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Integrating sustainability into management control systems: literature review

L'intégration de soutenabilité dans les systèmes de contrôle de gestion : revue de littérature

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Abstract

The concepts of sustainability and management control are of interest to researchers in a separate capacity. The concept of sustainability has become a primary concern for governments, institutions, businesses and individuals alike. Concurrently, management control systems are experiencing substantial changes, both in theory and in practice. The factors of sustainable development and its sustainability objective are considered contingent upon the design of control systems. This growing interest and evolution in the field necessitate a comprehensive examination of the interrelationship between these two concepts, which can be achieved through a systematic analysis of the integration of sustainability into management control systems. There is an increasing integrative approach to management control systems.
This semi-systematic review is part of this debate and aims to analyse studies carried out and published in peer-reviewed journals indexed in well-known databases (Elsevier, Emerald, Springer, etc.). The review encompassed 46 articles, which were analysed by theme to identify theoretical relationships that could be utilised in future research. The results obtained demonstrate two key findings. Firstly, there is an upward trend in research in this field with a view to enriching the theory of environmental management control systems. Secondly, sustainability is integrated into the practices, strategy, processes and financial communication of companies to varying degrees through sustainable reporting and ESG. The present review makes two principal contributions. Firstly, it responds to a call for further literature reviews on this subject. Secondly, it offers a practical solution in the form of a structured overview of the results of several articles, which in turn provide new avenues for theoretical or empirical research.

Keywords: sustainability, management control systems, environmental control, integration.
JEL classification: Q56, M49
Paper Type: Theoretical Research

Résumé

La soutenabilité et le contrôle de gestion sont deux concepts qui suscitent l'intérêt des chercheurs séparément. La soutenabilité est une grande préoccupation pour les Etats, les institutions, les entreprises et les individus. Alors que les systèmes de contrôle de gestion connaissent de grandes évolutions, sur le plan théorique et pratique. Le développement durable et son objectif de soutenabilité sont des facteurs de contingence de la conception des systèmes de contrôle. Cet intérêt croissant et cette évolution rendent important de traiter l'interrelation entre les deux concepts, par l'analyse de l'intégration de la soutenabilité en système de contrôle de gestion. L'approche intégrative des systèmes de contrôle de gestion est de plus en plus observée.
Cette revue semi-systématique s'insère dans ce débat et vise à analyser les études réalisées et publiées en des journaux à comité de lecture et indexés en bases de données connues (Elsevier, Emerald, Springer,..). La revue a concerné 46 articles analysés par thèmes afin de dégager des relations théoriques exploitables en recherche. Les résultats obtenus montrent d'abord, une tendance haussière des recherches en ce domaine pour enrichir la théorie du système de contrôle de gestion environnementale ; ensuite, la soutenabilité est intégrée à des niveaux plus ou moins faibles aux pratiques, à la stratégie, aux processus et à la communication financière de l'entreprise via le reporting durable et l'ESG. Cette revue contribue d'abord par la réponse à une demande de plus de revues de littérature sur ce sujet ; et sa contribution la plus pratique est d'organiser les résultats de plusieurs articles et les articuler pour donner de nouvelles pistes de recherche théoriques ou empiriques.

Mots clés : Soutenabilité, système de contrôle de gestion, contrôle environnemental, Intégration.
JEL Classification : Q56, M49
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1. Introduction

The ecological constraint is just one of the many challenges organisations face today. Environmental degradation is a growing issue, with visible effects like climate change and resource scarcity. The 1987 Brundtland report made it clear: sustainable development is the only solution to these environmental problems. The report defines sustainable development, as "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*"[1]

Integrating this societal factor into organisational decision-making adds social and ecological objectives to economic performance objectives (Hopwood et al., 2010). Managerial practices are being adapted to meet the expectations of the various stakeholders. The theory of practices clearly demonstrates that humans, and consequently organisations, seek to adapt to change by adopting new routines in order to ensure stability. Faced with changes in the environment relating to sustainable development, we are seeing the emergence of a number of practices and tools grouped together under the concept of sustainability.

The concept of sustainability has evolved significantly since the publication of the Brundtland Report in 1987 and its subsequent adoption at various United Nations conferences. In research, sustainability refers to the need to incorporate social and environmental considerations into decision-making processes alongside financial controls. This approach ensures that an organisation's economic objectives are met while also aligning with societal and environmental goals (Lankoski, 2016). Sustainability is based on values centred on the knowledge of desirable behaviour (Rokeach, 1973), and addresses environmental and social concerns as well as economic ones, such as pollution prevention, waste management, clean technology, reduction of ecological impact, etc. (Corsi & Arru, 2021). Sustainability, as a multidimensional concept, has undergone a major evolution. It is a 'frontier term' that links several areas of politics, economics, innovation and the environmental protection network. It gives rise to ongoing debates that are a source of new ideas for application (Scoones, 2007). In some cases, this multi-domain membership has limited the actual implementation of sustainability to mere rhetoric (Giovanni & Fabietti, 2013).

