



# Innovative management accounting practices for sustainability of manufacturing small and medium enterprises

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## Abstract

The environment in which manufacturing small and medium enterprises operate has become very complex, and therefore manufacturing SME's owners need to be aware of the impact their decisions have on the environment and society. The aim of the research was to identify which innovative management accounting practices can be integrated into manufacturing SMEs' strategies to overcome the challenge of being blamed by stakeholders as contributors to social and environmental problems. Published articles were sourced from the University of South Africa's online library using keywords. A systematic literature review was employed to discover themes and concepts during secondary data gathering to detect traditional and innovative MAPs in management accounting literature all over the globe. The qualitative data analysis and research software, Atlas.ti was used to synthesise the data. Thematic analysis was used to evaluate the occurrence of words, phrases, themes, metaphors, and the construction of concepts in MAPs literature. During the analysis, seven innovative MAPs (activity base costing/budgeting; product life cycle costing; total quality management; environmental costing; target costing; kaizen costing and value analysis) were identified. It is recommended that manufacturing SMEs integrate these innovative MAPs into their strategies to impact their environmental, social, supply chain management and recycling policies to promote operational efficiency to achieve sustainability. Further research to identify influencing factors; strategic procedures; and the environmental and social benefits of integrating these identified innovative MAPs into manufacturing SMEs to achieve sustainability, should be undertaken.

**Keywords** Environment · Innovative management accounting practices · Manufacturing · Small and medium enterprises · Social · Sustainability

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# 1 Introduction

Manufacturing controls the well-being and wealth of every economy; however, it also directly or indirectly leads to the depletion of the ecosystem and burdens society (Bonvoisin et al., 2017). As a result, society today blames manufacturing enterprises as partly causing global social and environmental problems (Capros et al., 2016). Therefore, high profile multi-national enterprises are also experiencing pressure from stakeholders and broader society to contribute towards environmental sustainability (Syakir et al., 2017; Wangombe, 2013). Jalaludin et al. (2011); Lucas et al. (2013) and Ntalamia (2017) argue that for enterprises to mitigate this pressure from stakeholders, they may need to integrate Management Accounting (MA) into their strategy to help reduce the pressure tarnishing their image in society. Nair and Nian (2017); and the Chartered Institute of Management Accountants (CIMA, 2014), describe MA as the process to assist with decision-making to create value and guarantee sustainable achievements. This is attained when the information provided and analysed allows enterprises to plan, implement and control their strategies. Furthermore, MA provides managers with information to make sound decisions (Dubihlela & Rundora, 2014; Matambele & van der Poll, 2017; Ratnatunga et al., 2015; Tilt, 2018). As a result, the number of enterprises that integrates MA as a practice to disclose their impacts through social and environmental activities in annual reports has increased substantially during the past few years (CIMA, 2014).

However, research shows that manufacturing Small and Medium Enterprises (SMEs) are mostly unwilling to integrate environmental strategies or accept voluntary strategies such as ISO14001 and ISO14004 (Mat et al., 2018; Tuczec et al., 2018). Despite the increased number of studies on MAPs over the decades, little is known about innovative MAPs' integration effectiveness into SMEs' strategies (Ahmad, 2017; López & Hiebl, 2015; Shields & Shelleman, 2015). Furthermore, Volker (2015); and Nair and Nian (2017) argue that large enterprises are favoured for MA empirical research since they have the expertise and capacity that promotes innovative MAPs' integration. This may create challenges for the study of innovative MAPs in manufacturing SMEs. However, Lynch-Wood and Williamson (2014); and Volker (2015) argue that studies into SMEs may provide different data and settings on fundamental explanations and understanding of the practices within the SMEs sector. They argue that SMEs might even provide less complex settings, which is not provided by large enterprises.

According to the researchers, the literature review shows that little research was undertaken in an attempt to identify suitable innovative MAPs for manufacturing SMEs' sustainability. Alkhajeh and Khalid (2018) argue that MAPs have an impact on SMEs performance that may lead to increased productivity. According to Maziriri and Mapuranga (2017); and Kefasi (2019), manufacturing SMEs in the Gauteng and Western Cape provinces, which are industrial hubs in South Africa, uses traditional MAPs in costing, budgeting, performance evaluation, decision-making and strategic analysis. Furthermore, Ngibe and Bingwa (2020) identified that even though manufacturing SMEs' managers are clearly aware of the strategic impacts and benefits of integrating contemporary MAPs as an innovative strategy for sustainability, due to economic challenges associated with its integration, they opt for traditional MAPs. Bearing this in mind, the researchers sought to address the problem by identifying innovative MAPs that can assist manufacturing SMEs to achieve environmental and social sustainability. As a result, the following research question will be addressed:

Which innovative MAPs can be integrated into manufacturing SMEs' strategy to achieve environmental and social sustainability?

To answer the research question above, the under listed sub-questions were dealt with:

RSQ1: What are the traditional and innovative MAPs that manufacturing SMEs can integrate into their strategy?

RSQ2: Which innovative MAPs have environmental, social and sustainable development impacts on manufacturing SMEs' decision-making?

The main finding concludes that innovative MAPs can enable manufacturing SMEs to protect the environment and society through integrating sound environmental; health and safety; supply chain management and recycling policies that may enhance their operational efficiency and subsequently promote their achievement of economic sustainability in the long run. The research breaches the existing gap between theory and practice by identifying seven (7) innovative MAPs that manufacturing SMEs can integrate into their strategies to achieve sustainability.

The structure of this article is as follows: the background to the study is portrayed by defining SMEs and their role in the economy, discussing management accounting practices (MAPs), management accounting change and environmental and social changes in MAPs. This is followed by the research methodology, data analysis and a discussion on the findings. Finally, the article concludes highlighting the findings, contributions, limitations and further research suggestions.

## 2 Background

### 2.1 Definition and the role of SME's in the economy

SMEs have no singular definition universally and are therefore, defined differently by various countries' legislative frameworks. In South Africa, they are known as small and medium enterprises (SMEs) or small businesses. The National Small Enterprise Act (Act 2019) in South Africa defines an SME as a "separate and distinct business entity, together with its branches or subsidiaries, if any, including cooperative enterprises, managed by one owner or more, predominantly carried on in any sector or subsector of the economy" (Act 2019:1). They employ less than 250 employees and have a turnover of less than R170 million. Although Australia has a number of SMEs and acknowledges their contribution to the economy, they do not have a uniform legislative definition (Commonwealth of Australia, 2018). However, they do indicate that if it is a manufacturing enterprise, the enterprise employs less than 100 employees. The European Commission (2015) defines an SME as an enterprise employing less than 250 employees, annual turnover less than Eur 50 million or a balance sheet total less than Eur 43 million. They also value SMEs as engines of growth. The US small Business Administration (SBA, 2013) introduces Small and Medium Sized Manufacturers in the United States of America (USA) as those enterprises employing less than 500 employees and having less than \$100 million sales.

The development of SMEs is the first step towards economic development and industrialisation (Mat et al., 2018) and they are therefore an engine of growth through which economic objectives are achieved (Ayub, 2018; Dubihlela & Rundora, 2014: 28; Mat et al., 2018). SMEs contribute to a healthy economic sector through creating employment opportunities; high production units; export growth; and the introduction of innovation and entrepreneurial skills (Mahembe et al., 2011: 14; Le et al., 2018). Therefore, governments

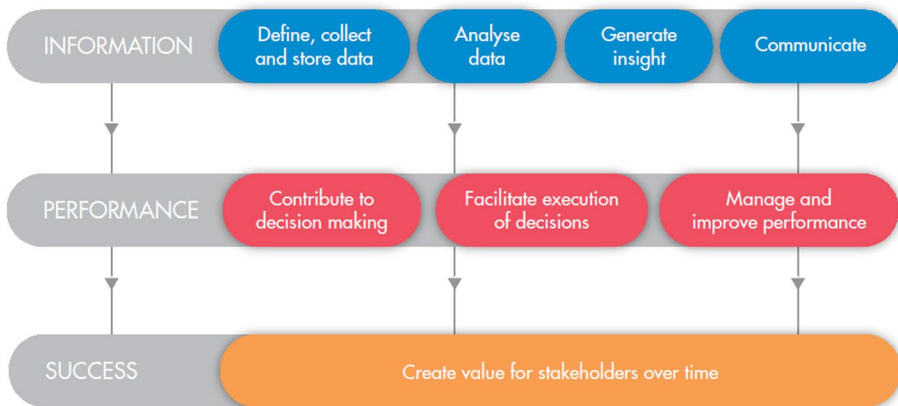
all over the globe are initiating strategies to safeguard the development of a vibrant SME sector to promote their sustainability (Olalekan & Jumoke, 2017). Hence, SMEs have come under the spotlight among management accountants and scholars all over the globe (Ayub, 2018; Johnson & Schaltegger, 2016).

