

# Incorporating the environmental dimension into the balanced scorecard

## A case study in health care

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### Abstract

**Purpose** – This study aims to explore the ways that the balanced scorecard (BSC) can be adapted to incorporate environmental performance in a health care context.

**Design/methodology/approach** – This research adopts a qualitative approach that uses an in-depth case study including semi-structured interviews and document review. Interviews are conducted with individuals working within a regional public hospital and health service organisation in Australia. The research is informed by stakeholder theory.

**Findings** – The participants identified a number of approaches to incorporating environmental dimensions within the BSC: fully integrated, partially integrated, a separate additional perspective and differentiation based on the origin of the environmental activities and events. These findings confirm the contingent nature of the selected model and reinforce the importance of organisational vision and environmental strategy as formative factors.

**Research limitations/implications** – This research provides a starting point for future research to refine the proposed models and evaluate their viability and relevance in other contexts.

**Practical implications** – This study provides motivations for managers to engage with the BSC as an effective performance measurement system, which can be developed and adapted to incorporate important environmental elements of organisational performance.

**Social implications** – This study reveals the importance of difference between endogenous and exogenous environmental activities. As concerns around the environmental consequences of organisational activities continue to grow, opportunities for institutions to reassure stakeholders of their sustainable practices are increasingly critical.

**Originality/value** – This study presents preliminary evidence on the suitability of various models for integrating environmental dimensions within the BSC. The findings provide a valuable contribution to literature on performance measurement systems in the healthcare sector.



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## Introduction

The healthcare industry affects all of the society, and it is now increasingly important because of an ageing community (Mavlutova and Babauska, 2013). From an economic perspective, the healthcare industries' fundamental role is to deliver social outcomes (Soysa *et al.*, 2016). As organisations in this sector provide services continually, this creates the potential for large amounts of energy consumption, greenhouse gas emissions, carbon dioxide emissions and waste disposal relative to other industries (Shapiro *et al.*, 2000; Blass *et al.*, 2017). For instance, US healthcare facilities produce about 6,700 tonnes of waste each day (Zimmer and McKinley, 2008). These same organisations generate a substantial degree of US carbon dioxide emissions and greenhouse gas emissions (Kaplan *et al.*, 2012). These emissions produced by healthcare providers represent 8 per cent of total US greenhouse gas and 7 per cent carbon dioxide emissions (Chung and Meltzer, 2009). In the Australian context, Victorian public healthcare providers are classified as the second largest emitter of greenhouse gas emissions, which contribute 20 per cent of public sector emissions in Australia (Victorian Auditor-General's Office, 2012). As a result, such organisations are implicated in causing negative environmental outcomes in relation to air quality, water, natural resources and human health.

Healthcare organisations are responsible for their environmental activities to a broad range of stakeholders (Hoque, 2006) and Australian hospitals are under pressure to reduce, manage and monitor their environmental activities (Naylor and Appleby, 2012). Consequently, Australian public sector organisations have become increasingly conscious of the need to improve their environmental performance (Adams *et al.*, 2014). The act of properly identifying stakeholders is considered a starting point to designing the performance measurement system (Neely *et al.*, 2002). For this reason, Kaplan and Norton's BSC performance measurement system is based around the stakeholder theory (Kaplan and Norton, 1992). This theory evaluates organisational performance against the expectations of the various stakeholders (e.g. shareholders, employees, customers, suppliers, governments and communities) that have interest in the organisation's activities (Hubbard, 2009). However, although the BSC is a viable mechanism to monitor hospitals' performance, the original four perspectives (financial, customer, internal business processes and learning and growth) do not explicitly include measures for environmental activities.

Managers require relevant and reliable environmental information to inform and support their decisions (Burritt *et al.*, 2010). This need for relevant and reliable environmental information requires the use of accounting tools that support organisational managers in understanding and monitoring environmental activities (Christ and Burritt, 2013). The aim of using these accounting tools is to provide a clear picture about organisational performance and reporting for all stakeholders (Hoque, 2006). As stakeholder theory provides a multi-dimensional approach for organisation performance measurement (Kaplan, 2008), many sustainable balanced scorecard (SBSC) scholars have based their studies on the stakeholder theory (Hubbard, 2009; Hansen and Schaltegger, 2016). This study builds on this research by explicitly recognising that stakeholder demands influence the design of performance measurement systems and this effect is emphasised in the context of health care.

Limited empirical studies have been conducted to examine ways that the environmental dimension may be comprehensively incorporated into the BSC (Lämsiluoto and Järvenpää, 2008, 2010; Van der Woerd and van Den Brink, 2004; Dias-Sardinha and Reijnders, 2005; Dias-Sardinha *et al.*, 2002). Lämsiluoto and Järvenpää (2008) investigated how environmental activities were embedded within the BSC in a Finnish food manufacturing system. Their study found that measures for environmental elements were embedded within the internal process perspective. In the Italian food and tourist industries, Van der Woerd and van Den Brink (2004) suggested that five perspectives are necessary (customers and suppliers, financiers and owners, society and planet, internal process and employees and learning). In Portugal organisations, there is evidence that the BSC contains sustainability, stakeholders, internal process and learning and growth perspectives (Dias-Sardinha *et al.*, 2002; Dias-Sardinha and Reijnders, 2005). Meanwhile, Journeault (2016) proposed four perspectives for Canadian non-profit organisations: sustainable perspective (social performance), external stakeholder perspective (financial and environmental performance), internal business processes, skills and capabilities perspectives. The current study uses insights from these studies to explore the perceptions of key internal stakeholders in a large Queensland hospital to understand how environmental performance can be reflected in the organisation's BSC. The remainder of this paper is organised as follows. Section 2 provides the literature review. Section 3 discusses the relevance of stakeholder theory as a conceptual framework to interpret the findings of the study. Section 4 explains the research method, whereas Section 5 outlines the empirical findings and discussion. The conclusions are presented in Section 6.

## 2. Literature review

### 2.1 Environmental performance indicators

Environmental performance refers to managing an organisation's environmental aspects (e.g. fuel consumption, water consumption and environmental impacts [e.g. air pollution, natural resource depletion and water pollution; Feldman, 2012]). The definition of environmental performance has been expanded to "cover a wide range of areas such as waste management, emissions to air, land and water, and the existence of environmental management systems" (Sutantoputra *et al.*, 2012, p. 52). Environmental performance management systems are a group of different organisational management practices that establish, measure and monitor organisation's environmental impacts (Martín-de Castro *et al.*, 2016). These systems include the organisational processes which minimise unwanted environmental outcomes on the natural environment (Dangelico, 2015). Disclosing environmental information voluntarily provides stakeholders with a level of assurance that the organisation is responsive to environmental concerns (Martín-de Castro *et al.*, 2016). The disclosure of environmental information may include data about the organisation's environmental profile, environmental initiatives or environmental performance indicators (Sutantoputra *et al.*, 2012). The focus of this study is the link between environmental performance indicators and the BSC. However, it is important to note that the measurement and disclosure of environmental information are rapidly evolving and organisations make choices about how to report these factors. Performance associated with environmental indicators can be reported in a separate report, an annual report, the organisation's website (Sutantoputra *et al.*, 2012) or in the BSC (Hansen and Schaltegger, 2016). There are also reporting initiatives, such as the Global Reporting Initiative, which are designed to help organisations manage and report on activities that affect environmental sustainability (Vigneau *et al.*, 2015).

Environmental performance, from an accounting perspective, can be reflected in a group of financial and non-financial indicators. These indicators capture the benefits and costs of consuming natural resources such as energy, land or water (Hubbard, 2009). This performance can be measured through monetary environmental information (e.g. dollars) and/or physical environmental information (e.g. kilowatt-hours; kWh). The physical information incorporates the volume of energy, water and materials consumed, whereas monetary data specifies environment-related costs and benefits (Lee, 2011). It is likely that some stakeholders prefer monetary environmental information, whereas others prefer physical environmental information (Bennett *et al.*, 2011).

Monetary environmental costs encompass an organisation's payments in relation to environmental damage and protection (Hansen *et al.*, 2009), whereas environmental revenue is that gained either from sales of recyclable materials (Qian *et al.*, 2011) or grants, subsidies and awards (Gale, 2006). Explicit recognition of the potential cost savings generated through environmentally sensitive activities enables organisations to increase their profitability through efficiency savings (Shapiro *et al.*, 2000). In addition to these efficiency benefits, an organisation's good environmental performance can be a source of increased revenue via enhanced community recognition. Langfield-Smith (2015) considered these reputational benefits to be another motivation for adopting environmental management accounting.

