MANAGING ENVIRONMENTAL AND ECONOMIC PERFORMANCE: A REVIEW OF THEORY AND PRACTICE ON PERFORMANCE MEASUREMENT

Stephanie PhangTsu Way
A.K. Siti Nabiha
Dayana Jalaludin
Universiti Sains Malaysia

Abstract
As businesses struggle to maintain sustainability, a great deal of interest has focused on the issues of performance measurement systems. This paper provides a literature review on the evolution of performance measurement systems, from the traditional performance measures to the sustainable balanced scorecard. More importantly, this paper highlights the vital role of sustainable balanced scorecard as a tool that manages both economic and environmental performance. Majority of the existing sustainable balanced scorecard studies were found to be of normative nature giving limited information on how the integration process between economic and environmental dimensions is being carried out via balanced scorecard. Future research is needed to enhance the understanding of the role of the sustainable balanced scorecard as an important tool in the management of economic and environmental performance in the organization.

Keywords: Balanced Scorecard, Environmental management, Sustainability, Eco-efficiency

Introduction
It is undeniable that the popularity of balanced scorecard has tremendously increased since it was first proposed by Kaplan and Norton in 1993. As we know, the main aim of balanced scorecard was to address the limitations of the traditional performance (PMS), which were criticised for their narrow focus on accounting measures. The latest survey on balanced scorecard utilization conducted across five continents found that it is now being ranked as the top five most used management tools, and the number one tool used by managers in Europe, Middle East and Africa (Le & Associates, 2013).

Growing environmental awareness over the last decade has led to corporate sustainability dominating the policy statements of many organisations. The concept, first coined by Brundtland in 1987, has resulted in organisations implementing environmental management systems to manage and control their environmental and social
Managing Environmental And Economic Performance. But both environmental and social sustainability remain separated from traditional core business strategies and management systems, which are largely geared towards financial performance indicators (Dyllick and Hamschmidt, 2000).

A big plus of the balanced scorecard approach to performance management is its ability to accommodate a range of objectives, balancing financial and non-financial, short-term and long-term, as well as quantitative and qualitative success measures (Moller and Schaltegger, 2005). These benefits have underpinned research that incorporates environmental and social goals by altering and extending the balanced scorecard, creating a sustainability balanced scorecard (SBSC) (Figge et al., 2002; Wagner, 2007) or “green” balanced scorecard (Lansiluoto and Jarvenpaa, 2008). Some sustainability balanced scorecard models have incorporated environmental and social objectives into existing balanced scorecard perspectives, while others have redesigned an entirely new sustainability balanced scorecard based on selected environmental and social objectives (Figge et al., 2002).

The objectives of this paper are to investigate the evolution of performance measurement systems through to the introduction of the sustainability balanced scorecard, and to review empirical studies and identify research gaps.

The paper first discusses traditional performance management systems, including balanced scorecard as a performance measurement system and strategy implementation tool. It addresses, in brief, the fundamentals of performance management systems and then works towards the balanced scorecard and lastly the sustainability balanced scorecard. Following are the evolution of the balanced scorecard into the sustainability balanced scorecard, and findings and research gaps from previous empirical studies.

Literature Review
What is Performance Measurement?

One of the most quoted performance measurement definitions is by Neely et al. (1995), “Performance measurement is a topic often discussed but rarely defined.” Their paper went on to propose definitions for performance measurement, performance measures and performance measurement systems.

Performance measurement can be defined as the process of quantifying the efficiency and effectiveness of action. Where else a performance measurement system is being defined as the set of metrics used to quantify both efficiency and effectiveness of actions.

The literature on performance measurement is most prolific during two phrases; the first phrase started in 1880s and the second phrase in the late 1980s (Ghalayani and Noble, 1996, as cited in Gomes, Yasin, and Lisboa, 2004). The first phrase was based on cost accounting orientation, which aimed to help managers appraise the relevant costs of operating their firms. Later, this method was adapted to incorporate other financial measures, such as profit and return on investment.
By the 1960s, researchers had developed traditional management accounting systems that focused on financial measures such as traditional budgeting, costing and variances analysis, and cost volume profit. The focal point of these developments was to monitor organisational costs. These ideas were supported by Nanni et al. (1992), and Ballantine and Brignall (1996), who saw them as a means of maintaining organisational control and financial goals for hierarchical manufacturing organisations (Hussain, 2005).

**Limitations of the Traditional System**

As existing performance measurement systems originated from centuries-old accounting systems (Neely et al., 1995), they have been characterised as being financial-based, internally focused, backward looking, and more concerned with local department performance rather than overall business performance. Financial measures such as profit, cash flow, and return on investment are used to evaluate overall business health and the performance of employees (Yee-Ching Lilian Chan, 2004).

The narrow financial-based focus of performance management systems has resulted in widespread criticism (Kaplan, 1983), with critics alleging that traditional financial-based performance measurement systems failed to measure and integrate all the factors that are crucial to business success (Kaplan, 1983, 1984). A turning point occurred in the mid-1980s when Johnson and Kaplan (1987, as cited Kaplan and Norton, 1992) authored *Relevance Lost – The Rise and Fall of Management Accounting*, which highlighted the need for better integration of performance measurements and increased focus on continuous improvement rather than minimization of variance. They also criticised traditional performance measurement systems for ignoring customers and their needs. Similarly, McNair and Mosconi (1987) emphasized the need to develop performance measurement systems that integrate financial and non-financial measures which are aligned to the success of the business strategy. Santori and Anderson (1987) have also stressed the importance of non-financial measures in monitoring performance of and motivating staff in an organisation. Thus, by late the 1980s, frameworks that attempted to present a wider view of performance measurement started to surface (Cross and Lynch, 1989).