## 2.2 Management accounting practices (MAPs)

Technological advancement is causing complex change across the globe hence; enterprises are susceptible to change (CIMA, 2014: 1; Neziraj & Shaqiri, 2018: 22). Currently, large enterprises and SMEs are competing to be the most innovative in the twenty-first century. The idea of long-standing economic improvement is being challenged as both the capacity and speed of data delivery escalate (CIMA, 2014: 2; Neziraj & Shaqiri, 2018: 22). Most importantly, enterprises are doing more to react correctly to emerging risks and defend their created economic values when information is not abundant, difficult or demand complex technology to interpret (CIMA, 2014: 6; Matsoso & Benedict, 2014: 248; Neziraj & Shaqiri, 2018). Against this backdrop, MA is more relevant than ever and in general, is defined as a system that identifies, measures, evaluates, accumulates, analyses, prepares, and interprets data to assist management in decision-making to achieve the enterprise's objectives (Ahmad & Leftesi, 2014; Radović-Marković & Vučeković, 2015: 186; Drury, 2018). Drury (2018) argues that MAPs deal with the provision of information to improve the enterprise's internal decision-making, performance and efficacy in the enterprise's strategy. MAPs enable forward-looking internally and creates structured answers to unstructured problems, enables enterprises to gather information that ensure strategic decisions are reached and reported meritoriously (CIMA, 2014: 3; Neziraj & Shaqiri, 2018). Therefore, MAPs may be suitable to be integrated into manufacturing SMEs strategies to facilitate effective decision-making towards sustainability.

The need for MAPs to be integrated is that, MAPs create sustainable values through sound decision-making by ensuring complete analysis of data to support SMEs to evaluate, plan, coordinate, and control the implementation of their strategies (CIMA, 2014: 5). Furthermore, MAPs facilitate the accessibility of appropriate and correct information to back enterprise's activities for effective decision-making. Hence, SMEs' sustainability and long-term value will be created for stakeholders (CIMA, 2014: 6; Neziraj & Shaqiri, 2018). Rufino (2014) argues that the adoption of innovative MAPs by enterprises to counter environmental and social changes was stimulated by the global crises facing enterprises. MAPs are business practices, which may assist enterprises to create value with sustainable development through the technical skills of management accountants (Nuhu et al., 2016). Through training, management accountants develop special knowledge to uniquely place them to contribute to enterprises' sustainability (Prowle & Lucas, 2016). Innovative MAPs produce evidence-based reports to solve management problems such as costing, risk and value analyses in enterprises' strategy and provide data justification (CIMA, 2014; Sharma, 2015). Amara and Benelifa (2017) argue that innovative MAPs harmonised the internal and external factors of enterprises. Furthermore, it also assists management accountants to collect, evaluate and analyse available data and develop scenarios to project alternative outcomes that may benefit the enterprise's objectives in the context of social and environmental factors (Namazi, 2013). This data flow is shown in Fig. 1.

Figure 1 supports Rufino's (2014); and Matambele and van der Poll's, (2017) argument that MAPs are accounting practices that support management decision-making



**Fig. 1** Management accounting information flows. *Source:* CIMA (2014:6)

internally based on economic, monetary and non-monetary data generation. Hence, MAPs assist decision-making which might promote manufacturing SMEs sustainability.

### 2.3 Management accounting change

The most important challenge confronting enterprises in this technology age is the process of acquiring the right mix of data to plan cost of production, quality and time-related activities in enterprises (Matsoso & Benedict, 2014). According to Shah et al. (2011), traditional MAPs identified in RSQ1 (Fig. 3) is inadequate to provide the necessary information in this twenty-first century. They argue that traditional MAPs focuses on the past, are too narrow and mislead managers to plan, evaluate and control decision-making of enterprises in the emerging era when planning, evaluating and controlling. The reason being that these MAPs focus on expired information (reports on transactions that have already taken place and not what is expected). Moreover, Ramljak and Rogošić (2012) argue that the emphasis of traditional MAPs also neglects the environmental issues where management decisions are taken and integrated into an enterprise's strategy as a major weakness in the 21st-century business contextualisation. According to Amara and Benelifa (2017), many factors influence the change in MA within enterprises. They argue that environmental uncertainty, structures, size, activities, market competition, technology, design, information complexity and strategies are drivers of change in enterprises. According to Ntalamia (2017), such changes may originate owing to diverse factors in the economic and cultural environment. As a result, some studies focus on changes in MAPs (Alleyne & Weekes-Marshall, 2011; Tuanmat & Smith, 2011; Sunarni, 2013:616). Furthermore, IoDSA (2016:14) argues in the King IV report that the economic business environment has changed with the advent of fast-moving technology's influence on the strategic activities of enterprises. Hence, manufacturing SMEs may need to change from traditional MAPs to innovative MAPs that may provide them with the necessary tools to compete effectively in the twenty-first century.

The next section discusses the environmental and social MAPs changes.

## 2.4 Environmental and social changes in management accounting practices

Global competition may be leading all enterprises towards reformed obligations, high levels of operational excellence and competitiveness (Dubihlela & Rundora, 2014:27; Smith, 2015:76; Hamann et al., 2017). With economic instability, Annandale (2013:54) and Hamann et al. (2017) enquired how SMEs can benefit from sustainability. To answer this, it is argued in this article that by integrating innovative MAPs into SMEs' strategy, management would be able to identify environmental, social, and economic strengths, weaknesses, opportunities and threats (SWOT) during decision-making. Innovative MAPs as seen in enterprises in the twenty-first century involve environmental and social changes, emanating from enterprises' change prompted by a new interest in practices relating to sustainability. This rise of innovative MAPs attracted the attention of various scholars (Ahmad, 2017; Ahmad & Zabri, 2016; Azudin & Mansor, 2017; Bonvoisin et al., 2017; Maziriri & Mapuranga, 2017; Nair & Nian, 2017; Nuhu et al., 2016; Prowle & Lucas, 2016). These scholars have mainly been evaluating which MAPs such as costing, budgeting, planning, pricing and performance strategies in enterprises have changed to embrace environmental and social issues (Cuzdriorean, 2017; Nair & Nian, 2017; Rufino, 2014; Uyar, 2010). Their studies identify the changes to comprise environmental strategies, health and safety strategies, legal regulations, inclusive total quality management (TQM), and sustainable development. Furthermore, the scholars argue that environmental strategic prospects are identified in the process of integrating, that is, environmental technology, energy conservation strategy, products design, market packaging, and recycling. These activities demand innovative MAPs to evaluate strategic cost/benefits analysis, alternative cost savings scenarios, full life-cycle costing (LCC), activity-based costing (ABC), reports on waste control, investment appraisals, management control and performance evaluation (Biernacki, 2015; Ntalamia, 2017; Nucci et al., 2016; Testa et al., 2011). For instance, innovative MAPs might identify, measures and link environmental and social accounts to capital budgeting (Ndwiga & van der Poll, 2013; Nuhu et al., 2016). Therefore, innovative MAPs may be viewed as those practices that support internal management to perform their function of planning, controlling, decision-making, evaluation, and long-term strategic development.

According to Biernacki (2015), innovative MAPs are not necessarily seeking the abolishment of traditional MAPs, however, it is more of the integration of environmental and social practices into MA. Hence, Namakonzi and Inanga (2014); and Maziriri and Mapuranga (2017:20) argue that innovative MAPs are holistic concepts, which combine environmental and social activities and integrates them into enterprises' strategy to assist environmental and social costs' identification and the measurement of production efficiency. These main functions relate to human, social, economic, and environmental aspects which manufacturing SMEs should report (Arena & Azzane, 2012; Lemus, 2016).

From an environmental viewpoint, SMEs are known to be irresponsible, owing to their limited knowledge of MAPs (Ramli & Ismail, 2013; Mat et al., 2018; Ngibe & Bingwa, 2020). As a result, there may be a need for regulatory agencies to be careful when designing frameworks and regulations to ensure that such policies promote benefits for SMEs' involvement in environmental and social sustainability (Jamil et al., 2015; Nair & Nian, 2017:182). According to Vandayar (2015:54) and Smith (2015), corporate governance philosophies are not only responsible for the survival of large enterprises; SMEs can also benefit from integrating such strategies that reinforce professional behaviour. Stubblefield et al. (2010) argue that the major reason for SMEs to adopt innovative MAPs is not the leading edge, however, it is since the

planet matters to them. As MAPs change to accommodate social and environmental impacts of enterprises in management accounting, manufacturing SMEs may stand a chance to effectively protect the environment, which supports their existence to achieve sustainability through the integration of innovative MAPs.