As organisations serve different stakeholder groups, their operational activities affect the community in multiple ways (Hoque, 2006). A hospital has a responsibility to satisfy the financial and non-financial expectations of various stakeholders including shareholders, employees, customers/patients, suppliers, governments and communities (Clarkson, 1995; Donaldson and Preston, 1995). In order for healthcare organisations to meet these expectations, there is growing recognition of the need to report the environmental effects of their operational activities to their stakeholders. Consequently many types of organisations in Europe are now "required to report their carbon emissions to both governments and customers" (Journeault, 2016, p. 217). Generally, the ability to create good relationships with all its stakeholders is considered an essential element of long term organisational survival (Clarkson, 1995; Perrini and Tencati, 2006).

### 2.2 *The role of the balanced scorecard in the healthcare sector*

Since the beginning of 1990s, many accounting techniques such as BSC, economic value added, fair values creation and target costing have been introduced into the management accounting field (Cooper *et al.*, 2017). However, BSC is one of the most popular performance measurement approaches (Cooper *et al.*, 2017). Indeed some commentators suggest that the BSC is a major innovation in the recent history of management accounting (Busco and Quattrone, 2015). Kaplan and Norton (1992) developed the BSC model to address the over reliance on financial measures in traditional management accounting systems. The BSC is a multi-dimensional accounting instrument for evaluating performance and analysing alternative measures with an essential concentration on achieving an organisation's strategic goals (Alewine and Stone, 2013). The BSC may enhance performance measurement judgments by providing decision makers with a comprehensive set of financial and non-financial indicators (Humphreys and Trotman, 2011). It is argued that this provides a more complete picture on the organisation's activities (Hall, 2011).

Proponents of the BSC suggest that, in addition to the financial measures, other non-financial measures (customer, internal business process and learning and growth) have a significant role in organisational performance (Kaplan and Norton, 1992, 1996a; Aidemark, 2001). Thus the BSC is not solely a collection of critical indicators (Möller and Schaltegger, 2005), rather it highlights a balance between a set of inputs and outputs, current

performance driver indicators (lag indicators) and future performance driver indicators (lead indicators), and includes objective and subjective measures that are useful for internal and external stakeholders (Hansen *et al.*, 2009; Atkinson *et al.*, 2012). The BSC also assists to effectively “operationalize managerial discourse concerning goals, missions, values and strategies” (Cooper and Ezzamel, 2013, p. 290). Furthermore, use of the BSC enables managers to share their strategy with all organisational members (Cheng and Humphreys, 2012).

During the past two decades, the use of the BSC in the public sector has received attention in the accounting literature (Hoque, 2014; Bobe *et al.*, 2017; Aidemark, 2001). Throughout this period, there has been increasing pressure on public healthcare organisations to improve performance (Adams *et al.*, 2014). Consequently researchers have recently noted an increase in the application of BSC to the health sector (Trota *et al.*, 2013). Smith and Loonam (2016, p. 407) noted that healthcare organisations are increasingly using the BSC to “attain greater strategic performance measurement”. Another reason suggested for this resurgence is that the BSC takes into account patients, healthcare processes and professional staff development, as well as financial outcomes (Aidemark, 2001). Furthermore, the BSC can accommodate the complexity of healthcare companies by providing a multidimensional system to measure and manage organisational effectiveness (Trota *et al.*, 2013).

Although specific support for the utilisation of the BSC in healthcare organisations occurred as early as 1994 (Griffith, 1994), the use of this model did not become widely evident until the end of the 1990s and the beginning of the new century (Bisbe and Barrubés, 2012). However, the public sector has complex social and political contexts and performance measurement that adequately captures these multiple dimensions is difficult (Hoque, 2014). Financial outcomes do not always provide adequate insights into whether a government organisation is achieving its mission (Kaplan and Norton, 2001). Consequently, the organisation’s mission must be considered at the highest level of its scorecard (Kaplan, 2001).

In the public healthcare sector, the relationship between the financial perspective and customer perspective is interchangeable and reciprocal. For example, the general public, as tax payers, pay taxes to government departments that then allocate funds to receiving agencies (hospitals), which is the financial perspective. Subsequently, the tax payers receive benefits as customers when treated in hospitals. In this context, tax collection is seen as necessary to provide benefits to the community (Soysa *et al.*, 2016). It is not an objective of governments to generate profit but rather to maximise the efficient use of public funds (Kaplan and Norton, 2001). Within the public healthcare industry the internal business process perspective of the BSC identifies the critical internal processes, which are important for the achievement of the intended outcomes of the other perspectives (Figge *et al.*, 2002). This perspective frequently reports indicators that reflect the efficiency and effectiveness of the agency (Butler *et al.*, 2011). The learning and growth perspective of the BSC contains indicators about the capabilities and competences among employees (Aidemark, 2001). Healthcare organisation must continually assess their future needs and ensure that its intellectual capital and human resources, components of the learning and growth perspective, are sufficient to sustain its future survival (Epstein and Wisner, 2001).

It is clear that BSC perspectives should reflect the characteristics of health organisations (Aidemark and Funck, 2009). Therefore, several studies have been conducted to identify BSC perspectives in health organisations. For example, in Sweden, Kollberg and Elg (2011) determined five BSC perspectives: patient/customer, process, development/future, employee and production/economic. A study conducted in a public Australian healthcare organisation

by van de Wetering *et al.* (2006) found four perspectives: clinical business process, patient, quality and transparency and information systems. These researchers observed that just two of the perspectives, clinical business process and patient, are similar to the original BSC perspectives (van de Wetering *et al.*, 2006). In Hong Kong, public health organisations still use perspectives similar to the original BSC perspectives (Yuen and Ng, 2012). Meanwhile, a recent African study revealed that community, financial, internal business process and capacity building are perspectives in the BSC of African health providers (Bobe *et al.*, 2017). Therefore, it is evident that there are multiple ways of refining the BSC to accommodate the healthcare context. In regard to environmental performance, it is likely that healthcare organisations will seek to innovate and creatively adapt the BSC to incorporate appropriate indicators which support their organisational attributes and strategy.

### *2.3 Incorporating the environmental dimension into the balanced scorecard*

There is little consensus as to the best method of incorporating the environmental dimension within the BSC. Johnson (1998) argued that the environmental perspective is already incorporated within the existing four BSC perspectives. Kaplan and Norton (2001) implicitly supported Johnson's assertion when they included social and environmental responsibility as part of internal business process perspective. They argued that organisational value is created through internal business process. Furthermore, Butler *et al.* (2011) supported Johnson's suggestion that major changes to the BSC structure are not required. Figge *et al.* (2002) also supported the argument that environmental issues are automatically embedded within the BSC's cause and effect links. However, their argument contrasted the cause and effect links and advocated for the creation of a separate SBSC, which requires the environmental and social issues to be represented in a standalone perspective of BSC. This is an attractive option for organisations that want to incorporate environmental issues without revamping the original BSC (Butler *et al.*, 2011). However, some commentators argue that this approach does not adequately capture the links to creating financial value (Journeault, 2016). Moreover, Figge *et al.* (2002) stated that the SBSC is an extension of the previous approaches and cannot be considered an independent method. As a result, this approach may provide little benefit to organisations wishing to implement a sustainability strategy (Journeault, 2016).

The model in which a fifth perspective is embedded within the BSC is considered the simplest approach (Butler *et al.*, 2011) to incorporating the environmental dimension. A key benefit of this approach is that this may draw decision makers' attention to environmental responsibility as a core organisation value (Epstein and Wisner, 2001). This helps organisations to connect their environmental initiatives with financial value creation (Journeault, 2016). Although this approach has been accepted by some commentators (Hubbard, 2009; Butler *et al.*, 2011), Kaplan and Wisner (2009) found that providing a separate environmental perspective is not effective unless decision makers receive additional information about the strategic importance of the environmental measures. In addition, the poor connection between the existing BSC perspectives and the additional perspective brings a high risk of failure (Hansen and Schaltegger, 2016). Overall, adding a fifth perspective remains somewhat controversial (Hansen and Schaltegger, 2016) and this makes "its role and contributions ambiguous" (Journeault, 2016, p. 216). It may be easy for managers to ignore the extra perspective and continue to focus on the four traditional perspectives, therefore providing little contribution to achieving the organisation's environmental goals (Hansen and Schaltegger, 2016).

In summary, the extant literature outlines two main arguments for integrating the environmental measures into the BSC. The first argument was developed by Figge *et al.*

(2002) and involves three models: integration of the environmental measures in the four BSC perspectives, additional fifth non-market perspective and development of a separate environmental and social scorecard. The first model argues that integration of the environmental issues in the BSC perspectives is appropriate for environmentally orientated organisations and provides opportunities to increase financial outcomes (i.e. the organisation's success within market) (Figge *et al.*, 2002). The second recommended model is adding a fifth non-market perspective which recognises additional aspects such as customer, socio-cultural, legal sphere, etc. (i.e. the organisation's success from outside market) (Figge *et al.*, 2002). The final model promotes differentiating the environmental and social issues and developing a separate environmental and social scorecard (Figge *et al.*, 2002). However, it is important to observe that this model is an extension to the original two approaches (Figge *et al.*, 2002).