The integration of sustainability into management and strategy is not merely a rhetorical exercise; it necessitates the utilisation of tools and practices that are capable of controlling the decision-making process by incorporating sustainability aspects. These management tools represent various innovations in management control, a field that is undergoing significant dynamic change in response to current constraints, including digitalisation and ecological concerns. Innovations in management control represent new or modern forms of management control (Zawawi & Hoque, 2021), since taking account of environmental issues such as climate change and the scarcity of resources is changing the mission of management control. The integration of these novel constraining situations has given rise to an innovative form of management control that incorporates social and environmental parameters. This is known as environmental management control and, more recently, sustainability control systems.

The integration of sustainable development into management control can be defined as the process of accounting for negative externalities and market failures (Gray & Stites, 2013). Secondly, environmental management control constitutes a management innovation that aims to integrate social and environmental aspects into strategic and operational decisions. Finally, environmental management control refers to sustainable development, encouraging the introduction of steering indicators relating to sustainable growth. In their study, Charriot and Vidal (2020) observe that social and environmental accounting *"lacks practical value in*

[1] *Brundtland, G.H. (1987). Our Common Future: Report of the World Commission on Environment and Development. Geneva, UN-Document*

operational management focused on cash flow monitoring". It is evident from the experimental evidence that social and environmental accounting has the capacity to influence attitudes, yet it is not sufficient in itself to engender change in practices (Charriot & Vidal, 2020).

In his literature review, Antheaume (2013) references the concept proposed by Henri and Journeault (2010), which posits that the implementation of conventional strategic and financial control mechanisms within the domain of environmental management, under the rubric of *'eco-control*', does not result in any alteration to economic performance. Instead, it serves to establish a mediating linkage between the two, thereby facilitating a more integrated approach (Antheaume, 2013). The successful implementation of novel practices and performance management tools is contingent upon their alignment with the organisation's vision. Failure to ensure compatibility between these practices and the company's strategic direction risks perpetuating a discourse on environmental performance, with no tangible impact on the market and society.

A number of studies have focused on the study of sustainability in management control as a tool, such as the Sustainability Balanced Scorecard (SBSC) (De Villiers et al., 2016), and others on a set of sustainability control tools in the form of a '*package*'. Conversely, the multiplication of speeches and reports on sustainability, social responsibility and sustainable development has led to accusations of 'green washing' against companies. Confronted with contentious empirical findings, the authors, in their recommendations for future research, advocate for further investigation into sustainability and the management control system. Indeed, the theory of the management control system of sustainability is in its infancy and requires several scientific contributions, including a literature review of previous works. This contribution is facilitated by way of the extant literature review, in which the findings of earlier studies are analysed and organised. The question it seeks to address is how sustainability is integrated into management control systems.

In order to respond to the aforementioned query, the present study has been structured as follows: firstly, a comprehensive literature review of the fundamental concepts has been conducted (see Section 2). Secondly, the methodology employed for this review has been outlined (see Section 3). Thirdly, the results obtained from this review have been presented in a descriptive manner (see Section 4.1) and analytically (see Section 4.2); and finally, the study has been concluded with a discussion of its contributions and potential avenues for further research.

2. Literature review

Recent years have been characterised by significant international and global events, including climate change (with its attendant consequences for water management and food sovereignty, among other issues), and the exacerbation of poverty and social inequalities. This situation gives rise to intense environmental concerns and social tensions (Giovanni & Fabietti, 2013). The management of these tensions necessitates the implementation of a management control system within a framework of sustainability.

2.1 Sustainability

The concept of sustainability is multidimensional. As mentioned in the introduction, treating each dimension separately makes sustainability appear to be mere rhetoric. The aim of this paragraph is to explore the notion of sustainability through definitions, the evolution of its dimensions and approaches to its meaning.

A key challenge in implementing sustainability is the lack of clarity around its definition (Giovanni & Fabietti, 2013). The notion of sustainability has undergone a gradual evolution in response to a variety of political and intellectual reflections. This evolution can be identified through three discourses, Firstly, the environmental discourse: since the 1972 United Nations

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Conference in Stockholm, sustainability has been strongly linked to nature and the environment. International institutions have played a pivotal role in shaping sustainability discourse, promoting environmental protection and the planet's capacity to regenerate natural resources and safeguard our future. Secondly, social issues predominate in the discourse on sustainability, with the emphasis on current and future generations, discrimination, racism and social equity. In corporate contexts, this social discourse has been associated with the concept of social responsibility.

Sustainability is also defined as the capacity of an organisation to endure over time, with regard to portability, productivity and acquired performance, as well as the management of environmental and social assets that constitute its capital (Doane & MacGillivray, 2001). Conversely, the second side encompasses the act of listening to and acknowledging the demands and complaints of direct and indirect, current and future stakeholders. These demands are then incorporated into objectives to be achieved. In this regard, companies face a dual challenge: the imperative for innovation and performance on the one hand, and the obligation to address the degradation of natural resources and social equity on the other. The integrated approach to sustainability has been identified as a means to address the tensions arising from this dual challenge. Practitioners and academics have recently been placing greater emphasis on management systems, practices and processes that facilitate the integration of social and environmental concerns with economic, financial and commercial requirements (Giovanni & Fabietti, 2013).

From a sociological perspective, and in response to pressure from national and international institutions, practitioners and academics, companies are increasingly obliged to integrate social and environmental aspects into their strategies, structures and management systems. Failure to do so may result in the integration process being perceived as mere rhetoric, and may compromise the legitimacy of certain practices. The solution to this issue, therefore, is to adopt an integrative approach that encompasses the financial, social and environmental dimensions. We are then confronted with the concept of 'integrated sustainability', which is facilitated by ad hoc governance structures, business models, management systems, measurement and reporting systems. These systems could be designed in a targeted manner according to an integrated approach.