### 3 Research methodology

The method employed in this research involved a systematic literature review. This is considered appropriate in order to address the research problem. Marshall and Rossman (2014) advocate that the researcher should firstly consider data analysis issues pertaining to the research and secondly, processes of analysing conceptual qualitative data begins at the moment data is collected and proceeds thereafter (Creswell, 2014). Hence, the researchers considered the research questions and decided to conduct a systematic literature review. The researchers opted to use desktop research as a tool to collect the necessary literature to answer the questions. The Unisa Library was used to search for all the necessary frameworks, publications, and articles on MAPs, SMEs and theoretical frameworks globally.

#### 3.1 Data collection process

During this data collection process 350 articles were identified using the following keywords:

- Innovative management accounting practices;
- Management accounting;
- Management accounting change;
- Environmental and social accounting change;
- Sustainability accounting;
- Sustainability management accounting;
- Innovative management technology;
- Environmental management accounting;
- Environmental management system; and
- Social accounting.

The researchers deemed it appropriate to adopt the philosophy of Creswell (2014), and Wouters et al. (2016) to track subject concepts and data from a wide range of literature through which the following articles were rejected:

- Articles that only mentioned MAPs briefly, however, the content was misaligned with the scope of this research.
- Articles that mentioned MAPs, however, it was articles referred to in the reference list.
- Articles where MAPs were not mentioned at all (that is, the article pops up due to a search term as a result of words in phraseology or at the end, or due to another language –connected context or the abbreviation of the MAPs however a different connotation).
- Articles which are antecedent of alternative articles with less data important to the research.



- Articles that were an introduction to another article or merely constituted a brief systematic literature review or an abstract of successive articles.

The screening identified 60 articles suitable for analyses. The conceptual data collection process requires an interactive stable movement of concepts and data, and related continuous procedures across all indications to regulate the level and scope evolved in data (Creswell, 2014). The following data collection processes were adopted:

- Mapping of data routes;
- Analysing and classifying the identified data;
- Recognising and coding of concepts;
- Deconstructing and sorting of concepts;
- Integrating and re-integrating concepts;
- Synthesising, and re-synthesising to make sense out of them all;
- Establishing credibility, transferability and conformability of concepts; and
- Re-thinking of the concepts and frameworks.

### 3.2 Data analysis

A thematic analysis was used in this qualitative study. This choice was justified by the arguments of the under-mentioned scholars. Bryman and Bell (2015) define thematic analysis as a method that analyses documents and scripts to enumerate content relating to pre-arranged groupings, methodical and in a replicable manner. The major practice of thematic analyses comprises coding the collected data in order to identify a qualitative data set for analyses (Cooper & Schindler, 2014). Furthermore, Saunders et al. (2016) propose three (3) main sources to derive names for coding:

- Using terms that appear in data;
- Actual terms used by study participants; and
- Terms used in existing literature.

The thematic data were derived from existing literature. The researchers considered it a suitable approach to use a thematic analysis to understand the meaning and the content of the MAPs literature. The qualitative data coding and analyses software of Atlas.ti was used to synthesise data from the identified MAPs literature.

### 3.3 Trustworthiness of the study

Bashir et al. (2008:38) argue that a paradigm is a worldview that bridge ontology, epistemology, axiology and the quality of a social study completed within a paradigm must be judged by its own paradigm's terms. Centred on the perception of various constructed realities, it is more vital for qualitative research to demonstrate that its findings are credible, transferable and conformable as follows:

- *Credibility* To certify the credibility, the researchers ensured that the literature used in the research were predominantly from peer-reviewed published articles.
- *Transferability* To ensure transferability, the researcher compared MAPs literature from different settings and continents.



- *Confirmability* An audit trail was left when the researchers discussed the details of the process of data collection, data analysis, and interpretation of the data.
- *Dependability* Other researchers have enough information to replicate the research and obtain similar findings.

## 4 Data analysis

Innovative MAPs provide management with information for internal solutions. The problem is how to identify specific innovative MAPs that manufacturing SMEs can integrate into their strategies to achieve sustainability. In this research, the researchers employed figures and tables to make conclusions meaningful to communicate and answer the main research question:

Which innovative MAPs can be integrated into manufacturing SMEs' strategy to achieve environmental and social sustainability?

To answer the main research question, the research sub-questions (RSQ) were answered next.

RSQ1: What are the traditional and innovative MAPs that manufacturing SMEs can integrate into their strategy?

To answer RSQ1, the data analysis identified traditional and innovative MAPs generally employed by manufacturing SMEs as depicted in Fig. 2.

The researchers have been able to identify MAPs from synthesised and reviewed articles and have categorised them into traditional and innovative MAPs as shown in Fig. 2 to simplify understanding.

RSQ2: Which innovative MAPs have environmental, social and sustainable development impacts on manufacturing SMEs' decision-making?

To answer RSQ2, the data analyses revealed that for manufacturing SMEs to cope with changes in time and modern technology, strategies have to be integrated with MAPs that provide management with all-round information to deal with enterprises' environmental and social impacts (Ghorbel, 2016), since innovative MAPs relate to providing solutions to management internally (Nuhu et al., 2016). Managing environmental impacts of enterprises involves the control of environmental and social effects of enterprises' actions and their effects on the ecosystem (ISO14004, 2016; Bebbington & Unerman, 2018). Ntalamia (2017:6) argues that to avoid manufacturing SMEs incurring high environmental and social costs, they may need to integrate innovative MAPs to reduce such costs. Though many innovative MAPs were identified in Fig. 3, the study considers innovative MAPs that may promote manufacturing SMEs' sustainability as MAPs which may impact the decision-making of SMEs regarding the environment, society and sustainable development. Hence, the innovative MAPs for sustainability are MAPs that can impact decision-making on the three (3) footprints of manufacturing SMEs' strategies as presented in Fig. 3.