Butler *et al.* (2011) rearranged the above argument. Their approach commences with adding the fifth perspective, then developing a separate SBSC, and finally integration of the environmental issues throughout four BSC perspectives. The fifth perspective model is considered most appropriate for organisations with high-profile exposure to sustainability issues (Butler *et al.*, 2011). However, in some cases, organisations do not have a BSC or they have BSC but they do wish to change the existing BSC (Butler *et al.*, 2011). In this case, Butler *et al.* (2011) recommended the development of a separate SBSC as the second option. Such an approach includes sustainability measures (financial, social and environmental) in a separate BSC. Finally, "the integrated approach works well for companies that have a BSC in place and are willing to evolve that scorecard to reflect sustainability practices" (Butler *et al.*, 2011, p. 5).

A number of differences are evident between the works of Butler *et al.* (2011) and Figge *et al.* (2002). For example, Butler *et al.* (2011), in their first model, considered that the organisation's success (financial or comprehensive success) is the main driver to integrate the environmental and social issues in the BSC. Meanwhile, Figge *et al.* (2002) stressed that developing a separate environmental and social scorecard is not an independent approach because developing a separate environmental and social scorecard cannot be achieved without first achieving integration as well as a fifth perspective. In contrast, Butler *et al.* (2011) stated that the sustainability strategy, availability of BSC and the desire to change are the main drivers to adopt a specific approach. Therefore, their argument commences with adding fifth perspective. Furthermore, they also suggested that a separate SBSC is an independent approach.

It is evident that the potential integration of an environmental dimension into the original BSC is an important and complex question in the management accounting discipline (Thomson *et al.*, 2014). Researchers have considered various ways of incorporating the environmental dimension into the BSC (Johnson, 1998; Kaplan and Norton, 2001; Figge *et al.*, 2002; Hansen and Schaltegger, 2016, 2017; Journeault, 2016; Bieker and Waxenberger, 2002; Bieker, 2003; Butler *et al.*, 2011; Kaplan and Norton, 2004; Kaplan and Wisner, 2009; Möller and Schaltegger, 2005; Hubbard, 2009; Dias-Sardinha *et al.*, 2007, 2002; Hansen *et al.*, 2010). Recently, Hansen and Schaltegger (2016) conducted a review of 69 studies that proposed models and examined ways of incorporating the environmental and social issues within the BSC. They classified the models into several typologies:

Adding a sustainability perspective only (additional perspective); partial integration into existing perspectives; full integration into existing perspectives and integration across existing perspectives while simultaneously adding a dedicated perspective (extended model) (Hansen and Schaltegger, 2016, p. 209).

However, there remains little empirical evidence that explores the experience of healthcare providers in regard to integrating environmental indicators within the BSC. Given the growing recognition of the environmental impacts of healthcare activities and the resultant need to satisfy stakeholder information requirements, it is necessary to fully understand the application of the BSC in this context. This gap in the literature gives rise to this study's research question:

*RQ1.* How can the balanced scorecard be adapted to incorporate environmental performance in a healthcare context?

### 3. Stakeholder theory

In qualitative research, a theory “can connect pieces of research data to generate findings which fit into a larger framework of other studies” (Stewart and Klein, 2016, p. 616). It also can help to code the data for thematic analysis (Stewart and Klein, 2016). Stakeholder theory was used to interpret and inform this research. The use of stakeholder theory is well established in social and environmental accounting research (Chiu and Wang, 2015). This theory acknowledges that business responsibilities include both shareholders' and non-shareholding stakeholders' interests (Almiacik *et al.*, 2011). Accordingly, stakeholder theory recognises that organisational actions are influenced by multiple stakeholders and that organisations attempt to manage competing stakeholder demands (Garvare and Johansson, 2010).

From a stakeholder theory perspective, modern performance measurement systems such as the BSC can be considered as a mechanism to more fully recognise the interests of an organisation's stakeholders (e.g. employees, communities, suppliers, customers and governments). Kaplan and Norton (1996a, 1996b) attempted to include the majority of stakeholders in their BSC model. Expectations of shareholders and customers are explicitly integrated in the financial perspective and customer perspective. Stakeholders such as suppliers and employees are implicitly addressed through internal business processes perspective and learning and growth perspective. This emphasis on stakeholder interests reinforces the relevance of the BSC in a healthcare context because public sector reforms influenced by new public management have promoted the need for such organisations to be accountable for creating public value. In this environment, the success of public sector organisations is dependent on “satisfying stakeholders according to their definition of what is valuable” (Bryson, 2004, p. 25). In this context, the BSC is a flexible model, which can be used to build comprehensive and multi-dimensional performance measures that accommodate multiple stakeholder expectations.

The healthcare sector has a complex and reciprocal relationship with stakeholders. Stakeholders in this context include internal stakeholders, as well as multiple external stakeholders such as government bodies, research organisations, community organisations and the general public. Inadequate attention to environmental performance may degrade the relationship between organisations and their stakeholders' interests (Buysse and Verbeke, 2003; Sutantoputra *et al.*, 2012). However, prior research has recognised that the BSC is an important tool which assists public healthcare managers to fulfil their organisational mission and demonstrate organisational effectiveness to multiple stakeholders (Zelman *et al.*, 2003; Behrouzi *et al.*, 2014; Gonzalez-Sanchez *et al.*, 2017). Collectively, such studies underlie the importance of stakeholder theory in exploring performance measurement systems in public sector organisations.



#### 4. Research method

ABC is a large public healthcare provider in Queensland, Australia[1]. It provides services across an area of approximately 90,000 square kilometres (34,750 square miles) and delivers clinical services to approximately 280,000 people. This represents 5.2 per cent of the Queensland landmass and 5.7 per cent of the Queensland population. It has 29 facilities (such as hospitals, outpatient clinics, aged care facilities, etc.) and 5,000 staff. The researchers have chosen this case study for two key reasons. First, this hospital uses the BSC for performance measurement purposes. In addition, this organisation is currently investigating ways to update their BSC to incorporate sustainability into its performance measurement system.

This research adopts a qualitative approach that uses an in-depth case study consisting of semi-structured interviews and document analysis. Case study research is an appropriate research method for understanding the dynamics of performance measurement within a hospital (Vesty, 2004). The research interview is considered one of the most important qualitative data collection methods (Qu and Dumay, 2011). Qualitative researchers aim to understand subjective human experience (Gilgun, 2005) and the selection of interview participants is a critical decision in qualitative research (Kuper *et al.*, 2008). This is because the knowledge of the participant is a key source of understanding the phenomenon under study (Kuper *et al.*, 2008). An ideal participant is an individual who can provide rich information pertinent to the research question (Sargeant, 2012). Hence, a qualitative researcher must choose participants who have knowledge relevant to the research aim (Devers and Frankel, 2000). Morse (2000) suggested that quality participants should have experience in the topic and available time to share with the researcher, and be willing to relate their experiences to the researcher.

There is little consensus about when to cease interviewing in qualitative studies although Creswell (2018) suggested that saturation point is reached when subsequent interviews generate no new ideas or concepts. However, Hennink *et al.* (2017) argued that saturation should be seen as a multi-dimensional concept which incorporates both code saturation and meaning saturation. Their discussion explicitly recognises that it is common for code saturation to occur relatively early in the interview process whereas meaning saturation often requires additional data. In this study, interviews continued until the authors were confident that the data collected captured the key relevant themes pertinent to the research aim (code saturation). After analysing the transcripts from these interviews the researchers conducted three further interviews to add depth and richness to the data set. These interviews provided the researchers with the opportunity to assess the relevance of prevalent codes by collecting new perspectives which clarify or enrich the emerging issue (Hennink *et al.*, 2017). As per the stopping criterion principle advocated by Francis *et al.* (2010), each consecutive interview was interrogated to assess its contribution to the existing data (Fusch and Ness, 2015). After conducting 16 interviews, the researchers were confident that the richness of the data can explicitly address the research aims.

Thematic analysis was used to identify key themes and recognise connections between them. Thematic analysis demonstrates which themes are significant in the description of the phenomenon under study (Joffe, 2012). It is a useful and flexible approach to deal with a complex phenomenon such as health care (Braun and Clarke, 2006). Documents such as annual reports, strategic plans and websites were also analysed. This phase provided a comprehensive understanding of the organisation and its activities and was critical to establish the manner in which the case study organisation was using the BSC. This also allowed the researchers to ascertain the extent to which the environmental dimension was incorporated into the existing BSC. The document analysis revealed that managers were

using the BSC to monitor and evaluate their organisation performance. Furthermore, there was little evidence that the existing BSC included any environmental information and measures. This motivated the researchers to explore managers' perceptions about possible initiatives to incorporate the environmental information into the BSC.