It is evident that companies have been compelled to incorporate environmental performance metrics as a component of the indicators employed to guide corporate performance, in response to mounting institutional pressures. For instance, the objective of eco-innovation has been incorporated into the strategy. As demonstrated in the extant literature, García-Granero et al. (2018) have identified thirty performance indicators, which they have classified into four types of innovation: product, process, organisation and marketing.

In conclusion, it is important to note the replacement of the terms *'sustainable development'*, '*sustainability*' and *'corporate social responsibility'* with the term 'sustainability'. The concept of sustainability encompasses the economic, social and environmental dimensions. In this literature review, the business and management perspective will be prioritised. The integrative vision of sustainability encourages companies to measure and manage the overall performance of the company, including financial and non-financial aspects. The concept of management control is linked inextricably to the broader issue of sustainability.

2.2 Management control

Management control (MC) is a nascent discipline that originated in the field of accounting and subsequently expanded to encompass all corporate control systems, thereby responding to the evolving demands of corporate governance. The initial definition, which established the theory of the management control system, is that of Anthony (1965). Control can be defined as the mechanisms employed to ensure that predefined rules and objectives are achieved and complied

with it. Subsequent to the establishment of Anthony's 1965 theory of management control, the preceding two decades have witnessed a substantial implementation of this theory across diverse disciplines (Bin-Nashwan et al., 2017).
Simons (1995) defines the Management Control System (MCS) as a set of formal, information-based routines and procedures that managers utilise in order to maintain or alter the patterns of business activities. The most widely accepted definition in the extant literature, as asserted by Thi Tu Le and co-authors (2024), is that of Chenhall (2003). This definition stipulates that the MCS refer to the systematic utilisation of management accounting to achieve corporate objectives and other controls, including individual and organisational controls.
In this work, the definition proposed by Thi Tu Le and co-authors (2024) is utilised; the MCS is comprised primarily of planned controls derived from accounting data, activity monitoring, integration and performance measurement mechanisms, and a delineation between administrative rules and strategic and operational controls (Thi Tu Le et al., 2024).
There are a number of control practices relating to sustainability, including environmental management control. This system is designed to ensure the governance of sustainable development. One definition of a sustainability control system is provided by Johnstone (2019), who state that it is "management accounting tools that link organisational strategy to operations in a given context by providing information and guidance, and by monitoring and motivating employees to continually develop sustainable practices and procedures for future improvement in sustainability performance" (Beusch et al., 2022).
The management control system has undergone a number of innovations in terms of practices, tools and the level of analysis: individual, organisational or institutional. In this evolutionary process, the MCS has integrated several domains, including sustainability.

2.3 Management control system and sustainability

From an organisational perspective, Otley (1999) asserts that the management control system encompasses objectives, strategies, measures, motivations and information flows, in addition to the context, which includes the external environment, organisational culture and social and historical control. It is evident that the MCS possesses a global perspective on the organisation. By incorporating external constraints, the scope of the MCS is not confined to financial aspects but extends to behavioural dimensions.
In the extant literature, two perspectives are generally recognised. Firstly, a traditional perspective, centred on control techniques and focused mainly on internal processes, confronted with the processes of planning, setting objectives, measuring performance and motivation. Secondly, a so-called modern perspective, focused on solving problems both inside and outside the organisation.
The implementation of the MCS has necessitated the development of a number of control mechanisms, i.e. tools, techniques or practices to assist decision-making, regulate direction and ensure convergence of objectives. Among these techniques, budgetary control remains the most widely used practice in public and private organisations, offering the advantage of interaction between the various players in the organisation (Malmi & Brown, 2008)Other techniques include the balanced score card (Kaplan & Norton, 2001), control through formal procedures (Simons, 1995) and social control through the values of Ouchi (1980).
Nevertheless, this discipline has undergone several innovations by integrating a greater number of practices and techniques that are both strategic and operational. The definition provided by Thi Tu Le and al., (2024) asserts that the term encompasses a series of techniques. The study emphasises the significance of "*control tools, such as planning, performance measurement and control for sustainable development, in addition to types of control, perspective control, rewards and compensation, within the context of research on management and control systems for sustainable development*" (Thi Tu Le et al., 2024). It is evident that the MCS is significantly

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impacted by advancements pertaining to the integration of sustainability. The term 'sustainability control system' or 'environmental management control' is frequently employed in this context.