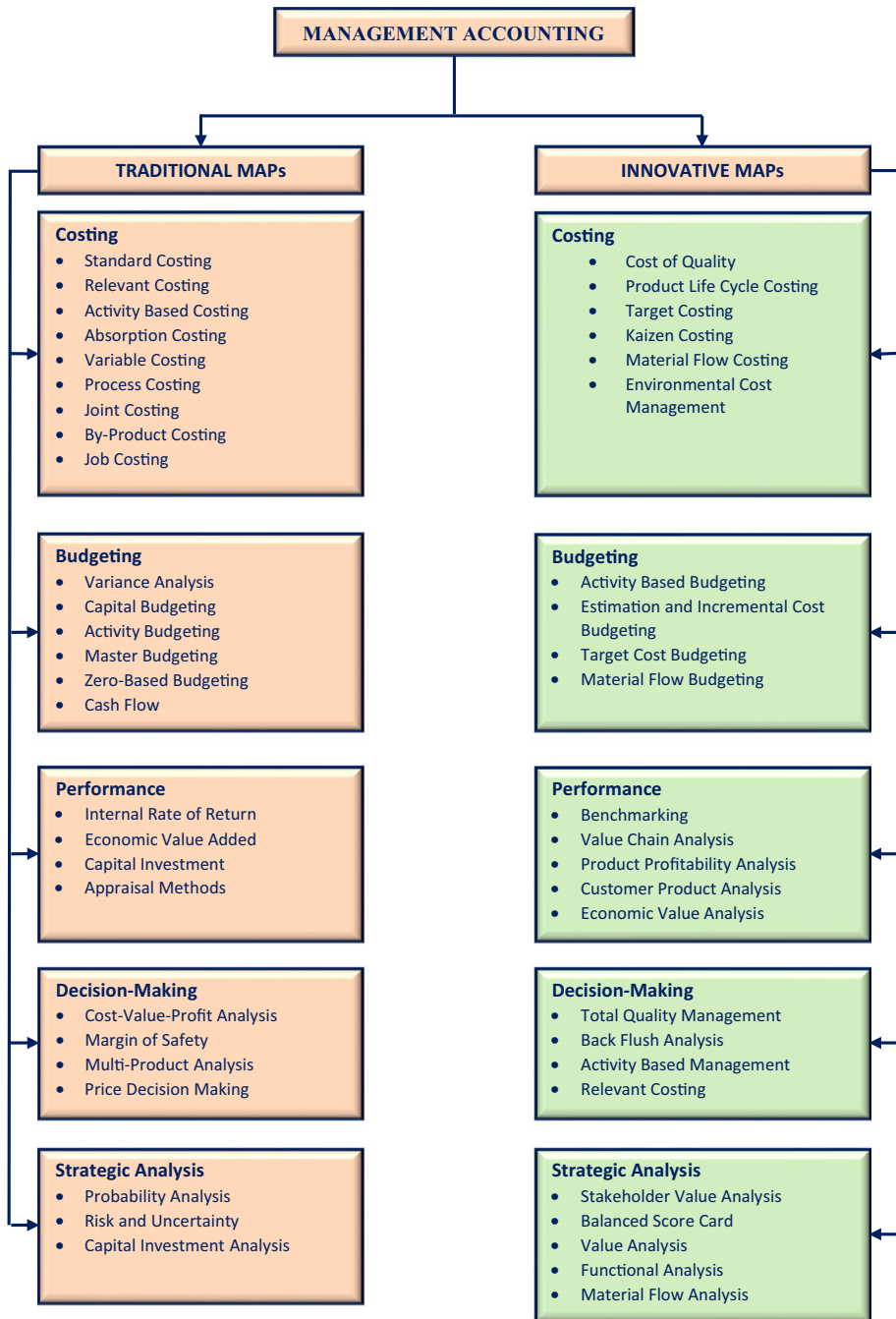
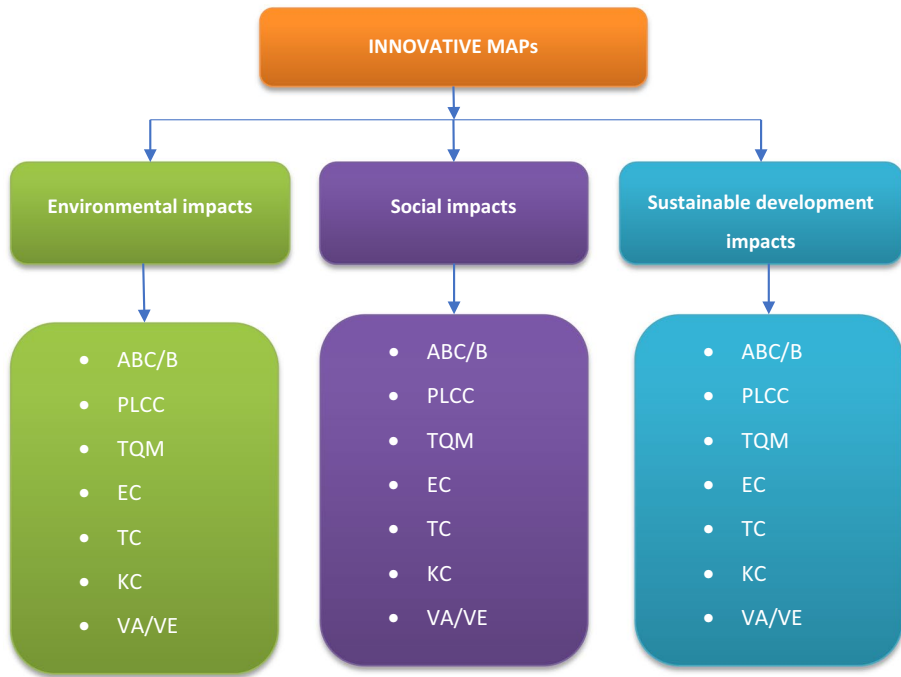


Fig. 2 Traditional and innovative MAPs (Authors' own)



**Fig. 3** Sustainability MAPs (Authors' own)

In Fig. 3 the data analysis has identified seven (7) innovative MAPs which cut across all three (3) footprints, namely:

- Activity base costing/budgeting (ABC/B)
- Product lifecycle costing (PLCC)
- Total quality management (TQM)
- Environmental costing (EC)
- Target costing (TC)
- Kaizen costing (KC)
- Value analysis (VA)

These seven (7) innovative MAPs will be discussed in the findings section.

## 5 Findings

To conclude this research, the innovative MAPs identified from the data analyses which may assist manufacturing SMEs to protect the environment and society when integrated into their strategies to achieve sustainability are therefore discussed next.

## 5.1 Activity-based costing/budgeting (ABC/B)

ABC/B focuses on managing the variety of activities that SMEs engage in. It is structured on the principles that activities consume costs. Consequently, by controlling activities, costs are controlled in the long-term (Dubihlela & Rundora, 2014; Mahal & Hossain, 2015). ABC/B aims to facilitate client approval whilst making a few changes to SMEs' resources. Ascertaining activity costs permit activities with a high cost to be identified and prioritised for a thorough study to determine if they can be performed more efficiently or eliminated (Drury, 2018; Tsai et al., 2010). The integration of ABC/B into manufacturing SMEs' strategy will allow management to:

- Identify major activities in the SME;
- Assign costs to each activity;
- Identify cost drivers for every main activity; and
- Allocate cost to each activity in accordance with the product's demand.

ABC/B may offer appropriate target areas to reduce environmental and social costs in product designing. Hence, manufacturing SMEs may allocate costs to processes and further activities using environmental data provided by ABC/B methods for decision-making on sustainability (Andersson et al., 2011). As a result, management might become efficient in identifying the real production costs and offer insights for improving on-going processes in manufacturing SMEs. Hence, ABC/B was identified as an innovative MAP that may assist SMEs to be sustainable.

## 5.2 Product life cycle costing (PLCC)

According to Biernacki (2015); Nucci et al. (2016) and Drury (2018) PLCC projects and calculates a product's cost cumulatively over its total life cycle to ascertain if the expected profit in the manufacturing stage will defray the costs incurred over the entire manufacturing stage. They furthermore maintain that the identified costs incurred over several stages of a product's life cycle may offer an understanding of the product's total costs accumulated in its life cycle. Accordingly, PLCC gives management an understanding of the magnitude of a cost structure by detecting areas in which a reduction strategy can be affected. Testa et al. (2011) argued that PLCC certifies that enterprises decision-making is centred on increasing awareness of the perspective problem in terms of costs on the environment and society at the product design phase. Furthermore, Arena and Azonne (2012) indicated that PLCC can facilitate sustainability through the integration of innovative MAPs such as TC, VA, PLCC and ABC which are powerful management tools that SMEs can use

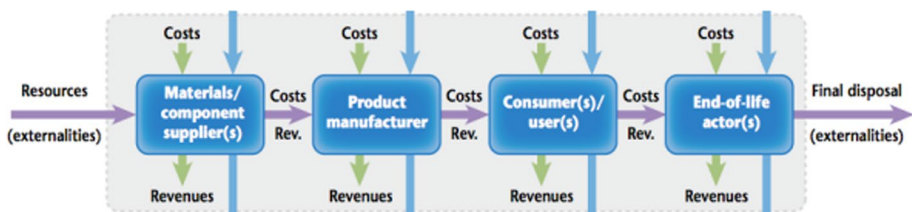


Fig. 4 Product life cycle cost and revenue tracking. Source: Rebitzer and Hunkeler (2003)

to overcome the challenges faced in implementing general sustainability standards. PLCC includes allocating costs and revenues on a product-by-product basis over various phases throughout the life cycle as depicted in Fig. 4.

Figure 4, shows that management can use PLCC as a practice to identify cost components in products which may impact negatively on the environment and society to be eliminated in subsequent product design stages before the cost is committed into production. Hence, the identification of PLCC as innovative MAPs for manufacturing SMEs sustainability.

### 5.3 Total quality management (TQM)

TQM is a method that permits manufacturing SMEs to estimate the degree to which its resources are employed in activities that prevent poor quality. These costs are grouped into three (3) categories: preventive, appraisal and failure cost. Its purpose is to attract management attention to prioritise quality standards (Barone, 2020). Drury (2018) argues that TQM is a tool that may assist management to compete effectively in the twenty-first century by making clients' satisfaction an overriding priority. TQM is a practice used by management accountants in the setup of an SME. It assists internal management to meet clients' demands and improves service levels regarding costs, quality, dependability, supply and high-quality in innovation.