A total of 16 interviews were conducted with individuals across various organisational designations (A, B and C). Group A consists of managers, financial controllers and accounting staff. Group B includes operational staff involved in maintenance, engineering infrastructure and facility services. Group C refers to nursing and medicine staff. The interviews were conducted throughout 2018 and typically lasted between 30 and 60 min. Table I provides details of the participants. Interviewees were carefully selected to ensure that a cross section of the organisation was captured to reduce the potential for bias in responses (Sargeant, 2012). This approach is designed to increase the validity of the research findings, as it allows the researcher to be confident in the "accuracy of the findings" (Creswell, 2018, p. 199). This type of triangulation can be seen as a validity check (Golafshani, 2003; Mathison, 1988).

Prior to the interviews, an executive summary, information sheet and consent form were sent to the participants. A sample of interview questions is provided in the Appendix. All interviews were conducted at the participants' office. Interviews were audio recorded for transcription purposes and to improve the reliability of the research findings. Reliability of qualitative research is "established through accurate data recording and transcription" (Lewis, 2015, p. 474).

In this study, the authors used a thematic approach to analysing the data. Data analysis was informed by the following steps (Braun *et al.*, 2019):

- **Familiarisation:** After each interview, the first author reviewed the audio recording to concentrate on absorbing the participants' responses. At this stage, preliminary notes of each interview were taken. The interviews were then sent to a transcription service. The transcriber was asked to transcribe the interviews verbatim. Once the completed transcripts were received, the same author read the transcripts several times and compared these to the preliminary notes. These steps were conducted to ensure that the author had a thorough understanding of the evidence that had been collected;
- **Generating codes:** This stage involved the researcher organising the data into meaningful blocks of information. This allows the researcher to begin to generate meaning from the data. In this study, an inductive orientation was adopted which allowed the data to reveal the codes.
- **Constructing themes:** This phase developed useful themes from the codes. To do this, all codes were explored to identify the key characteristics of the data. The

Group A		Group B		Group C	
Management, finance and accounting staff (MFAS)		Operational staff (OS)		Nursing and medicine staff (NS)	
Participant code	Position	Participant code	Position	Participant code	Position
MFAS1	Senior level	OS1	Senior level	NMS1	Senior level
MFAS2	Senior level	OS2	Middle level	NMS2	Middle level
MFAS3	Middle level	OS3	Middle level	NMS3	Middle level
MFAS4	Middle level	OS4	Middle level	NMS4	Middle level
MFAS5	Junior level	OS5	Middle level	NMS5	Middle level
MFAS6	Senior level				

**Table I.**  
Interviewee details

researchers looked for patterns in the codes which led to the development of “coherent clusters of meaning” (Braun *et al.*, 2019, p. 855). The use of thematic mapping informed this stage and helped visually represent the important conceptual meanings.

- Revising and defining themes: Using the initial list of themes, the researchers then revisited these themes and reflected on them within the context of the research question (Jason and Glenwick, 2016). This process resulted in some themes being disregarded and others being combined because they portrayed similar concepts (Braun *et al.*, 2019).

The researchers used NVivo as a coding tool. NVivo provides an efficient way of organising and collating data. The data were initially sorted into three main groups (A, B and C), according to the background of the interviewee. Researchers then coded each interview to develop themes and sub-themes. The authors then independently rechecked the codes (Gibbs, 2008) and analysed the data in detail. Various searches were undertaken on the data to identify relevant connections and compare participant responses. The query tool was also used to help identify pertinent information.

## 5. Findings and discussion

Participants in this study reported that a number of different approaches could be used to incorporate the environmental performance indicators within the BSC in their organisation. These approaches tended to reflect the models proposed by the existing literature. However, there was little agreement as to which method is most appropriate for the organisational context. There was also evidence that a number of contingent organisational factors influence internal stakeholder perceptions about how to fully report the environmental impacts of organisational activities. For some participants, it was important that endogenous and exogenous environmental events are differentiated. This resulted in the suggestion of an additional model in which internal environmental aspects are accommodated within the financial perspective of the BSC and a separate perspective for the effects of climate change is implicated. The remainder of this section reviews the interview findings in details and outlines the proposed methods for refining the BSC.

### 5.1 Model 1: Full integration

Participants in this study reinforced the understanding that organisational strategy is the first step of identifying how to incorporate environmental performance within the BSC. This reflects the literature which emphasises that it is critical to create an understanding of the organisation’s mission and strategy (Lipe and Salterio, 2000). Therefore, choosing the most suitable model for incorporating environmental performance into the BSC is contingent on the vision and strategy of the organisation. As two participants elaborated:

It really depends on how we want position ourselves as a business – [...] so coming back to the vision and strategy (MFAS3).

I think that the balanced score card follows our strategic [direction] and that’s why we try to connect it to the strategy. If we were to improve our environmental strategy and include it in our strategic plan, our balanced scorecard should feature some of our strategies to do with the environment. Whether its own thing or incorporated within one of these (MFAS2).

This approach is consistent with creators of the BSC, Kaplan and Norton (1996a, 1996b), who asserted that managers need to review their mission statement first and

then they can develop their vision and strategy (Kaplan and Norton, 2001). According to Möller and Schaltegger (2005) and Johnson (1998), reporting environmental performance under the BSC does not simply involve adding environmental measures. This finding is also consistent with Möller and Schaltegger's conclusion (2005) that suggests effectively embedding environmental performance within the BSC requires a reconsidered vision, new design and new data. In other words, "structure follows strategy" (Chandler, 1990, p. 14). This is supported by participants who argued that it is necessary to explicitly acknowledge the organisational strategy for environmental considerations before connecting it to the BSC.

Strategy can also translate to specifying management's desired associations between BSC perspectives (Hansen *et al.*, 2009). This requires connecting the environmental indicators with other financial and nonfinancial measures (Johnson, 1998). Some participants such as MFAS3, OS2, MFAS5 and NMS5 advocated integrating environmental indicators throughout existing BSC perspectives. For NMS5, the direct relationship between the environmental indicators and other BSC indicators is an important reason to follow a full integration approach[2]:

Certainly environmental factors and environmental repercussions have direct or indirect influences into all four. [...] It is probably a component of all four customer, financial, internal and learning and growth (NMS5).

Other participants acknowledged that environmental performance is not evident in the strategic priority areas for their organisation. Accordingly, they also favoured the full integration approach:

At this point in time our core vision statement is, "caring for the community's healthcare together," of which I feel the environmental perspective falls under the existing perspectives. Having the resourcing to train every single employee in being environmentally aware is not one of our core priorities. [...] We're embedding it in our existing strategies rather than making it a standalone (MFAS3).

It probably sits across a number of those [four existing perspectives]. [...] It shouldn't be a thing on its own. It should be integrated with a number of activities that we're doing (OS2).

We probably would not focus on the environmental aspect as a single thing. It would probably feed into one of our other dimensions. I don't think we'd create a new one. It's probably more around processes. [...] It wouldn't necessarily be a separate dimension (MFAS5).

The above insights resemble Butler *et al.*'s approach (2011) that states this tactic is suitable for organisations which do not wish to undertake major revisions to their BSC. Furthermore, this approach implies that integration within the existing BSC perspectives can adequately capture stakeholder expectations regarding environmental performance.

### 5.2 Model 1: Partial integration

Commentators have acknowledged that full integration is not always suitable for all organisations (Journeault, 2016). This was also reflected in this study, as some participants reject full integration and advocate adopting the partial integration model[3]. In this study, this generally involved two positions. The first position argues that the environmental measures should be reported under one of the existing perspectives. However, the second position states that integration of the environmental issues within two of the existing perspectives is more practical.

Some participants such as NMS5 and MFAS4 concentrated on the starting point of the environmental activities. From their perspective, they argued that environmental

performance is essentially created by internal processes. For this reason, they suggested that environmental measures should be included under the internal business process perspective. As the participants explained:

If you were to put them into one basket where it has the most influence, I would say it's probably within internal perspective (NMS5).

[The environmental dimension] would map back to probably the right processes. [...] So, the right processes-, under our planning objective we have a strategy to identify and respond to environmental risks and ensure sustainability (MFAS4).