The prevailing tendency in the extant literature is to cite "Environmental Management Accounting" (EMA) as the practice to which reference is most frequently made. The term is defined as follows: "*a system for generating, analysing and using financial and non-financial information with a view to optimising the ecological and economic performance of a company, thereby ensuring its sustainability. The objective of environmental management accounting is not to satisfy external stakeholders, but rather to enhance the quality of the information collected and utilised by managers*" (Antheaume, 2013). A considerable body of research has been dedicated to the study of environmental management accounting from a variety of perspectives. Burritt and co-authors (2002) proposed a taxonomy of environmental management accounting, delineating its multifaceted nature into various dimensions (Table 1). (Burritt et al., 2002)

Table 1: framework of Environmental Management Accounting

		Monetary Environmental Management Accounting (MEMA)		Physical Environmental Management Accounting	
		Short term focus	Long term focus	Short term focus	Long term focus
Past oriented	Routinely generated information	Environmental cost accounting (e.g. Variable costing, absorption costing, and activity based costing)	Environmentally induced capital expenditure and revenues	Material and energy flow accounting (short term impacts on the environment-product, site, division and company levels)	Environmental (or natural) capital impact accounting
	Ad hoc information	Ex post assessment of relevant environmental costing decisions	Environmental life cycle (and target) costing Post investment assessment of individual projects	Ex post assessment of short term environmental impacts (e.g. of site or product)	Life cycle inventories Post investment assessment of physical environmental investment appraisal
Future oriented	Routinely generated information	Monetary environmental operational budgeting (flows) Monetary environmental capital budgeting (stocks)	Environmental long term financial planning	Physical environmental budgeting (flows and stocks) (e.g. material and energy flow activity based budgeting)	Long term physical environmental planning
	Ad hoc information	Relevant environmental costing (e.g. special orders, product mix with capacity constraint)	Monetary environmental project investment appraisal Environmental life cycle budgeting and target pricing	Relevant environmental impacts (e.g. given short run constraints on activities	Physical environmental investment appraisal Life cycle analysis of specific project

Source: (Burritt et al., 2002)

In this respect, sustainability control tools appear to be closely related to those of the traditional MCS, and the authors of various studies have indeed mentioned different tools, grouped together under the concept of eco-control: Costing tools, induced environmental costs, life cycle costing, assessment of external costs, non-financial indicators (BSC), life cycle analysis in energy balances (Antheaume, 2013). The various tools applied to the integration of

sustainability are relatively old, and are more related to management accounting and cost monitoring. The emphasis is on financial performance and efficiency, rather than on an integrative approach to sustainability.
In a similar manner, these works frequently utilise traditional management control (Anthony, 1988) or organisational management control (Simons, 2000) as a point of reference, yet do not establish a distinct conceptual framework. The utilisation of a set of tools, either in the absence of a cohesive system of practices or in conjunction with an organisation's strategy, is indicative of a fragmented approach to management. Indeed, despite the implementation of local management control tools, non-financial information (social and environmental) is predominantly utilised for external communication rather than for environmental management control (Antheaume, 2013).
The incorporation of sustainability principles within the MCS framework has given rise to the development of numerous tools and practices that draw significantly from the CGMS domain. The extent of the adoption and integration of these tools into overall or purely financial performance is contingent on the performance objectives set.

3. Methodology

The literature review remains the most appropriate method of synthesising the results of past research in order to suggest avenues for future research (Snyder, 2019). The present literature review was conducted with an exploratory objective and then with a view to understanding. In order to ensure the reproducibility and relevance of the literature review, three stages have been established.
The initial step involves the compilation of relevant references from Google Scholar, as recommended by Thi Tu Le and co-authors (2024) in their literature review. The review suggests that “collecting data from alternative databases or Google Scholar could be a valuable approach for future research in the field of sustainability monitoring. In addition, further research is required to support the findings on sustainability MCS in different formats and in other institutions” (Thi Tu Le et al., 2024). The search terms employed were 'management control system' and 'sustainability'. It is evident that articles that do not directly relate to the subject, such as those dealing with the audit of environmental activities, are excluded. A secondary criterion is the indexation of the publication in one of the following databases: Elsevier, Cairn, Emerald, or Springer. Indexation in peer-reviewed journals is also a prerequisite. Subsequently, a publication date criterion was implemented (ranging from 2012 to 2024), however two articles of particular significance were incorporated due to their substantial citation frequency within relevant literature.
Following the application of the inclusion and exclusion criteria, 110 articles were selected for further analysis. The exported files were then imported into “Mendeley”, a software designed to streamline the analysis process and facilitate the management of metadata. A preliminary descriptive analysis was conducted, encompassing the number of articles published in relation to the year and a disaggregation according to the methodology employed. The results are presented in graphs 1 and 2. The third stage of the research process involves a meticulous examination of 46 articles related to the subject of this literature review were selected for analysis. The text has been coded in accordance with the respective research questions and results. Thematic analysis is then employed on the codes, which are grouped into themes. The following four themes have been identified: firstly, the impact of MCS on sustainability; secondly, the impact of sustainability on MCS; thirdly, manifestations of MCS integrating sustainability; and finally, the conditions for successful integration of sustainability in MCS. Subsequent to this data analysis, tables are elaborated to synthesise the results of the literature review. The subsequent section is devoted to the presentation of the descriptive and analytical results.