It is plausible that the integration of TQM as an innovative MAP into manufacturing SMEs' strategies may assist managers to achieve quality goals through the provision of the under-listed reports as per Drury (2018):

- *Preventive costs* Assist to report on costs of prevention, maintenance, and quality planning, training and the additional cost of obtaining advanced quality materials. This will draw management's attention to devise strategies at the product design stage to reduce or eliminate such costs.
- *Appraisal costs* Assist to report on costs of checking materials, inventory-in-progress and completed inventory, audits and fields trials.
- *Internal failure costs* Assist to present an internal assessment report on materials or products that fail to meet quality standards. Hence, management will be able to establish costs that will be incurred on products' ratification before they are dispatched to clients such as re-work, cost of scraps, downtime and stoppages caused by defects.
- *External failure costs* Managers will be able to assess costs that will be incurred on products and materials dispatched to clients that have failed to meet quality standards. These costs may involve the cost of controlling a client's grievances, guarantee replacement, repairs of returns and cost of impaired enterprise image.

When these costs, which are components of TQM, are integrated into SMEs' strategies, it may generate reports that will support management to identify and control the above costs internally (Boca, 2011). TQM will provide management with information to determine the potential savings to be gained by implementing process improvement (Mohamad & Wahab, 2017; Sahoo & Yadav, 2018). This confirms the Sigma philosophy, which strives to achieve zero defects in the production process the first time rather than to rectify (Cuzdriorean, 2017). Hence, management will devise strategies to minimise these costs to the best possible level or eliminate them entirely during products' design stages to increase manufacturing SMEs' sustainability.

## 5.4 Environmental costing (EC)

Environmental costing (EC) is a method of determining costs linked to the real or prospective depletion of natural assets owing to economic undertakings of an enterprise. EC ensures that SMEs' resources, processes, obligation, planning activities and structures are developed to implement, attain, appraise, and maintain environmental strategies. The data analyses uncovered that SMEs have challenges to integrate the right innovative MAPs into their strategy to assist them to track environmental costs to facilitate decision-making (Ntalamia, 2017). Moreover, Drury (2018) argues that environmental costs are accrued in different cost pools, analysed into suitable classifications and traced to the products that caused the cost with the help of ABC no matter the size of the SME. Such knowledge may assist management accountants to categorise environmental costs and their causes. It may also provide management with information needed to manage such costs effectively through process designs to reduce pollutants emitted into the environment. Manufacturing SMEs with their scarce resources might integrate EC into their strategies to assist them identify and manage environmental costs through the following techniques (Drury, 2018):

- *Environmental prevention cost* It is a strategic tool used to avert waste that may cause or impair the environment at the product design stages. This may comprise costs connected to product design and operational routes to minimise pollutants, products recycling and gain accreditation relating to national and international environmental standards.
- *Environmental detection cost* It is used to trace products, activities and procedures that do not adapt to controlling laws and standards at the product's design stages. This may assist managers to inspect manufacturing products and procedures to ensure environmental compliance, audits and tests.
- *Environmental internal failure costs* It is a practice used to identify costs incurred from executing activities that may produce containments and waste discharges into the environment. These are costs incurred by rectifying or minimising waste which do not comply with controlling laws and are brought to management's attention for decision-making during the product design stages.
- *Environmental external failure costs* It is a cost incurred on the activities after discharge of waste into the environment. These are costs of renovating contaminated soil, land restoration, oil spills, and waste discharged clean-up costs that are brought to management's attention for decision-making during the product's design. Management could, therefore, establish measures at the manufacturing design stage to reduce or eliminate such a cost entirely.

With the integration of EC into manufacturing SMEs' strategies, society may be assured that negative environmental impacts of SMEs could be minimised or eliminated entirely in the manufacturing SMEs' sector.

## 5.5 Target costing (TC)

Target costing is a practice that assists enterprises' management to estimate a target price, production costs and the expected margins for a new product (Hendricks, 2015). Where such manufacturing projections cannot be achieved, management may cancel the designing of the product entirely (Romanova et al., 2017; Volker, 2015). According to Drury (2018), the prime

aim of TC is to support management to employ practical cost planning and management by integrating cost reduction strategies during the product design and development cycle.

The principles of TC are:

- Price led costing;
- Cross purpose teams;
- Client emphasis;
- Emphasis on products design;
- Life cycle cost minimisation; and
- Value chain investment appraisal.

The integration of TC into manufacturing SMEs' strategy may ensure inclusive cost planning, management and control principles are integrated at the primary stages of product design in order to impact cost structures for sustainability.

### 5.6 Kaizen costing (KC)

Kaizen costing (KC) is a method that can be integrated into the manufacturing stage of PLCC (Drury, 2018). The purpose of KC in MA is to achieve cost reduction primarily through increased efficiency in production. The possible cost reduction takes place, one slight pace at a time, to solve precise problems since these products are already in the manufacturing phases of the life cycle. Hence, a significant amount of cost has been locked in.

The real power of KC is to create a small amount of perfection repeatedly in the processes or reduce waste (Romanova et al., 2017). As a result, KC depends on employee empowerment as they are presumed to have more information on the product and the best way out to increase its efficiency in the production line (Romanova et al., 2017). The philosophy of KC creates a culture that places more importance on the working environment as an actual place of improvement and a source of evidence concerning the improvement of the enterprises (Mind Tools, 2018).

According to Boca (2011), when enterprise management is thinking of going green, KC is one of the innovative MAPs that can be employed to promote enterprises' environmental friendliness. Hence, manufacturing SMEs may stand a chance of achieving environmental and social sustainability when integrating it into their strategy.

### 5.7 Value analysis (VA)

Value analysis is a method that applies a systematic, inter-disciplinary valuation of causes that affect production costs in order to devise appropriate ways of realising the exact activity most economically at the prerequisite quality (Ismail et al., 2010). The benefit of VA aims at a specific product or process to increase efficiency in managing projects by resolving problems, encourage innovations and improve communication across the SME (Drury, 2018). VA also enables people's contribution to the value-added process by continuously focusing on products design and services. Finally, VA provides risk reduction and continuous improvement of SMEs (Ismail et al., 2010). To achieve the above, VA undertakes activities such as cost analysis of products' functions and evaluates alternatives. Secondly, VA recommends to management issues that may facilitate environmental and social protection in product design for manufacturing SMEs (Ramli et al., 2013). Hence, integration of this innovative MAP into manufacturing SMEs' strategy may assist to strive towards environmental and social sustainability.



## 6 Conclusion

To address the problem of this research, the systematic literature review discovered that manufacturing SMEs exert considerable pressure on the environment and society through their collective impact of smaller activities (Wangombe, 2013). These impacts could be traced and controlled by using innovative MAPs as a strategic tool which may provide precise information to advance manufacturing SMEs' social and environmental disclosure on its performance to promote their sustainability. The summary of the findings is presented in Fig. 5 to show the identified innovative MAPs, how they may impact manufacturing SMEs strategic policies and operations to promote their sustainability.

From Fig. 5, the research concludes that innovative MAPs will enable manufacturing SMEs to protect the environment and society through integrating sound environmental; health and safety; supply chain management and recycling policies that may enhance their operational efficiency and subsequently promote their achievement of economic sustainability in the long run.