A key argument underlying this approach is that complying with national regulations on the environment is an essential part of value-creating processes (Kaplan and Norton, 2004). Accordingly, organisations need to re-design internal processes to reflect environmental standards (Marchi *et al.*, 2013; Campbell *et al.*, 2018) and create value for its stakeholders (Kaplan and Norton, 2004). This link between external environmental standards and internal business process is also supported by other researchers (Lang-Koetz *et al.*, 2008; Buytendijk and O'Rourke, 2008). Sands *et al.* (2016) found that direct relationships existed between environmental performance and value creating activities within the internal business process perspective. The authors concluded that their results provide support for the feasibility of integrating environmental, social and innovation-orientated value-creating process into the internal process of the four-perspective BSC model (Sands *et al.*, 2016).

An alternative approach was also recognised by Kaplan and Norton (2004) who noted the relevance of the learning and growth perspective which focuses on three areas: human capital, information technology capital and organisational capital. Comments from some participants in this study reflected this potential approach:

We could do it within the staff [perspective]. Otherwise when we get to other processes I think it's very difficult. I think it has to be done at a higher level (NMS4).

This model is consistent with Henriques and Sadorsky's (1999) observation, which states that improving environmental outcomes relies on employees' participation (Henriques and Sadorsky, 1999). For example, highly trained and experienced engineers are "the key to ensuring that the process is efficient and that improvements are continually identified" (Wynder, 2010, p. 236). This will ensure that the BSC can generate successful outcomes (Sinha, 2006). However, in relation to BSC design, this point of view has received limited attention in the literature.

Overall, there was notable support for the suggestion that environmental performance would be best captured in the financial dimension. However, these participants also noted that there was considerable potential for individual bias to influence the structural design of the BSC:

It depends on who you're talking. So everyone has their own bias [...] So if you're talking to an accountant, they'd say go straight into the financial section of the plan. If you're talking to an environmental scientist they'll say it'll be part of the overall healthcare strategy, or something like that so it just depends on what. [...] So, for someone like me I'm very financial focussed and numbered. [...] For me I would put in the financial section of it (OS4).

I often think of the balance scorecard with what we've currently got, it's purely driven by the finance team in collaboration with us as the service manager group, but it's largely built around finances and what track we're on to achieving those outcomes that we need to achieve with the finances that we've got (NMS3).

A further two participants also proposed the financial perspective as the optimal dimension for integrating environmental performance. However, their argument varied from their colleagues and emphasised the potential to gain financial benefits from environmental activities.

[For example,] clinical waste is often looked at in terms of from a finance perspective. What is it costing us? [. . .][Therefore,] the obvious one that crops out is sustainable resources (NMS3).

Although many participants supported the inclusion of environmental performance in one BSC perspective, there was some support for integration in multiple perspectives. These participants recommended leveraging the natural link among internal business processes perspective and learning and growth perspective to report the environmental position:

Definitely the right processes because a lot of the environmental stuff we come around process management [. . .] and resources. Resource management around– you’ve got to have experts in the field to understand what you’re trying– for instance, if you put this into a balance score card you’ve got to have someone who understands what– so, the resources to understand what you’re putting in there, to interpret– they can educate people on what we’re actually looking at. And then those experts too can formulate processes in order to manage the [environmental issues] (NMS1).

The environmental factor is somewhere between internal process and innovation. [. . .] The growth and learning, you should be looking at the next emergent technology and new methodology that you’re going to become more environmentally friendly. [. . .] We are sending these people here to learn about this. [. . .] Better thinking people that will be having the learning and growth driving the new innovations in internal process. [. . .] Growth and innovation will drive the internal process (OS5).

This approach has some recognition in the existing literature and [Sands \*et al.\* \(2016\)](#) investigated the direct relationship between the learning and growth perspective and internal processes perspective. In particular, environmental performance was linked with several human capital components of the learning and growth (autonomy, effective goal commitment, training to safety and health performance and employment practices [within the regulatory and social processes] were identified (Sands *et al.*, 2016). From an internal stakeholder position, these findings appear to link environmental performance with specific organisational activities or processes. This point of view may reflect the understanding that “the influence of each stakeholder on the firm is dissimilar, and the expectations of different stakeholders are diverse and sometimes conflicting” ([Helfaya and Moussa, 2017](#), p. 1063).

### 5.3 Model 2: Additional fifth perspective

There was evidence that some participants believe a new environmental perspective was warranted in this organisation. The literature suggests that a BSC design needs to have a mature environmental strategy to effectively link the environmental measures with other financial and nonfinancial measures ([Johnson, 1998](#)). Hence, these participants suggested that the lack of institutional emphasis on environmental performance means that it is inappropriate to utilise the full or partial integration approach:

Environmental is never going to be a priority unless you make it on the balanced scorecard, make it the 5th one. So [. . .] it should be an additional 5th line if you want it to be important. Because while it’s one of the 4 it will never be a priority (MFAS6).

If we want to position as an environmentally sustainable corporate citizen and that’s our main positioning statement then that would be further argument to have it as its own standalone sphere (MFAS3).

It would raise more awareness if it was a separate one. That's probably why I thought it would be good by itself because at the moment if you put it under one of these things it may be lost (MFAS2).

This supports the literature that suggests that organisations in the early stage of dealing with the environmental issues (such as this case study) may be best to consider this approach as a means of raising the profile of environmental activities:

It would stand out more because we don't do anything now. We are quite obviously omitting anything to do with factors to do with the environment and any of our reporting. We don't do any reporting on the environment now in a balance score card type of thing (MFAS2).

These viewpoints indicate an addition of a fifth perspective can be used to signal that the organisation carefully considers the environmental consequences of its activities. This may be seen as a way to promote the organisation's ability to receive support from its stakeholders (Dobbs and Van Staden, 2016).

#### *5.4 Model 3: New perspective for climate change coupled with other environmental aspects integrated into the financial perspective*

The third approach identified in this study deviates from the extant literature and represents a significant development in the design of environmental performance measurement. This approach is based on explicitly differentiating between endogenous and exogenous environmental elements. With regard to endogenous environmental elements, the organisation is responsible for activities such as energy consumption, water consumption, waste production, etc. Managing these environmental concerns is necessary to ensure organisational efficiency and improved financial outcomes. According to traditional BSC design, the financial perspective reflects activities that support performance towards the organisation's desired financial results. Accordingly, participants in this study explicitly recognised that financial benefits which derive from the organisation's endogenous environmental activities should be reported under the financial perspective:

For electricity, water, waste, looking into those issues the main thing is looking at our own efficiency. We get a nice benefit that we're being a good corporate citizen but the real reason we're looking at that is because we want to save money. When we use less water, when we want to use less electricity, we want to make less waste and in the end we get a financial benefit from that. I think those parts fit in the financial part (OS1).

However, it was also argued that the organisational activities affected by exogenous environmental events such as climate change and microbiological phenomenon may be best reported separately. This approach explicitly acknowledges that these events affect the organisation's ability to operate effectively and therefore a fifth perspective should separately recognise the institutional consequences of exogenous environmental elements:

Climate change, to me, it's a little bit different. I'm a bit more interested in business continuity because let's say for example in this part of the world climate change results in higher frequency of flood events and in the ABC area flood all the time – more often and we can't move patients between hospitals or we can't get food supplies into hospitals. Those sorts – that effects whether we can continue business. So, there's business continuity effects. [...] I think [...] things like climate change could almost be a fifth dimension (OS1).

This argument provides motivation to further explore the institutional consequences of explicitly recognising the source of environmental events: endogenous and exogenous. Endogenous elements such as energy consumption, water consumption and waste production are controllable and occur on an expected basis. Conversely, other elements such

as climate change and microbiological phenomenon are uncontrollable and occur randomly and unexpectedly. As a result, incorporating these non-homogeneous elements within the same performance measurement system may distort the interpretation of organisational results. This possibility has yet to be fully considered in the literature either within or beyond the hospital sector.

## 6. Conclusions

This study was conducted in the Australian public healthcare sector. The findings suggest that healthcare providers recognise the critical nature of environmental performance in creating value for both internal and external stakeholders. In regard to developing a performance measurement model based on the BSC, we identify four potential BSC approaches: partially integrated model, fully integrated model, an expanded model with five perspectives and an integrated model coupled with a separate climate change perspective. The study provides some support for proponents of the fully integrated approach (Johnson, 1998; Figge *et al.*, 2002). In addition, proponents for the partially integrated approach receive support for their view. In this study, partial integration is implicated in two potential models. First, the organisation links the environmental dimension to one of three perspectives: internal business process, financial or learning and growth. Another option is to integrate the environmental measures in both the learning and growth perspective and internal business process perspective. There is little reference in the literature about this dual perspective approach and this is worthy of further exploration.

The addition of a separate fifth environmental perspective is favoured by some participants. This is consistent with the work of Butler *et al.* (2011). In this study, participants argued that integration approach (partially or fully) undermines the importance of environmental issues. Therefore, an additional fifth perspective provides an effective vehicle to promote the visibility of environmental issues. This study also provides a novel contribution by highlighting the potential need to separate endogenous and exogenous environment elements when designing the BSC. Also of interest is the finding that there was no support for an entirely separate SBSC.