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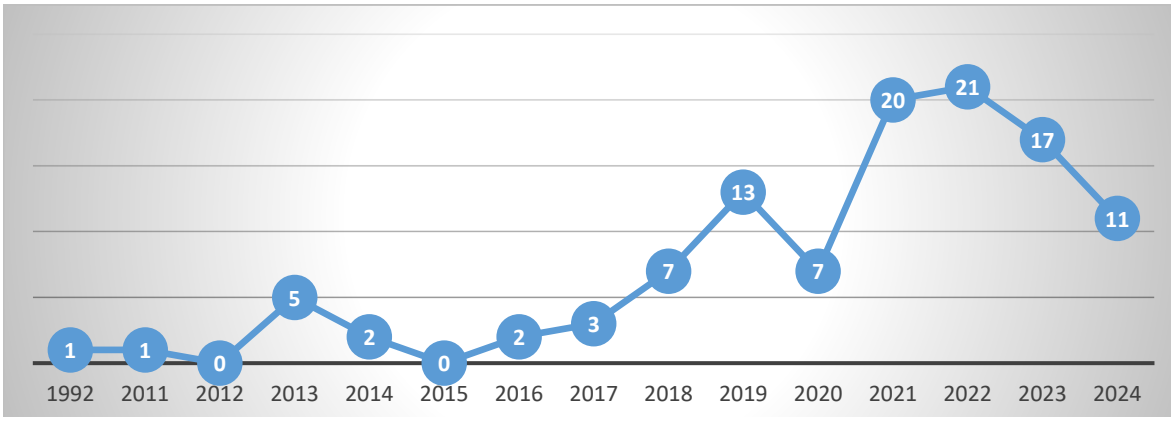
4. Results and discussion

This section is of paramount importance, as it delineates the various outcomes of the literature review. The descriptive results subsection provides an overview of the distribution of the articles selected for the literature review in terms of the number of articles per year and the methodology used. The following subsection contains a more detailed presentation of the analytical results according to theme.

4.1 Descriptive results.

A descriptive analysis of the extant research literature on management control systems and sustainability reveals several findings. Firstly, the substantial number of literature reviews demonstrate that this theory remains in a state of development. Secondly, empirical research has increased over the last two years (see Graph 1).

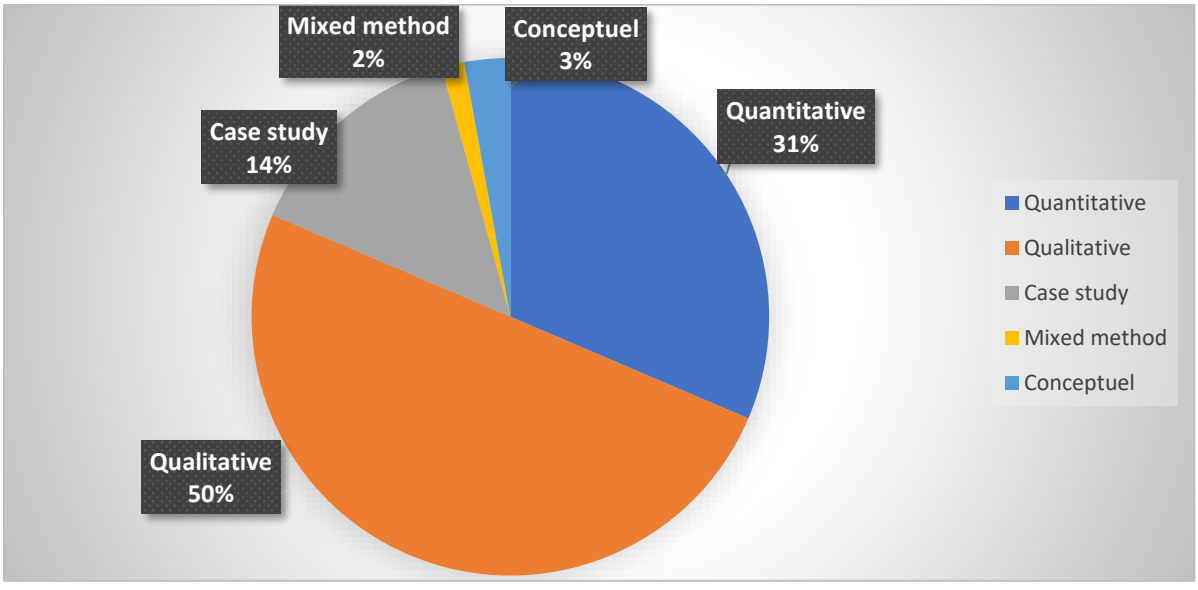
Figure 2: Distribution of the number of articles by year



Source: Authors

The prevailing research methodology employed, whether for investigative or experimental purposes, is characterised by a preponderance of work grounded in a quantitative approach. This methodological approach provides pertinent perspectives on the methods that should be prioritised in future research. (Graph 2).

Figure 2: Distribution of articles according to their methodology



Source: Authors

4.2 Analytical results

The analysis of the articles, through the research questions and the results found, enables several questions to be answered. The presentation of these results initially follows a tabular arrangement, subsequently accompanied by a thorough analysis.

Table2: Classification of the relationship between sustainability and MCS in literature.

