such as innovations in more sustainable packaging. Green accounting needs to be addressed as a completely new and independent accounting system or it should be part of traditional accounting (financial accounting and management accounting). According to Schaltegger & Burritt (2000), the first option is preferable, as it would offer the possibility to build relevant economic, social and environmental benefits and risks, and the interactions between these dimensions, into the company's accounting system. However, in practice the authors believe that the second option is more realistic; gradual modification and expansion of existing accounting systems constitute a less drastic transformation for company management.

The differences between traditional accounting, environmental accounting, and green or sustainability accounting lie in their respective scopes, perspectives, tasks, information elements, tools, methodologies, units, regulations, and characteristics. Traditional accounting focuses on the economic and financial aspects of a company, with the main task of providing an overview of the economic situation and cost management. In terms of information elements, this accounting includes financial and management accounting, as well as financial statements and other internal reports. Its methodology uses valuation procedures and cost accounting, with financial units excluding inventory and subject to legal regulations related to financial accounting. The characteristics of traditional accounting are mandatory. Meanwhile, environmental accounting highlights the relationship between the economy and the environment. Its task is to evaluate environmental performance, with information that includes environmental financial accounting and environmental reports. The methodology used involves environmental performance evaluation and sustainability balanced scorecard. Environmental accounting is not mandatory, although there are legal regulations that require reporting of some elements of environmental performance. On the other hand, green accounting seeks to integrate the economy, society, and the environment. Its task is to provide an overview of sustainability performance. Its information elements include sustainability financial accounting and sustainability management accounting. Green accounting uses sustainability reports and analyses the life cycle and environmental cost savings. Its characteristics are mandatory, supported by various regulations such as Law No. 40 of 2007 and PP No. 47 of 2012.

Many accounting systems are considered as managerial acts of thought, but the gap between analysis and execution by managers is being eliminated in companies faced with the opportunities of society 5.0 and the creation of compatible performance management systems becomes a necessity. Accountants' understanding of performance metrics, management assessment parameters, and incentives must be used in designing new responsibility and reward structures in companies. Through crises and stability, companies have looked to the finance function in an effort to maintain an efficient and effective operating model through

the provision of financial information to guide control decisions. Much of the accounting information provision agenda in relation to the shift to the Society 5.0 era and the challenges and trends of 'information literacy' that have been discussed in several organizational contexts will undergo a transformation. Understanding the key role of data integrity during the collection and processing stages, designing work based on a more sophisticated understanding of knowledge, enabling increased deployment of emerging technologies for data capture and analysis, and adopting a more nuanced analysis of the control-strategy link, the complexity of cost management and cloud-based possibilities, will prove to be of increasing concern to accounting information providers.

Changes in information technology inevitably change the collection and analysis of information for management and control activities. There is an inherent change in the role of financial information providers given the widespread diffusion of information in combination with new forms of IT for its collection and analysis. Note that the activities of financial functions such as accounting, compliance, management and control, strategy and risk, financing and resources face current challenges and tensions across organizational settings. They argue that the relentless development of IT may have a transformative impact on the implementation of financial activities and also present on-going challenges. The focus of green accounting in control must align the functions of technology and the environment. The concept of Society 5.0 is a continuation of the process of Society 1.0 - 4.0. Society 1.0 is the era where humans do hunting, gathering, and know how to write. Society 2.0 is the era of farming in the agricultural industry. Society 3.0 is the era of the introduction of industry and the tools used. Society 4.0 is the beginning of human work assisted by computerization in the process of extracting and disseminating information data. The 5.0 era has shifted accounting practices to be more modern and well-computerized so as to help the performance of the accounting profession. Through green accounting activities, environmentally oriented financial management has aligned technology and tasks that have resulted in a reduction in the accounting profession because the equipment used is increasingly sophisticated and skilled. The environmental management process in the concept of green accounting has helped monitor risk control over the environment used by many companies. The target of achieving and implementing green accounting in the Society 5.0 era is optimizing technology in environmentally oriented financial recording.

Enterprise Resource Planning (ERP) is an information system that can integrate, monitor, and record every process and transaction in a company. This is related to the implementation of environmental quality management and green standards in Indonesia. The ERP system in green accounting, if developed according to user needs, needs to be tested using Software Requirements Specifications to determine whether the proposed system works well or not. By implementing the concept of environmental accounting, companies can be more easily accepted by the community and companies can generate more profits in the future. System requirements in making environmental cost reporting have been successfully added according to user needs, so that they can account for all social and environmental activities through environmental cost reports. The application has been successfully integrated to record transactions, and recording of purchase transactions made by the purchasing department can be accepted and validated directly by the accounting department. Big Data is revolutionizing many areas, allowing companies to gain greater insight and actionable intelligence for their business, but also the corporate sector has realized its value, understanding that data is critical to decision making and its accountability. The penetration of mobile phone use, sensors, satellite data along with new technologies and the democratization of data analytics with open source and open data environments is

helping to adopt this technique in development initiatives, international and national organizations. The use of green fields or new fields with little related academic literature simultaneously finds the terms Big Data and accounting alongside the concepts of international development and SDGs. In the case of the SDGs where Big Data is directly applied is a suitable field for its application due to the nature of its own goals and targets. In addition, this field is currently led by international organizations such as the UN, WHO, and the World Bank who are seeking to incorporate Big Data as a primary tool.

In relation to the relationship between strategy, structure and green accounting, researchers have emphasized that recognizing the value of 'Big Data' and developing the ability to apply data analysis techniques for many companies is an important pathway that allows executives to act on empirical information, both structured and unstructured, in developing market and strategic intelligence with an eye to competitive and customer behaviour trends. In such a context, there is little sequential linearity between strategy-structure and information system design. In changing cost structures, changes in product cost mix and shifts in cost behaviour will not require dispensation of long-established decision-making approaches, but rather a reassessment of how cost changes can be translated into updated alternative business strategies. Blockchain-based information management systems are a potential platform for storing and maintaining green accounting information. Effective validation techniques in blockchain and are an essential part of chain operations. Blockchain-based systems will prevent the tampering of green accounting information, as each block includes the hash of the previous block making it open and immutable. The quality and uniformity of data are maintained throughout the collection process using blockchain. In corporate management systems, blockchain will help accountants to refine and secure their financial data so that information regarding green accounting can be recorded and stored properly.

5. Conclusion

The implementation of green accounting in the Society 5.0 era requires thorough preparation to ensure optimal implementation. The initial stage involves projecting the positive and negative impacts of the use of advanced technology in sustainable financial recording so as not to disrupt the company's profitability and benefits. These benefits must include social, economic, and environmental aspects so that they can be felt by various parties, especially stakeholders. The role of accountants in the Society 5.0 era is also very crucial, because they need deeper insight to prevent errors or disinformation. The transformation of green accounting from the 4.0 era to Society 5.0 includes several important aspects. First, green accounting is part of management accounting that focuses on environmentally oriented financial transactions, such as the provision of green credit by banks. Second, the accounting function is not only limited to delivering financial information but must also be systematically integrated so that environmental responsibility reports are delivered accurately. Third, accounting management must be adjusted to the latest technological developments, which require accountants to be more careful in managing reports and controlling risks in an informative and open manner. This openness of information plays an important role in supporting environmental conservation activities, such as preventing forest damage, waste management, and assistance during natural disasters, and developing education through scholarships. Ultimately, we must be ready to face the changes from era 4.0 to 5.0 by increasing our ability to adapt to new technologies.

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