The study has explored ways to integrate environmental performance measures into the BSC. It is evident that environmental performance measurement is heavily contingent on the organisational environmental strategy. Furthermore, there is evidence that internal stakeholders appreciate the role that environmental performance plays in regard to satisfying external stakeholders. It is clear that participants understand the need for healthcare services to demonstrate the creation of value across various dimensions. However, there is also a recognition that not all stakeholders have the same power to influence organisational decisions (Harrison *et al.*, 2010). This may contribute to the varying perceptions in regards to how to integrate environmental performance in the BSC. According to stakeholder theory, the integration of environmental indicators in the BSC can be seen as a tool to demonstrate organisation environmental responsibility to some stakeholders (Hansen and Schaltegger, 2016; Hubbard, 2009). Participants in this study noted that the relative visibility of environmental performance measures may reflect the perceived importance of various stakeholders (Herremans *et al.*, 2016). Such findings may encourage organisations to clearly identify their target stakeholders before developing a bespoke BSC. In addition, the proposed development of a separate organisational scorecard to reflect exogenous factors reflects the participants' understanding that not all institutional practices are controllable. Potentially, this separation may be interpreted as a means of moderating stakeholder expectations.

This study provides impetus for future research that explores the development of the BSC in healthcare organisations. The stakeholder theory provides a relevant interpretive



framework for understanding how these organisations attempt to address internal and external stakeholder expectations. How this translates into the practice of environmental performance measurement requires further investigation. The findings reinforce [Journeault's \(2016\)](#) claim which acknowledges the best approach to incorporating environmental performance in the BSC remains an open question. Future research is required to explore comprehensively the implications associated with explicitly recognising endogenous and exogenous environmental events as separate organisational influences. In addition, it is necessary to identify the barriers to incorporating the environmental dimension into the BSC, particularly in public sector contexts.

### Notes

1. In accordance with ethics approval to conduct the study, the name of the hospital has been changed to ensure its anonymity.
2. Full integration approach refers to integrating environmental indicators throughout existing BSC perspectives.
3. Partial integration approach refers to integrate the environmental indicators within one or more BSC perspective(s) but not all BSC perspectives.

### References

- Adams, C., Muir, S. and Hoque, Z. (2014), "Measurement of sustainability performance in the public sector", *Sustainability Accounting, Management and Policy Journal*, Vol. 5 No. 1, pp. 46-67.
- Aidemark, L.G. (2001), "The meaning of balanced scorecards in the health care organisation", *Financial Accountability and Management*, Vol. 17 No. 1, pp. 23-40.
- Aidemark, L.G. and Funck, E.K. (2009), "Measurement and health care management", *Financial Accountability and Management*, Vol. 25 No. 2, pp. 253-276.
- Alewine, H.C. and Stone, D.N. (2013), "How does environmental accounting information influence attention and investment?", *International Journal of Accounting and Information Management*, Vol. 21 No. 1, pp. 22-52.
- Alniacik, U., Alniacik, E. and Genc, N. (2011), "How corporate social responsibility information influences stakeholders' intentions", *Corporate Social Responsibility and Environmental Management*, Vol. 18 No. 4, pp. 234-245.
- Atkinson, A.A. Kaplan, R.S. Matsumura, E. and Mark Young, S. (2012), "Management accounting: Information for decision making and strategy execution-6/E".
- Behrouzi, F., Shaharoun, A.M. and Ma'aram, A. (2014), "Applications of the balanced scorecard for strategic management and performance measurement in the health sector", *Australian Health Review*, Vol. 38 No. 2, pp. 208-217.
- Bennett, M., Schaltegger, S. and Zvezdov, D. (2011), "Environmental management accounting", *Review of Management Accounting Research*, Springer, pp. 53-84.
- Bieker, T. (2003), "Sustainability management with the balanced scorecard", *>Proceedings of 5th international summer academy on technology studies*, pp. 17-34.
- Bieker, T. and Waxenberger, B. (2002), "Sustainability balanced scorecard and business ethics-developing a balanced scorecard for integrity management".
- Bisbe, J. and Barrubés, J. (2012), "The Balanced scorecard as a management tool for assessing and monitoring strategy implementation in health care organisations", *Revista Española de Cardiología (English Edition)*, Vol. 65 No. 10, pp. 919-927.

- Blass, A.P., da Costa, S.E.G., de Lima, E.P. and Borges, L.A. (2017), "Measuring environmental performance in hospitals: a practical approach", *Journal of Cleaner Production*, Vol. 142, pp. 279-289.
- Bobe, B.J., Bobe, B.J., Mihret, D.G., Mihret, D.G., Obo, D.D. and Obo, D.D. (2017), "Public-sector reforms and balanced scorecard adoption: an Ethiopian case study", *Accounting, Auditing and Accountability Journal*, Vol. 30 No. 6, pp. 1230-1256.
- Braun, V. and Clarke, V. (2006), "Using thematic analysis in psychology", *Qualitative Research in Psychology*, Vol. 3 No. 2, pp. 77-101.
- Braun, V., Clarke, V., Hayfield, N. and Terry, G. (2019), "Thematic analysis", *Handbook of Research Methods in Health Social Sciences*, Springer, pp. 843-860.
- Bryson, J.M. (2004), "What to do when stakeholders matter: stakeholder identification and analysis techniques", *Public Management Review*, Vol. 6 No. 1, pp. 21-53.
- Burritt, R.L., Schaltegger, S., Burritt, R.L. and Schaltegger, S. (2010), "Sustainability accounting and reporting: fact or trend?", *Accounting, Auditing and Accountability Journal*, Vol. 23 No. 7, pp. 829-846.
- Busco, C. and Quattrone, P. (2015), "Exploring how the balanced scorecard engages and unfolds: articulating the visual power of accounting inscriptions", *Contemporary Accounting Research*, Vol. 32 No. 3, pp. 1236-1262.
- Butler, J.B., Henderson, S.C. and Raiborn, C. (2011), "Sustainability and the balanced scorecard", *Management Accounting Quarterly*, Vol. 12 No. 2, pp. 1-10.
- Buysse, K. and Verbeke, A. (2003), "Proactive environmental strategies: a stakeholder management perspective", *Strategic Management Journal*, Vol. 24 No. 5, pp. 453-470.
- Buytendijk, F. and O'Rourke, J. (2008), "Sustainability matters: why and how business is widening its focus to consider the needs of all stakeholders", An Oracle White Paper, available at: [www.taysols.com.au/pdf/oracle\\_sustainability\\_whitepaper.pdf](http://www.taysols.com.au/pdf/oracle_sustainability_whitepaper.pdf) (accessed 5 September 2011).
- Campbell, D., Datar, S.M., Kulp, S.L. and Narayanan, V. (2018), *Horngren's Cost Accounting: A Managerial Emphasis*, Pearson Education.
- Chandler, A.D. (1990), *Strategy and Structure: Chapters in the History of the Industrial Enterprise*, MIT press.
- Cheng, M.M. and Humphreys, K.A. (2012), "The differential improvement effects of the strategy map and scorecard perspectives on managers' strategic judgments", *The Accounting Review*, Vol. 87 No. 3, pp. 899-924.
- Chiu, T.K. and Wang, Y.-H. (2015), "Determinants of social disclosure quality in Taiwan: an application of stakeholder theory", *Journal of Business Ethics*, Vol. 129 No. 2, pp. 379-398.
- Christ, K.L. and Burritt, R.L. (2013), "Environmental management accounting: the significance of contingent variables for adoption", *Journal of Cleaner Production*, Vol. 41, pp. 163-173.
- Chung, J.W. and Meltzer, D.O. (2009), "Estimate of the carbon footprint of the US health care sector", *JAMA*, Vol. 302 No. 18, pp. 1967-1972.
- Clarkson, M.E. (1995), "A stakeholder framework for analyzing and evaluating corporate social performance", *Academy of Management Review*, Vol. 20 No. 1, pp. 92-117.
- Cooper, D.J. and Ezzamel, M. (2013), "Globalization discourses and performance measurement systems in a multinational firm", *Accounting, Organizations and Society*, Vol. 38 No. 4, pp. 288-313.
- Cooper, D.J., Ezzamel, M. and Qu, S.Q. (2017), "Popularizing a management accounting idea: the case of the balanced scorecard", *Contemporary Accounting Research*, Vol. 34 No. 2, pp. 991-1025.
- Creswell, J.W. (2018), *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, 5th ed., SAGE, Los Angeles.
- Dangelico, R.M. (2015), "Improving firm environmental performance and reputation: the role of employee green teams", *Business Strategy and the Environment*, Vol. 24 No. 8, pp. 735-749.