Categories		Main idea	Author(s)
Impact of sustainability on the MCS		Operationalization of CSR	Rasolofo-Distler (2019) Nancy Mohamed (2022) Ahmed (2022) Bui et al (2022)
		Obligation to disclose societal performance information.	Pizzi et al (2024) Sundin et Brown (2017)
Impact of MCS on sustainability		The use of innovative MCS practices improves business sustainability	Varzaru et al (2022) Mueller et Weber (2023) Phan et al (2018)
		Mediating role of MCS between other systems and overall performance (integrating sustainability)	Akunkunda et al (2024) Badawi et al (2024) Werastuti et al (2023)
		Incentives to introduce environmental innovation	Gomez-conde et al (2019) Narayanan et Boyce (2019)
Integrative MCS	Use of MCS as an environmental control practice	Integration involves the use of environmental CDG practices	Ligonie (2021) Broccardo et Mauro (2023)
		Effect of this integration by sector, status, business model	Nyahuma (2022) Charriot et Vidal (2020) Maughan (2023) Damanik et al (2023) Aureli et al (2023) Rosa et al (2023)
	Sustainability reporting brings financial and social benefits	Strengthening trust between civil society and donors The value of information provided by analysts is enhanced by social and environmental disclosure.	Gazzola et al (2021) Bernardi et Stark (2018)
	As a strategic component	Align strategy with SD objectives Start the innovation process Improve social strategies Through leadership convince of the importance of sustainability Ensure the vision of ambidextrous companies Using the value system to ensure a balance between stability and flexibility	Djamal et Hermawan (2023) Sarie et al (2020) Parker et Chung (2019) Beush et al (2022) Traxler et al (2020) Main et al (2022)

Source: Authors

4.2.1 The impact of sustainability on the CGMS.

The integration of sustainability principles within the management control system is characterised by the adoption of environmental management practices, the disclosure of non-financial information through environmental reporting, and the adaptation of management control practices to address sustainability issues.

The operationalization of CSR (Corporate social responsibility) through performance management systems is indicative of one of the effects of sustainability on the MCS, as the management of change imposed by sustainable development requires long-term planning, permanent adjustment of strategy and the capitalisation of knowledge. Furthermore, it

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emphasises the MCS as a conduit for the translation of requirements into action, both from the perspectives of internal and external stakeholders (Rasolofo-Distler, 2019). In the study conducted in Egypt, it was examined how the adoption of environmental MC practices is influenced by three characteristics. These characteristics include sensitivity of the activity to the environment, environmental strategy, and the size of the company. The results of the study demonstrated that only the environmental strategy has a significant impact on the adoption of environmental practices. Furthermore, it was found that these practices have a positive effect on performance (Ahmed, 2022). Furthermore, novel environmental data, including carbon emissions, which are the primary cause of global warming, are prompting organisations to adopt various strategies and management control systems, such as carbon accounting systems (Bui et al., 2022).

The adoption of novel sustainability-related practices has been demonstrated to have a significant impact on the management control system. Nevertheless, it remains challenging to ascertain whether these practices contribute to enhancing environmental quality by reducing carbon emissions (Bui et al., 2022). Moreover, the adoption of these practices is more in line with the objective of making organisations accountable by monitoring and reporting to stakeholders (Sundin & Brown, 2017).

A secondary consequence of sustainability and its incorporation into the organisation's processes, whether upstream or downstream, is the transformation of the nature of information contained in the reporting. The intervention of regulatory bodies, through the introduction of strict standards, and that of funding bodies, has led to the disclosure of economic, social and environmental results via ESG (Environmental, Social and Governance). This development is inextricably linked to a broader movement aimed at enhancing technological capabilities, thereby ensuring greater accountability on the part of organisations towards their various stakeholders (Pizzi et al., 2024).

In particular, the European Union's Agenda 2030 called on Member States to "*encourage enterprises, in particular large enterprises and transnational corporations, to adopt sustainable practices and to integrate sustainability information into their reporting cycle*".

4.2.2 Impact of MCS on sustainability

In the context of the extant literature, and drawing upon the contributions of Vărzaru and al., (2022) as well as Mueller and Weber (2023), it is evident that the integration of innovative practices within the sphere of MCS has the potential to enhance the sustainability of corporate entities. The authors posit that the adoption of management control practices that facilitate the measurement of overall performance and the management of the sustainable approach ensures superior outcomes. The enhanced quality of the information utilised for performance monitoring and optimised decision-making (Phan et al., 2018) can be attributed to these outcomes. This enhancement in decision-making can be illustrated by the implementation of cost analysis based on environmental activities.

The MCS fulfils a secondary function in its capacity as an intermediary between disparate systems, including those responsible for human resources and overall performance. According to Akankunda et al. (2024), there is a compelling argument for managers to align their sustainability strategies with HR strategies. The aforementioned observation is also applicable in the context of information technology innovation within the MCS, which has been demonstrated to influence sustainable value creation through the development of a competitive advantage in terms of decision-making (Badawi et al., 2024). The implementation of environmental management accounting has been shown to enhance the quality of data within the sustainable performance information system (Werastuti et al., 2023).

It has been demonstrated by other studies that the MCS exerts an effect on sustainability by way of the incentive to introduce environmental innovation. Indeed, the prospective use of the

MCS, using Simons' (1995) theoretical framework of levers of control, "*triggers the implementation of environmental innovation practices, which then translates into high operational performance*" (Gomez-Conde et al., 2019). In a separate study, Narayanan and Boyce (2019) investigated the function of MCS in the context of organisational transformation towards sustainability. Their findings indicated that, while the role of MCS is not particularly pronounced, its existence is substantiated. The study emphasised the necessity for further investigation to ascertain the underlying causes of the observed deficiencies in this role (Narayanan & Boyce, 2019)

The interactive role of management control has been analysed by Renaud (2013), who has also confirmed this role in environmental control. Furthermore, this analysis allows us to classify this role into four categories: eco-designers, eco-institutional, eco-managers and eco-educators.