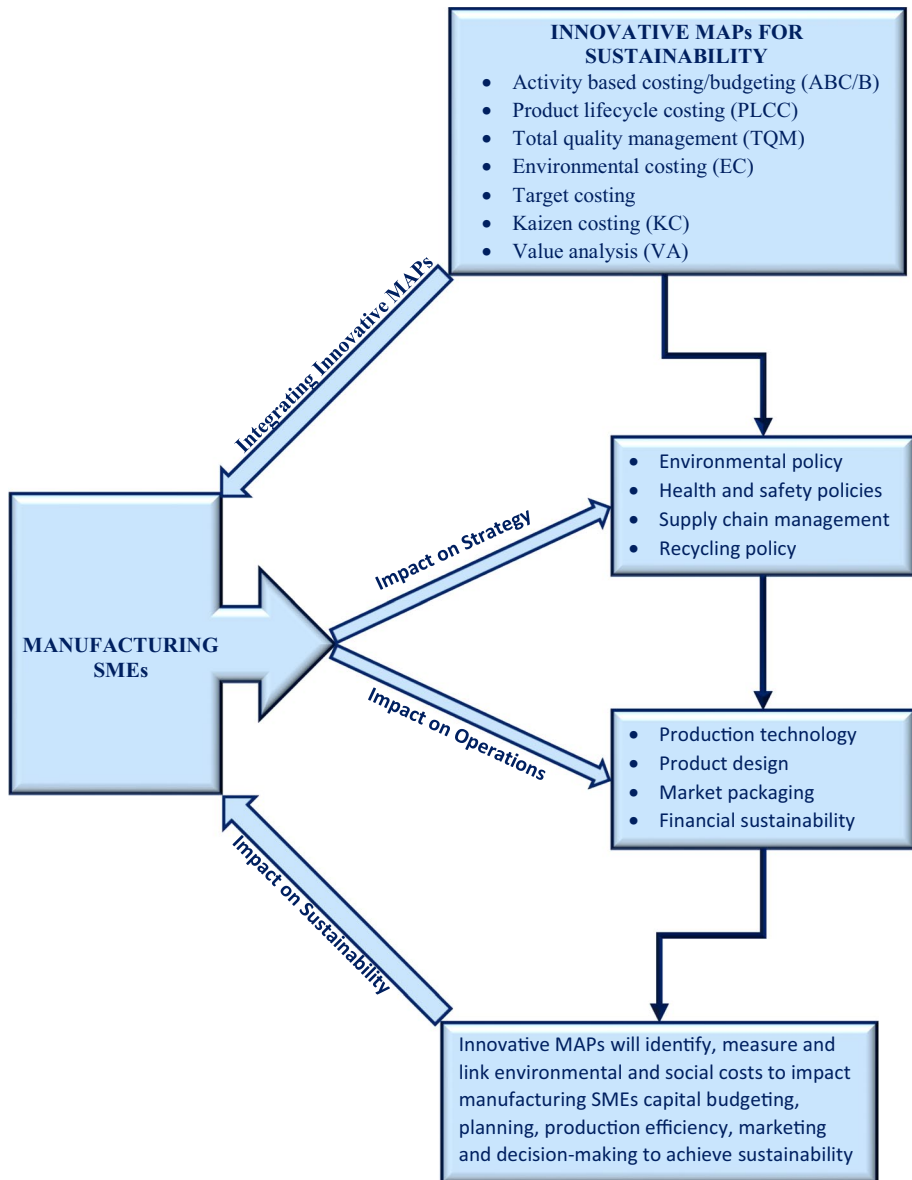
The research has also contributed to:

- Creating internal and external awareness on the complex environment in which manufacturing SMEs' operate, and the need to consult them when enacting policies that may impact the sector.
- Educating manufacturing SMEs on available innovative MAPs that can be integrated into their strategy to achieve environmental and social sustainability in the economy;
- Breaching the existing gap between theory and practice by identifying seven (7) innovative MAPs that manufacturing SMEs can integrate into their strategies to achieve sustainability, and
- Add to the extant literature of management accounting.

The research had the following limitations:

- A limitation of a qualitative research approach to data analyses is that findings cannot be extended to the broader population and its equivalent degree of conviction compared to quantitative. It is because the findings of this research are not tested to ascertain whether they are statistically significant or due to chance.
- The research focused on manufacturing SMEs only and is not open to analyses of the whole SME sector, hence the findings cannot be generalised to cover the whole SMEs sector.
- The research seeks to identify only innovative MAPs that can promote manufacturing SMEs sustainability considering environmental and social impacts in decision-making with regard to economic challenges.

The above limitations notwithstanding, it is believed that this research has resulted in insights for scholars and practitioners. It is hoped that this research will also inspire further research in the discipline of management accounting to identify factors; strategic procedures; and the environmental and social benefits of integrating these identified innovative MAPs into manufacturing SMEs to achieve sustainability.



**Fig. 5** Innovative MAPs impacting manufacturing SMEs policies and operations for sustainability

## Appendix

See Table 1.

**Table 1** Management accounting practices

Author (Year)	Summary (regarding the focal MAPs)	Fieldwork (Country)
1 Ahmad (2017)	Integration of innovative MAPs (ABC, TC and SMA) in SMEs is lower compared to large enterprises. MAPs integration has a significant influence on SMEs operations and re-enforced the significance of MAPs integration in today's enterprises. Discovered that medium enterprises mostly integrate innovative MAPs compared to small enterprises. Hence, medium enterprises are observed to be sustainable compared to small enterprises	Malaysia
2 Ahmad and Leftesi (2014)	Manufacturing enterprises in Libya rely on traditional MAPs compared to the innovative MAPs. Indicates MAPs are still integrated at level one and two of IFAC-based model. Implying most Libyan manufacturing enterprises integrate MAPs that provide data on cost determination and financial control management for decision-making	Libya
3 Ahmad and Zabri (2016)	Traditional MAPs were more integrated by SMEs in Malaysian compared to innovative MAPs. MAPs were mostly used for monetary than non-monetary performance measures. Higher acceptance of traditional MAPs was attributed to the fact that they provide easily understandable information compared to the innovation MAPs. SMEs managers are sceptical about its cost of implementation compared to its benefits	Malaysia
4 Albelda (2011)	Explore the role of MAPs as facilitators of environmental management. MAPs operate as a facilitator reinforcing the four significant elements of EMA: commitment to continual improvement of the environmental performance; compliance with environmental legislation; communication with interested parties; and employee involvement	West Indies
5 Alleyne and Weekes-Marshall (2017)	MAPs assist management to obtain relevant information to facilitate the decision-making process in Barbados manufacturing SMEs. It assists to reduce social and environmental cost during product design stages and promotes enterprise efficiency which leads to sustainability	
6 Alsayegh (2020)	Critical literature review of activity-based costing around the world covering articles from developed and developing countries and is organised to provide insights on four major aspects of ABC adoption, implementation, outcomes and criticism. Many companies fail to implement ABC due to culture and organisational issues	Global
7 Amara and Benelifa (2017)	Accounting plays a significant role in enterprises' decision-making. Accounting assists management to portray enterprises contingency factors such as enterprise strategy, environmental risk, new technology and strategic planning. Internal and external factors are the pre-determined type of MAPs to be adopted by management. In Tunisia, external factors do not predict the level of MAPs integrated into enterprises but similar factors like size, resources, technical skills of management determine the level of MAPs integration	Tunisia

**Table 1** (continued)

Author (Year)	Summary (regarding the focal MAPs)	Fieldwork (Country)
8 Andersson et al. (2011)	Evaluated the use of ABC in a DES environment. Discovered that using ABC has lower implementation cost compared to LCA and DES. To make the LCA analysis comparable to ABC in a DES system the same data must be used. However, major differences exist in the database and in the variants of material used in the study. Established that an ABC approach for environmental impact analysis is feasible. It is therefore synergistic with calculating a product's price but does not improve the speed of implementing environmental impact analysis in the enterprise. Comparing the static LCA approach, it is likely to analyse the vibrant effects in production. As new products and methods are introduced, dynamic effects that are hard to analyse using a static LCA tool can be undertaken with an ABC approach	USA
9 Annandale (2013)	Integrating a sustainability strategy can make SMEs more economical in the supply chain. Integrating innovative MAPs into SMEs will unlock the benefits of sustainable practices and adherence to international acceptance. Sustainability enables SMEs to take a long-term stand on managing environmental and social risks to achieve important growth and cost savings. It also improves brand and reputation, strengthens stakeholder's relations, and boosts their bottom line. Finally, SMEs that employ innovative MAPs may better understand their impact of systemic risk and resource constraints of business operations which results in their sustainability	South Africa
10 Arena and Azzone (2012)	To integrate sustainability into SMEs, specific sustainability indicators should be developed to suit SMEs characteristics. This can be facilitated through the integration of innovative MAPs such as (TC, VE, LCC and ABC) which are powerful management tools that SMEs can use to overcome the challenges faced in implementing general sustainability standards. Integrating innovative MAPs in SMEs will be a key to identify sustainability indicators	Italy
11 Azudin and Mansor (2017)	MAPs provide various tools and important data that facilitates budgeting, planning and evaluation. MAPs guide and shape the internal data system. MAPs are not standardised and therefore varies from one economy to another	Malaysia
12 Bebbington and Unerman (2018)	Accounting as a technology used in estimating, evaluating and reporting within the structures of UN SDG. Literature perceives accounting to play a significant role in connecting SDG and practical work with enterprises management. Innovative MAPs can address enterprises environmental, social and sustainable development problems to promote UN SDG in enterprises decision-making. Concluded that the new way of evaluating and theorising SDGs in enterprises is to integrate innovative MAPs	UK