- Devers, K.J. and Frankel, R.M. (2000), "Study design in qualitative research – 2: sampling and data collection strategies", *Education for Health*, Vol. 13 No. 2, p. 263.
- Dias-Sardinha, I. and Reijnders, L. (2005), "Evaluating environmental and social performance of large Portuguese companies: a balanced scorecard approach", *Business Strategy and the Environment*, Vol. 14 No. 2, pp. 73-91.
- Dias-Sardinha, I., Reijnders, L. and Antunes, P. (2002), "From environmental performance evaluation to eco-efficiency and sustainability balanced scorecards", *Environmental Quality Management*, Vol. 12 No. 2, pp. 51-64.
- Dias-Sardinha, I., Reijnders, L. and Antunes, P. (2007), "Developing sustainability balanced scorecards for environmental services: a study of three large Portuguese companies", *Environmental Quality Management*, Vol. 16 No. 4, pp. 13-34.
- Dobbs, S. and Van Staden, C. (2016), "Motivations for corporate social and environmental reporting: New Zealand evidence", *Sustainability Accounting, Management and Policy Journal*, Vol. 7 No. 3, pp. 449-472.
- Donaldson, T. and Preston, L.E. (1995), "The stakeholder theory of the corporation: concepts, evidence, and implications", *Academy of Management Review*, Vol. 20 No. 1, pp. 65-91.
- Epstein, M.J. and Wisner, P.S. (2001), "Using a balanced scorecard to implement sustainability", *Environmental Quality Management*, Vol. 11 No. 2, pp. 1-10.
- Feldman, I.R. (2012), "ISO standards, environmental management systems, and ecosystem services", *Environmental Quality Management*, Vol. 21 No. 3, pp. 69-79.
- Figge, F., Hahn, T., Schaltegger, S. and Wagner, M. (2002), "The sustainability balanced scorecard—linking sustainability management to business strategy", *Business Strategy and the Environment*, Vol. 11 No. 5, pp. 269-284.
- Francis, J.J., Johnston, M., Robertson, C., Glidewell, L., Entwistle, V., Eccles, M.P. and Grimshaw, J.M. (2010), "What is an adequate sample size? Operationalising data saturation for theory-based interview studies", *Psychology and Health*, Vol. 25 No. 10, pp. 1229-1245.
- Fusch, P.I. and Ness, L.R. (2015), "Are we there yet? Data saturation in qualitative research", *The Qualitative Report*, Vol. 20 No. 9, pp. 1408-1416.
- Gale, R. (2006), "Environmental management accounting as a reflexive modernization strategy in cleaner production", *Journal of Cleaner Production*, Vol. 14 No. 14, pp. 1228-1236.
- Garvare, R. and Johansson, P. (2010), "Management for sustainability – a stakeholder theory", *Total Quality Management*, Vol. 21 No. 7, pp. 737-744.
- Gibbs, G.R. (2008), *Analysing Qualitative Data*, Sage.
- Gilgun, J.F. (2005), "Qualitative research and family psychology", *Journal of Family Psychology*, Vol. 19 No. 1, p. 40.
- Golafshani, N. (2003), "Understanding reliability and validity in qualitative research", *The Qualitative Report*, Vol. 8 No. 4, pp. 597-606.
- Gonzalez-Sanchez, M.B., Broccardo, L. and Martins Pires, A.M. (2017), "The use and design of the BSC in the health care sector: a systematic literature review for Italy, Spain, and Portugal", *The International Journal of Health Planning and Management*, Vol. 33 No. 1, pp. 6-30.
- Griffith, J.R. (1994), "Reengineering health care: management systems for Survivors1", *Hospital & Health Services Administration*, Vol. 39 No. 4, pp. 451-470.
- Hall, M. (2011), "Do comprehensive performance measurement systems help or hinder managers' mental model development?", *Management Accounting Research*, Vol. 22 No. 2, pp. 68-83.
- Hansen, D.R., Mowen, M.M. and Guan, L. (2009), *Cost Management: Accounting and Control*, 6th ed., South-Western, Mason, OH.
- Hansen, E.G. and Schaltegger, S. (2016), "The sustainability balanced scorecard: a systematic review of architectures", *Journal of Business Ethics*, Vol. 133 No. 2, pp. 193-221.

- Hansen, E.G. and Schaltegger, S. (2017), "Sustainability balanced scorecards and their architectures: irrelevant or misunderstood?", *Journal of Business Ethics*, Vol. 150 No. 4, pp. 1-16.
- Hansen, E.G., Sextl, M. and Reichwald, R. (2010), "Managing strategic alliances through a community-enabled balanced scorecard: the case of Merck Ltd, Thailand", *Business Strategy and the Environment*, Vol. 19 No. 6, pp. 387-399.
- Harrison, J.S., Bosse, D.A. and Phillips, R.A. (2010), "Managing for stakeholders, stakeholder utility functions, and competitive advantage", *Strategic Management Journal*, Vol. 31 No. 1, pp. 58-74.
- Helfaya, A. and Moussa, T. (2017), "Do board's corporate social responsibility strategy and orientation influence environmental sustainability disclosure? UK evidence", *Business Strategy and the Environment*, Vol. 26 No. 8, pp. 1061-1077.
- Hennink, M.M., Kaiser, B.N. and Marconi, V.C. (2017), "Code saturation versus meaning saturation: how many interviews are enough?", *Qualitative Health Research*, Vol. 27 No. 4, pp. 591-608.
- Henriques, I. and Sadorsky, P. (1999), "The relationship between environmental commitment and managerial perceptions of stakeholder importance", *Academy of Management Journal*, Vol. 42 No. 1, pp. 87-99.
- Herremans, I.M., Nazari, J.A. and Mahmoudian, F. (2016), "Stakeholder relationships, engagement, and sustainability reporting", *Journal of Business Ethics*, Vol. 138 No. 3, pp. 417-435.
- Hoque, Z. (2006), *Methodological Issues in Accounting Research: Theories, Methods and Issues*, Spiramus Press Ltd.
- Hoque, Z. (2014), "20 Years of studies on the balanced scorecard: trends, accomplishments, gaps and opportunities for future research", *The British Accounting Review*, Vol. 46 No. 1, pp. 33-59.
- Hubbard, G. (2009), "Measuring organisational performance: beyond the triple bottom line", *Business Strategy and the Environment*, Vol. 18 No. 3, pp. 177-191.
- Humphreys, K.A. and Trotman, K.T. (2011), "The balanced scorecard: the effect of strategy information on performance evaluation judgments", *Journal of Management Accounting Research*, Vol. 23 No. 1, pp. 81-98.
- Jason, L. and Glenwick, D. (2016), *Handbook of Methodological Approaches to Community-Based Research: Qualitative, Quantitative, and Mixed Methods*, Oxford university press.
- Joffe, H. (2012), "Thematic analysis", *Qualitative Research Methods in Mental Health and Psychotherapy: A Guide for Students and Practitioners*, Vol. 1, pp. 210-223.
- Johnson, S.D. (1998), "Identification and selection of environmental performance indicators: application of the balanced scorecard approach", *Corporate Environmental Strategy*, Vol. 5 No. 4, pp. 34-41.
- Journeault, M. (2016), "The integrated scorecard in support of corporate sustainability strategies", *Journal of Environmental Management*, Vol. 182, pp. 214-229.
- Kaplan, R.S. (2001), "Strategic performance measurement and management in nonprofit organisations", *Nonprofit Management and Leadership*, Vol. 11 No. 3, pp. 353-370.
- Kaplan, R.S. (2008), "Conceptual foundations of the balanced scorecard", *Handbooks of Management Accounting Research*, Harvard Business School, Harvard University, USA, Vol. 3, pp. 1253-1269.
- Kaplan, R.S. and Norton, D.P. (1992), "The balanced scorecard: measures that drive performance", *Harvard Business Review*, Vol. 70 No. 1, pp. 71-79.
- Kaplan, R.S. and Norton, D.P. (1996a), *The Balanced Scorecard: Translating Strategy into Action*, Harvard Business Press.
- Kaplan, R.S. and Norton, D.P. (1996b), "Using the balanced scorecard as a strategic management system", *Harvard Business Review*.
- Kaplan, R.S. and Norton, D.P. (2001), "Transforming the balanced scorecard from performance measurement to strategic management: part I", *Accounting Horizons*, Vol. 15 No. 1, pp. 87-104.
- Kaplan, R.S. and Norton, D.P. (2004), *Strategy Maps: Converting Intangible Assets into Tangible Outcomes*, Harvard Business Press.