4.2.3 The integration of sustainability into management control systems

- ***As environmental control or management practices***

A range of studies included in this literature review have utilised experimental, confirmatory, or theoretical methodologies to investigate the integration of sustainability and the implementation of environmental management control practices. This use is primarily substantiated by an enhancement in financial performance (Ligonie, 2021). For instance, given that electricity consumption constitutes a cost element, the adoption of sustainable reporting protocols can facilitate the control of energy consumption and sources, thereby enhancing environmental performance while concomitantly improving financial performance. The utilisation of sustainability monitoring tools facilitates the expansion of the scope of the information gathered, both internally and externally, in terms of quantity and quality (Broccardo & Mauro, 2023).

The efficacy of this integration has been corroborated by a number of other studies, which have examined its impact according to sector of activity, status of the company, or choice of business model. In the hotel industry, the ability to respond to customer demands is considered a key asset (Nyahuna, 2022). In agricultural businesses, the application of social and environmental accounting has enabled the measurement of new data (Charriot & Vidal, 2020). Furthermore, environmental management accounting and social and environmental reporting in family businesses have been shown to improve decision-making processes (Maughan, 2023). The study by Damanik et al. (2023) on mining companies in Indonesia demonstrates that "*the implementation of a management control system and an environmental management control system is imperative to enhance the company's environmental performance, which in turn will have a bearing on its financial performance*" (Damanik et al., 2023).

The selection of a business model exerts a significant influence on the adoption of integrated sustainability and the implementation of a circular economy from a management control perspective. This, in turn, impacts decision-making processes by transcending the confines of formal accounting and control frameworks. The utilisation of informal tools and life cycle analysis facilitates the establishment of a dialogue with various stakeholders, thereby fostering success (Aureli et al., 2023).

Ecosystems have been shown to play a pivotal role in the integration of sustainability into management control frameworks (Rosa et al., 2023). A study conducted on catering companies reveals that the green innovation ecosystem enhances environmental performance, as evidenced by a reduction in water wastage among the studied companies.

Despite the evidence from numerous studies that these practices are effective in integrating sustainability, others have expressed criticism, citing the prioritisation of purely financial performance (Charriot & Vidal, 2020) and the existence of a discrepancy between the extant literature and the utilisation of these practices (Corsi & Arru, 2021).

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- ***Disclosing non-financial performance: the use of reporting***

Reporting is an important management control tool in terms of disclosing financial information, and it takes various forms, including integrated reporting. Since 1995, there has been an increasing trend in the publication of sustainability reports by organisations, as evidenced by the findings of KPMG[2] (2017). The role of intellectual capital reporting was analysed in relation to other forms of reporting. The study's findings indicate that financial information is given higher priority than other types of information, despite the existence of various financial regulatory bodies (Traxler et al., 2020).

The results of the study demonstrate that sustainability reporting provides financial and social benefits that serve to strengthen the building of trust between civil society and donors (Gazzola et al., 2021). The study validates the significance of the value of information concerning social and environmental activities and performance. Furthermore, it substantiates the correlation between this value and each piece of information. Bernardi and Stark's (2018) study established a positive correlation between analyst monitoring and the quality of social and environmental disclosure.

Notwithstanding the increasing utilisation of environmental, social and governance (ESG) ratings, a lack of consensus persists among rating agencies regarding the evaluation of corporate entities (Christensen et al., 2022). In their 2022 study, Adams and Abhayawansa examined the underlying causes of these myths, concluding that they stem from a combination of disappointment and misunderstanding between practitioners and academics. As demonstrated in the research, there is a lack of consideration for the different users of corporate sustainability information. There is also a lack of analysis of alternatives, an overestimation of the expertise of the International Financial Reporting Standards (IFRS) Foundation and a mischaracterisation of sustainable finance/ESG (Adams & Abhayawansa, 2022).

With regard to the critiques concerning ESG, it has been demonstrated that the index exhibits an absence of connectivity and a significant degree of dispersion. This dispersion (heterogeneity of KPI[3]) raises the operational difficulties of constructing CSR reporting standards (David & Giordano-Spring, 2022).

- ***As a strategic element***

A growing body of literature has emerged on the subject of companies being under increasing pressure to implement management practices and integrate them into their strategy. The most well-known practice at strategic level is the alignment and measurement of impact on sustainable development objectives (Dagmar & Hermawan, 2023), the initiation of innovation processes (Sari et al., 2020), and the improvement of social strategies (Parker & Chung, 2018) through intense dialogue between managers at different organisational levels. The degree to which strategic managers focus on external sustainability factors is also of particular interest. Ultimately, the responsibility for ensuring that sustainability remains a priority can be shouldered by the top manager, who must demonstrate a personal commitment to the cause and communicate this effectively (Beusch et al., 2022), this measure is particularly salient in ambidextrous organisations due to the interaction between the director and the team of managers (Maine et al., 2022). Conversely, the integration of culture and value systems into the company's strategy ensures the optimal balance between flexibility and organisational stability. The implementation of strategic objectives linked to sustainability is facilitated by cultural control.