**Table 1** (continued)

Author (Year)	Summary (regarding the focal MAPs)	Fieldwork (Country)
13 Biernacki (2015)	ELCC deals with the collection of total costs connected with a product's life cycle. It introduces environmental and social cost into cost computation at the designing of the product. ELCC assists enterprises to sum up costs suffered at the time of designing, building, transporting, until the end stockpiling, market demand and recycling	N/A
14 Boca (2011)	Using Kaizen Costing (KC), enterprises not only reduce waste but also increase productivity at lower costs and energises employees as well. KC is an effective technique to create change in a manufacturing strategy. Continuous improvement and achieves fundamental principles characterised by value engineering: (i.e. minimising waste defects and high-quality control procedures at all phases, quality assurance, leadership, low costs and supply manufacturing)	Romania
15 Cuzdriorean (2017)	Few SMEs managers integrate MAPs in management decision-making, and they are mostly familiar with traditional MAPs compared to innovative MAPs. Innovative MAPs are only discussed in literature and textbooks in Romania. The few Romanian SMEs integrate innovative MAPs for the purpose of brand valuing, strategic costing, KC, stakeholder value creation and value analysis. SMEs management fail to integrate innovative MAPs due to a lack of information and the high cost of implementation	Romanian
16 Dubihlela and Rundora (2014)	SME owners and administrators can effectively advance their cost performances by employing ABC. Ultimately, effective SMEs cost activity is expected to make more profit for SMEs and can improve their survival in predominant difficult economic situations. ABC integration positively impacts the cost of SMEs performance. It assists SMEs to adjust their structures to improve management skills to achieve efficiency and sustainability. An effective integrated ABC system brings change in SMEs culture and new skills are acquired by employees and management of SMEs to enhance their sustainability	South Africa
17 Ghorbel (2016)	A manager's profile has a relationship with MAPs integration in manufacturing SMEs. Manager's age and MAPs integration have no relationship. Managers educational background, skills and industrial experience has a significant relationship on types of MAPs to be integrated. SMEs in Tunisia have been integrating MAPs despite their limitation. For manufacturing SMEs to benefit from MAPs, they may need to understand innovative MAPs and integrate those tailored to suit their system of operation	Tunisia

**Table 1** (continued)

Author (Year)	Summary (regarding the focal MAPs)	Fieldwork (Country)
18 Hamann et al. (2017)	The manager's perceptions are mostly drivers of environmental impact. Their knowledge of the environmental impacts influences management strategy and culture. Legitimacy influences enterprises' societal role where statutory legislations' drivers are absent. Proactive enterprises may be characterising expectation and competitiveness. The constitutional setting and possible interference drive explanations as to why SMEs participate in pro-environmental activities in developing economies	South Africa
19 Hendricks (2015)	TC principles are useful for several purposes such as design eco-friendly products and processes, improve the efficiency of operations and as part of a comprehensive business strategy. By adopting TC principles, enterprises are able to factor in both cost and environmental measures into decision-making, and management can strengthen enterprises positioning now and in the future	CPA – Canada
20 Jalaludin et al. (2011)	Explains the relationship between institutional pressure and environmental management accounting (EMA) adoption. The interviewed accountants agreed that they were pressured by their customers, shareholders, head office and the government in terms of environmental performance—company policy influence their MAPs, including EMA adoption	Malaysia
21 Jamil et al. (2015)	Urge accounting professionals to be involved in promoting EMAPs in SMEs. They argue that integrating environmental issues into accounting demands enterprises learning strategies. With increased pressure, from the government, and legislative instruments, manufacturing SMEs are willing to integrate EMA to bring change and adopt legitimacy. Financial constraints, insufficient environmental knowledge, and skills were also seen to be a barrier to the integration of EMAPs in manufacturing SMEs. Authorities were urged to come up with tax policies that will motivate MAPs' integration by manufacturing SMEs in Malaysia	Malaysia
22 Johnson and Schaltegger (2016)	Effort to structure specific MAPs for SMEs have been achieved, however, general MAPs have been innovated to make its integration easy in SMEs strategy. Collaborate with SMEs to join forces to handle sustainability challenges in the economy and integrating their extensive knowledge and thoughts on uniqueness and complications of SMEs. Researchers with a strong focus on SMEs can balance the existing literature on sustainability management tools to suit SMEs	Germany
23 Lemus (2016)	The CSR guideline takes position in small enterprises compared to medium and larger enterprises. CSR is comprehended as the worldwide enterprise practice which ensures social benefits to SMEs in the international arena. The environmental, social, and economic areas are the three pillars of sustainability. The TBL shall be acknowledged as an integrated report. The integration of CSR in management accounts has the capacity to improve the data quality sent to shareholders	United States

**Table 1** (continued)

Author (Year)	Summary (regarding the focal MAPs)	Fieldwork (Country)
24 Le et al. (2018)	SMEs in Vietnam play a significant role in the economy. SMEs management lacks the necessary knowledge and skills in innovative MAPs. MAPs are being employed in decision-making structures to offer management with the right economic data. Even though some managers may see the necessity for integrating MAPs into their strategy, most avoid it because of fear of it bringing an additional cost to the enterprises operating cost	Vietnam
25 López and Hiebl (2015)	SMEs integrate MAPs differently compared to large enterprises and most managers in SMEs do not actually understand MAPs. A lack of environmental and social staff and enterprises structural factors influence MAPs integration in SMEs and their sustainability benefits. The need for accounting professionals to establish educative programmes on MAPs integration processes in SMEs in higher institutions of learning	USA
26 Lucas et al. (2013)	The study revealed that SMEs use MAPs as follows: with Small enterprises (product costing, budget & working capital management) fully and slightly use MAPs for (budgeting, CVP analysis and responsibility accounting). For medium enterprises, the study observed that all MAPs mentioned above are fully used in their strategies	UK
27 Lynch-Wood and Williamson (2014)	Regulation is important in all probabilities that drives behaviour. SMEs are most unlikely to embrace environmental practices or react to self-regulatory instruments. Regulatory agencies need to be careful when designing programmes and regulations so as not to promote their benefits. Understanding SMEs reaction to EMS needs a serious reflection on SMEs ability and alignment. This mixture permits us to predict enterprises with various regulatory access capacities, everywhere accessible capacity can be considered as creating a regulatory and compliance philosophy	UK
28 Mahal and Hossain (2015)	Innovative MAPs have been accepted in the twenty-first century as a management tool for effective decision-making and therefore has changed the traditional concepts of management accounting in enterprises. ABC measures the cost of production accurately and promotes accurate overheads cost allocation which leads to fewer distortions and acts as evaluation tools in MA	Bangladesh
29 Mat et al. (2018)	SMEs play a significant role in the economy and may need to integrate technology such as innovative MAPs and computerised inventory management system. SMEs face challenges in securing financial resources to build capacity. The 21 <sup>st</sup> -century economy demands SMEs to be sustainable, integrate technology and appropriate innovative MAPs to provide them with the right mix of data to support management decision-making	Malaysia



**Table 1** (continued)

Author (Year)	Summary (regarding the focal MAPs)	Fieldwork (Country)
30 Matambele and van der Poll (2017)	MAPs are important tools to provide sustainability data for decision-making and ensures accurate measures of sustainability. Management is urged to integrate data generated by MAPs for effective decision-making. Managers who lack knowledge in MAPs pose a challenge and fear to consult accountant's advice in decision-making	South Africa
31 Maziriri and Mapuranga (2017)	MAPs such as costing, budgeting, performance analysis, data for decision-making and strategies instrumentally impact SMEs performance in Gauteng. SMEs that integrate innovative MAPs into their strategies enhance their performance compared to the others that don't integrate innovative MAPs	South Africa
32 Mohamad and Wahab (2017)	SMEs are major contributors to social and economic development and drive's economic advancement in emerging economies. MAPs play a strategic role to position SMEs as drivers of economic growth in the economy. Traditional MAPs were mostly applied in SMEs strategy in spite of its critics in Malaysia. A gap in knowledge on the role of MAPs in SMEs decision-making exist in literature. MAPs were identified to be playing the role of monitoring, forecasting, decision-making, and performance appraisal in SMEs and are perceived to promote the formulation and implementation of SMEs strategies and creates sustainable value	Libya
33 Nair and Nian (2017)	The integration of innovative MAPs is affected by enterprises' size and technology use in management strategy. Production designers, engineers and financial managers should work to ensure that appropriate sustainability strategies are integrated into the enterprise. SMEs may benefit from innovative MAPs just like large enterprises	Malaysia
34 Namakonzi and Inanga (2014)	Established manufacturing enterprise's impact the environment since a great quantity of material, energy and water are utilised by these enterprises. Manufacturing enterprises in Uganda have taken steps to enhance effective environmental management through EMAPs. Enterprises face various challenges such as splitting, identifying, categorising, assessing and regulating environmental costs. Other challenges are accessibility to environmental management technology, training and legislation	Uganda
35 Ndwiga and van der Poll (2013)	Provide insights into the role of management accounting in creating and sustaining a competitive advantage especially in the banking industry. MAPs provide both internal and external competitive strategies that enable business organisations to create and sustain a competitive advantage	Kenya