- Kaplan, S.E. and Wisner, P.S. (2009), "The judgmental effects of management communications and a fifth balanced scorecard category on performance evaluation", *Behavioral Research in Accounting*, Vol. 21 No. 2, pp. 37-56.
- Kaplan, S., Sadler, B., Little, K., Franz, C., Orris, P. and Fund, C. (2012), *Can Sustainable Hospitals Help Bend the Health Care Cost Curve?*, Commonwealth Fund.
- Kollberg, B. and Elg, M. (2011), "The practice of the balanced scorecard in health care services", *International Journal of Productivity and Performance Management*, Vol. 60 No. 5, pp. 427-445.
- Kuper, A., Lingard, L. and Levinson, W. (2008), "Critically appraising qualitative research", *BMJ*, Vol. 337, pp. a1035-a1035.
- Lang-Koetz, C., Beucker, S. and Heubach, D. (2008), "Estimating environmental impact in the early stages of the product innovation process", *Environmental Management Accounting for Cleaner Production*, Vol. 24, p. 49.
- Langfield-Smith, K. (2015), *Management Accounting: Information for Creating and Managing Value*, 7th ed., McGraw-Hill Education Australia Pty Ltd, North Ryde NSW.
- Lämsiluoto, A. and Järvenpää, M. (2008), "Environmental and performance management forces: integrating 'greenness' into balanced scorecard", *Qualitative Research in Accounting and Management*, Vol. 5 No. 3, pp. 184-206.
- Lämsiluoto, A. and Järvenpää, M. (2010), "Greening the balanced scorecard", *Business Horizons*, Vol. 53 No. 4, pp. 385-395.
- Lee, K.H. (2011), "Motivations, barriers, and incentives for adopting environmental management (cost) accounting and related guidelines: a study of the Republic of Korea", *Corporate Social Responsibility and Environmental Management*, Vol. 18 No. 1, pp. 39-49.
- Lewis, S. (2015), "Qualitative inquiry and research design: choosing among five approaches", *Health Promotion Practice*, Vol. 16 No. 4, pp. 473-475.
- Lipe, M.G. and Salterio, S.E. (2000), "The balanced scorecard: judgmental effects of common and unique performance measures", *The Accounting Review*, Vol. 75 No. 3, pp. 283-298.
- Marchi, V.D., Maria, E.D. and Micelli, S. (2013), "Environmental strategies, upgrading and competitive advantage in global value chains", *Business Strategy and the Environment*, Vol. 22 No. 1, pp. 62-72.
- Martín-de Castro, G., Amores-Salvadó, J. and Navas-López, J.E. (2016), "Environmental management systems and firm performance: improving firm environmental policy through stakeholder engagement", *Corporate Social Responsibility and Environmental Management*, Vol. 23 No. 4, pp. 243-256.
- Mathison, S. (1988), "Why triangulate?", *Educational Researcher*, Vol. 17 No. 2, p. 1317.
- Mavlutova, I. and Babauska, S. (2013), "The competitiveness and balanced scorecard of health care companies", *International Journal of Synergy and Research*, Vol. 2 No. 2, pp. 131-148.
- Möller, A. and Schaltegger, S. (2005), "The sustainability balanced scorecard as a framework for eco-efficiency analysis", *Journal of Industrial Ecology*, Vol. 9 No. 4, pp. 73-83.
- Morse, J.M. (2000), *Determining Sample Size*, Sage Publications Sage CA: Thousand Oaks, CA, 1049-7323.
- Naylor, C. and Appleby, J. (2012), "Sustainable health and social care: connecting environmental and financial performance", 1857176340, King's Fund.
- Neely, A.D., Adams, C. and Kennerley, M. (2002), *The Performance Prism: The Scorecard for Measuring and Managing Business Success*, Financial Times/Prentice Hall, London.
- Perrini, F. and Tencati, A. (2006), "Sustainability and stakeholder management: the need for new corporate performance evaluation and reporting systems", *Business Strategy and the Environment*, Vol. 15 No. 5, pp. 296-308.

- Qian, W., Burritt, R. and Monroe, G. (2011), "Environmental management accounting in local government", *Accounting, Auditing and Accountability Journal*, Vol. 24 No. 1, pp. 93-128.
- Qu, S.Q. and Dumay, J. (2011), "The qualitative research interview", *Qualitative Research in Accounting and Management*, Vol. 8 No. 3, pp. 238-264.
- Sands, J.S., Rae, K.N. and Gadenne, D. (2016), "An empirical investigation on the links within a sustainability balanced scorecard (SBSC) framework and their impact on financial performance", *Accounting Research Journal*, Vol. 29 No. 2, pp. 154-178.
- Sargeant, J. (2012), "Qualitative research part II: participants, analysis and quality assurance", The Accreditation Council for Graduate Medical Education Suite 2000, 515 North State Street, Chicago, IL, 60654, 1949-8349.
- Sinha, A. (2006), "Balanced scorecard: a strategic management tool".
- Shapiro, K., Stoughton, M., Graff, R. and Feng, L. (2000), *Healthy Hospitals: environmental Improvements through Environmental Accounting*, Tellus Institute, Boston, MA.
- Smith, M. and Loonam, J. (2016), "Exploring strategic execution: a case study on the use of the balanced scorecard within an Irish hospital", *Journal of Strategy and Management*, Vol. 9 No. 4, pp. 406-428.
- Soysa, I.B., Soysa, I.B., Jayamaha, N.P., Jayamaha, N.P., Grigg, N.P. and Grigg, N.P. (2016), "Operationalising performance measurement dimensions for the Australasian nonprofit healthcare sector", *The TQM Journal*, Vol. 28 No. 6, pp. 954-973.
- Stewart, D. and Klein, S. (2016), "The use of theory in research", *International Journal of Clinical Pharmacy*, Vol. 38 No. 3, pp. 615-619.
- Sutantoputra, A.W., Lindorff, M. and Johnson, E.P. (2012), "The relationship between environmental performance and environmental disclosure", *Australasian Journal of Environmental Management*, Vol. 19 No. 1, pp. 51-65.
- Thomson, I., Grubnic, S. and Georgakopoulos, G. (2014), "Exploring accounting-sustainability hybridisation in the UK public sector", *Accounting, Organizations and Society*, Vol. 39 No. 6, pp. 453-476.
- Trotta, A., Cardamone, E., Cavallaro, G. and Mauro, M. (2013), "Applying the balanced scorecard approach in teaching hospitals: a literature review and conceptual framework", *The International Journal of Health Planning and Management*, Vol. 28 No. 2, pp. 181-201.
- Van de Wetering, R., Batenburg, R., Versendaal, J., Lederman, R. and Firth, L. (2006), "A balanced evaluation perspective: picture archiving and communication system impacts on hospital workflow", *Journal of Digital Imaging*, Vol. 19 No. S1, pp. 10-17.
- Van der Woerd, F. and van Den Brink, T. (2004), "Feasibility of a responsive business scorecard – a pilot study", *Journal of Business Ethics*, Vol. 55 No. 2, pp. 173-186.
- Vesty, G.M. (2004), *A Case Study of the Balanced Scorecard in Public Hospitals*, Victoria University of Technology.
- Victorian Auditor-General's Office (2012), "Energy efficiency in the health sector", Victoria, available at: [www.audit.vic.gov.au/publications/2012-13/20120912-Energy-Health-Sector/20120912-Energy-Health-Sector.html](http://www.audit.vic.gov.au/publications/2012-13/20120912-Energy-Health-Sector/20120912-Energy-Health-Sector.html) (accessed 10 April 2017).
- Vigneau, L., Humphreys, M. and Moon, J. (2015), "How do firms comply with international sustainability standards? Processes and consequences of adopting the global reporting initiative", *Journal of Business Ethics*, Vol. 131 No. 2, pp. 469-486.
- Wynder, M. (2010), "Chemico: evaluating performance based on the balanced scorecard", *Journal of Accounting Education*, Vol. 28 Nos 3/4, pp. 221-236.
- Yuen, P.P. and Ng, A.W. (2012), "Towards a balanced performance measurement system in a public health care organization", *International Journal of Health Care Quality Assurance*, Vol. 25 No. 5, pp. 421-430.
- Zelman, W.N., Pink, G.H. and Matthias, C.B. (2003), "Use of the balanced scorecard in health care", *Journal of Health Care Finance*, Vol. 29 No. 4, pp. 1-16.

**Appendix. Indicative interview questions**

- To what extent does your organisation use the BSC?
- Can environmental elements be reported within the hospital's BSC?
- Can you describe your experience in regards to potential ways of incorporating the environmental dimension into the BSC in your organisation?
- Should the environmental dimension be subsumed under the existing perspectives of the BSC?
- There is some evidence that suggests that incorporating environmental measures under one or more existing perspectives undermines the significance of the environmental issues. Can you make a comment on this statement?
- Where should the environmental elements appear in the BSC in your organisation?

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