However, studies have observed that companies in general consider sustainability as a plus and not as a strategic objective (Dagmar & Hermawan, 2023), and that the predominance of the

[2] *Consulting and assurance firm, (En français, Cabinet d'audit et de conseil international)*
[3] *Key Performance Indicator*

traditional financial control system over the social and environmental management control system is evident (Parker & Chung, 2018).
The second table provides a synopsis of the criticisms of sustainability currently employed:

Table 3: the criticisms of sustainability currently employed

Axis	Explanation	Author(s)
Practice	Focus on financial performance and discrepancy between literature and usage	Charriot et Vidal (2020) Corsi et Arru (2021)
Reporting	The effect of ESG reporting on sustainability is unclear	Adam et Abhayawanan (2022) Christensen et al (2022) David et Giordano-spring (2022)
Strategic Framework	In practice, sustainability is frequently regarded as a secondary consideration, superseded by the primacy of financial performance.	Parker et Chung (2018)

Source: Authors

4.2.4 Conditions for successful integration

The subsequent table provides a concise overview of the prerequisites for effective integration.

Table 4: Conditions for successful integration

Areas for action	Author(s)
Interdependence between practices Connectivity between financial and non-financial reporting Use of different control levers Increasing the value of non-financial information Mitigating the tensions arising from the adoption of the green system	David et Giordano-spring (2022) Gomez-cond et al (2019) Reimbach et al (2018) Kirchner-krath et al (2024)
Acting through organisational behaviour, managers' perception and value system Synchronisation of tools (coherent system)	Zharfpeykan et Akroyd (2022) Johnstone (2019) Brosia et Bergerg (2019) Sundin et Brown (2017) Tahar (2020)
Review the training of future management controllers, development education, changing the mind-set of future managers	Kwistianus et al (2021)

Source: Authors

The findings of various studies indicate the conditions that are necessary for the successful integration of sustainability into management control systems. The first of these relates to practices and their implementation principles. The interdependence between the results presented by accountants and management controllers has an effect on sustainability controls. The findings reported here are independent of the size of the company and its activity; the degree of connectivity between financial and non-financial reporting conditions; the quality of this integration (David & Giordano-Spring, 2022); and the use of different control levers in the sense of Simons (1995) improves the effect of environmental innovation practices on operational performance (Gomez-Conde et al., 2019).
In the context of corporate sustainability, non-financial information pertaining to sustainability is progressively acquiring greater value. Two contemporary trends in non-financial reporting can be identified: integrated reporting and sustainable information assurance. The present study examines the manner in which the selection of reporting format interacts with the voluntary assurance of sustainable information (Reimsbach et al., 2018). In this framework, the authors address the challenges and constraints of adopting the sustainability system at the organisational level; the results confirm the dilemma and tensions that arise from adopting the green system (Kirchner-Krath et al., 2024).

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The second strand focuses on organisational behaviour and the perception of managers regarding the significance of integrating these indicators into a performance management system (Zharfpeykan & Akroyd, 2022). The configuration of a sustainability monitoring system is contingent on the manner in which it is utilised by employees at all hierarchical levels within an organisation (Johnstone, 2019). The integration of competency values is achieved through the value system. These factors facilitate the process of provoking personal and professional values, a phenomenon that can be attributed to the presence of a catalyst, namely the leader's talent (Brosia & Bergery, 2019). The hypothesis that environmental issues are integrated by organisational behaviour towards the CSM are confirmed by studies (Sundin & Brown, 2017). As Tahar (2020) contends, the synchronisation of tools, strategy and actors is imperative in order to achieve a coherent system. The study under discussion sheds light on the necessity to deconstruct the automatisms of actors by restoring meaning to tools and practices in order to facilitate this synchronisation (Tahar, 2020).

The third condition is oriented towards the future by means of the training of accounting and control students. The implementation of contemplative pedagogy, total awareness and development education has been identified as a key factor in effecting a change in the students' state of mind. The theoretical model utilised herein demonstrates a shift in self-perception, values, beliefs, and perspectives on business, society, and the environment. The impact of educational paradigm (private versus public), the curriculum, and the academic level on students' perception of the significance of sustainability, information technology practices, and accounting is a subject that merits further investigation (Kwistianus et al., 2021).

5. Conclusion

The objective of this literature review is twofold: firstly, to analyse the trend of past studies on the subject of integrating sustainability control into management control systems, and secondly, to draw out research gaps and suggest avenues for future research.

The results of this literature review are summarised in several contributions; there is growing pressure from both internal and external sources to integrate social and environmental aspects with economic and financial aspects. Control systems, particularly management systems, are increasingly integrated into the same systems and processes. The initial contribution examines the impact of sustainability on MCS, through the adoption of novel environmental practices. In addition to the impact of MCS on sustainability, which is characterised by an enhancement in sustainability performance, this improvement remains negligible in comparison to financial performance. The second contribution is that of verifying the extent to which sustainability is integrated into the MCS at the practical and strategic levels. A review of the extant literature reveals the interest shown by different sectors of activity and different companies in integrating so-called sustainable practices. Nevertheless, there is a consensus among several researchers that these practices are not yet fully integrated into organisational behaviour, and that efforts are required to implement a sustainable value system. It is an infrequent occurrence for strategic objectives to encompass sustainability objectives. It is evident that practices and strategies have become increasingly aligned with the disclosure of financial information as part of integrated reporting.

A critique and presentation of some possible solutions form the basis for suggestions for future research, namely the synchronisation of practices, managers' behaviour in adopting new practices and their effective integration, and finally training in accounting and control to prepare future managers with a mind-set ready to promote and fully integrate sustainability.

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