**Table 1** (continued)

	Author (Year)	Summary (regarding the focal MAPs)	Fieldwork (Country)
36	Ntalamia (2017)	Manufacturing enterprises incur higher environmental costs and as a result, they have an incentive to look for production processes such as lean accounting and EMA that may reduce environmental expenditures. Investing in cleaner modes of production, the enterprise is able to improve and stay ahead of the competition. The capabilities of an enterprise to innovate and discover new methods or technologies for greener production establish an enterprise's competitiveness in the long run	Kenya
37	Nucci et al. (2016)	The study revealed that LCC is a powerful instrument used by enterprises and institutions for different purposes, such as procurement, design, cost monitoring and estimation for environmental protection. LCC considers the environmental externalities of the product under design and its life cycle as well as determine its monetary value and sustainability	Italy
38	Nuhu et al. (2016)	Traditional MAPs are predominant management practices employed in Australia aside from the escalation in the use of advanced activities established by public sector changes, the sector continues to lag behind. The study analyses data on MAPs as a package, and its contribution to literature by solving the discrepancy of reports in prior studies which evaluate variations reported in MAPs innovations	Australia
39	Olalekan and Jumo (2017)	EMAPs usage in South Africa are higher compared to Nigeria. EMAPs in Nigeria are barred by institutional barriers (government policy) while those of South Africa is caused by financial barriers	Nigeria and South Africa
40	Ojua (2016)	Employing SMAPs in Nigerian manufacturing enterprises is very slow and the lack knowledge about its practices. Benefits accruing to enterprises that adopt the principles is absent in the enterprises reviewed. Broadening of the limited based knowledge on SMAPs through training and its introduction in institutions of higher learning to educate students are needed	Nigeria
41	Ramljak and Rogošić (2012)	Provide insight into strategic management accounting practices (SMAPs) and their implications on relevance and timeliness of information used managers. To obtain their market share or profit margin companies need more sophisticated MAPs. Strategic management accounting becomes strong support in decision-making and the guide to the future changes	Croatia
42	Ramli and Ismail (2013)	EMAPs enable enterprises in Malaysia to attain economic benefits and advance their performance. Enterprise's need to integrate EMAPs to aggressively affirm their role as accountable social actors in society and therefore observing environmental issues are vital to measuring their routine strategies which motivate enterprises to strive towards environmental accountability. Most manufacturing enterprises that adopt EMAPs benefits greatly and may benefit greatly and promote their sustainability	Malaysia

**Table 1** (continued)

Author (Year)	Summary (regarding the focal MAPs)	Fieldwork (Country)
43 Ramlı et al. (2013)	VE helps enterprises to identify and eliminate unnecessary cost that may impact negatively on the environment and society which necessitates the function of least costs of the product's output. VE also supports enterprises to identify the main issues and resolving them at the designing stage in products, projects and services before the cost is committed by management to production. VE is used by enterprises as a tool to improve their social system	Malaysia
44 Ratnatunga et al. (2015)	Findings indicate that MAPs play an important role in decision-making in Australia. However, the industry lack professionals in costing, CSR, carbon accounting, risk management, analyst, and asset management	Australia
45 Romanova et al. (2017)	The study identifies that target costing provides management with objectives characterise by optimising price and quality ratios to performing functions with low operating cost. TC assists management to accomplish product design in time and in accordance with the specifications. TC balances the costs of product's elements so that allocated amounts allow implementation of the planned activities to ensure compliance with standards and functions of society. Finally, TC ensures that products cost does not exceed the budgeted manufacturing cost	Russia
46 Rufino (2014)	The study discovered most manufacturing SMEs are utilising traditional MAPs compared to innovative MAPs to assist managers internally in decision-making. Furthermore, the study identified 22 MAPs of which 13 MAPs were adopted and integrated by manufacturing SMEs into their strategies to monitor and evaluate their performance and profitability. Integration of such MAPs also helps them to ensure continues upgrading in quality of products and services which lead to sustainable profitability	Tarlac
47 Sahoo and Yadav (2018)	Identifies a positive link between total quality management (TQM) and enterprise performance. As a result, managers of manufacturing SMEs need to recognise the role of TQM in decision-making and how they can effectively be integrated into decision-making processes	India
48 Sharma (2015)	Findings show many SMEs in Nepal perceived MAPs to be an important tool in decision-making compared to financial accounting reports. In relation to accounting reporting, MA reports are well-thought-out to be more suitable than financial accounting reports	Nepal

**Table 1** (continued)

Author (Year)	Summary (regarding the focal MAPs)	Fieldwork (Country)
49 Shields and Shelleman (2015)	The study has use sustainability SWOT to determine the enterprises' strength and weakness environmentally, socially and economically. Also using the SWOT matrix to determine internal and external capabilities. The matrix enables sustainability matters to be integrated into the rest of SMEs strategic planning to ensure clarity in budgetary, resource allocation and tracking performance to promote sustainability	N/A
50 Sterling (2016)	Findings argue that to accomplish the goal of working towards a profound transformation awareness which reconciles people and planet in SDG, the role of education is more important and all-inclusive than is documented in the SDGs guideline. Hence it is possible to address its application. The scholar argues that education demands re-invention and re-focusing to assume the obligation these challenges require and to advance the agency that is needed for revolutionary progress to be made	London, New Delhi
51 Stubblefield et al. (2010)	Different MAPs need to be developed to provide sustainability in SMEs since their resources and profiles are different compared to large enterprises. The scale of diversity and characteristics that exist in SMEs should be taken into consideration when developing MAPs to ease its implementation and benchmarking. The major reason for SMEs to adopt innovative MAPs is not the leading edge, but because the planet matters to them as an enterprise. Hence innovative MAPs will facilitate their protection and sustainability	Canada
52 Sunarni (2013)	The rapid changing of business environment lately is significantly changing the MAPs and the role of management accountant in an organisation. Management accounting should move from administrative level to the strategic ones, from "bean counters" to "business partners". Budgeting was considered the most important managerial tool in MAPs for both medium and big-scale enterprises. The MAPs' focus was still on traditional perspectives	Italy
53 Testa et al. (2011)	LCC is an integrated method that assists management in handling the whole PLC and services by integrating further sustainable practices of manufacture and consumption. LCC certifies that enterprises decision-making is centred on increasing awareness of the perspective problem in terms of costs on the environment and society at product design	Taiwan
54 Tsai et al. (2010)	Integrating of ABC, the effects of environmental costs are more implicit, unlike the traditional cost technique. Enterprise managers should establish ECA to assign environmental costs using ABC to cost products, services and consumers to attain green affordability	Austral

**Table 1** (continued)

Author (Year)	Summary (regarding the focal MAPs)	Fieldwork (Country)
55 Tuzek et al. (2018)	Different voluntary standards integration in large and SMEs systematic theory and gaps in the discipline. These areas are identified in different spheres such as purchasing, logistics, strategies, critical evaluation of theories to assist management forward looking to achieving sustainability	Turkey
56 Uyar (2010)	SMEs in Turkey mostly use MAPs in three (3) overhead allocation centres; i.e. prime costing; units and labour costing. Pricing decisions are significant where cost data are applied. Manufacturing SMEs regard traditional MAPs to be more useful compared to innovative MAPs	Germany
57 Volker (2015)	Target costing is used to support enterprises in the logistics industry to protect the environment and society. TC is used to structure logistics pricing, delivery time and the mode of delivery. In pricing and mode of delivery decision-making, environmental and social impacts are factored in, to ensure that price is within affordability of customers and mode of delivery minimises the pollution impact on the environment and society	Thailand
58 Vu and Buranatrakul (2018)	Pressure for enterprises to integrate social issues in their decision-making. Aligns with legitimacy theory to expose enterprises to public and political scrutiny concerning eco-greening. Enterprises are to integrate appropriate innovative MAPs that will address social and environmental issues in management decision-making in Vietnam. Enterprises may be able to show justification for adapting regulatory regime changes swerving over the globe for sustainability	Various countries
59 Wouters et al. (2016)	Overview of research published in the innovation and operations management on 15 methods of cost management in new product development. The top three methods are: modular design, component communality and product platforms whereas target costing was the most used practice in management accounting	
60 Msomi et al (2020)	Manufacturing SMEs managers are clearly aware of strategic impacts and benefits of integrating contemporary MAPs as an innovative strategy for sustainability but due to economic challenges associated with its integration, they opt for traditional MAPs	South Africa

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