**Towards More Integrated Performance Measurement Models**

High competitive pressures and changing patterns of external demands, coupled with limitations of traditional performance management systems, has led scholars to consider more non-financial based measures (Neely, 1999). This change in focus marked the beginning of the second evolutionary phrase, which addressed the changing needs of global business activities and responded to the criticisms of traditional performance measurements. The outcome was an increased interest in developing more balanced, multidimensional...
performance measurement systems. Table 1 shows a summarised evolution of performance measurement systems from the 1880s to early 2000.

In the 1990s, performance measurement systems and frameworks surfaced that offered integrated solutions or methodologies to resolve specific issues (Taticchi et al., 2010). One of the most popular models was the balanced scorecard, and it remains one of the most cited performance measurement systems, which leads to the conclusion that the balanced scorecard is widely accepted among scholars and practitioners (Gomes et al., 2004).

### Table 1: The Evolution of Performance Measurement Systems

<table>
<thead>
<tr>
<th>Measures</th>
<th>Main Focus</th>
<th>Key Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880</td>
<td>Early accounting systems</td>
<td>Cost accounting</td>
</tr>
<tr>
<td>1960</td>
<td>Financial</td>
<td>Accounting Earnings, Earning Per Share, ROI, NPV</td>
</tr>
<tr>
<td>1980</td>
<td>Financial/Managerial</td>
<td>Unit costs, Joined Budgets, Operating Profits, Cash Flow</td>
</tr>
<tr>
<td>1990</td>
<td>Financial / Non-financial</td>
<td>Strategic Measurement Analysis and Reporting Technique (SMART); The Supportive Performance Measures (SPA); Performance Measurement Questionnaire (PMQ); Performance Measurement System in Service Industry, BSC; The Service Profit Chain, Integrated Performance Measurement Systems (IPMS); The Comparative Business Scorecard, Performance Prism</td>
</tr>
<tr>
<td>Early 2000</td>
<td>Financial / Non-financial &amp; Sustainability</td>
<td>Sustainable Balanced Scorecard (SBSC), Sustainable Performance Measurement (SPM)</td>
</tr>
</tbody>
</table>

Source: Anbalagan, n.d.; Taticchi, Tonelli and Cagnazzo, 2010; Figge et al., 2002; Fiksel et al., 1999.

### The Balanced Scorecard (BSC)

The concept of the balanced scorecard, developed in the early 1990s, is based on the assumption that the efficient use of investment capital is no longer the sole determinant for competitive advantage, but soft factors, such as intellectual capital, knowledge creation, or excellent customer orientation, are equally important (Kaplan and Norton, 1992). Hence, the balanced scorecard combines non-financial
and financial measures in an internal corporate reporting process so that managers can assess the efficiency of strategic plans and actions. The main purpose of the balanced scorecard is to translate the business strategies into strategic objectives where the strategic objectives are cascaded down in a hierarchical system of perspectives. Accordingly, there is an intertwine link between these perspectives which eventually lead to economic performance improvements.

The term “balanced” refers to a “balance between external measures for shareholder and customers, and internal measures for critical business processes, innovation, learning and growth. The measures are balanced between the results from the past effort and the measures that drive future performance. Thus the scorecard is balanced between objective, easily quantified outcome measures and subjective, judgmental and performance driven for the outcome measures” (Kaplan and Norton, 1996; Kaplan, 2013).

Generally, there are four main perspectives in the balanced scorecard i.e. financial, customer, internal business processes and learning and growth. In each of the perspectives, there will be specific objectives and indicators. The indicators are the targets to be achieved that would eventually lead to the achievement of the specific objectives of the perspective.

As mentioned above, the financial perspective is the endpoint of the cause and effect relationships amongst all other perspectives. In the financial perspective, the long term economic strategies are defined explicitly through short term and long term indicators that reflect economic achievements. The next perspective is the customer perspective which is often relate as the main cause of economic achievement as it focuses on client base issues such as differentiation strategies and value creation. The indicators of the customer perspective would reflect customer related achievements such as market share, consumer satisfaction trends, and product or service delivery time. Next is the internal business process perspective which is mainly concern about the operational side of the organization. The indicators in this perspective must be able to capture information that would describe whether efficiency and effectiveness have been achieve throughout the operational side of the business. Examples of the indicators include measures of service and product quality, production cycle time, and process quality yields. Last but not least is the learning and growth perspective which focuses on the foundation of the organization as a whole. The concern of this perspective is on the creation of organisational value particularly through employees and innovative practices. Among the indicators of this perspective are employee cross-training and skill levels, employee turnover, patents applied for and received, and other product development.
Balanced scorecard can be categorised into three generations. The first generation was developed by Kaplan and Norton (1992) to assess the effectiveness of financial and non-financial dimensions. In addition to the financial dimension, customer satisfaction, internal processes, and learning and growth balanced the financial measures.

Later, in 1996, Kaplan and Norton advocated causal links between the perspectives which highlighted the organisation’s targeted results and hypothesized the means by which these could be achieved. In layman terms, for example, an organisation that trains their employees well improves the quality of service and customer satisfaction, which results in more purchases and profitability. Thus, the second version of the balanced scorecard was a multidimensional performance measurement system that linked strategic outcomes through cause and effect relationships (Kaplan and Norton, 1996, as cited in Tung et al., 2011).

The balanced scorecard was further developed, with additional perspectives added (Kaplan and Norton, 2001). The third generation attempted to address sustainability issues, which now receive attention from various stakeholders (customer, suppliers, local communities, investors, and government) and affect an organisation’s bottom-line, and was formulated into sustainability balanced scorecard (Epstein and Wisner, 2001; Figge et al., 2002; Langfield-Smith et al., 2009). This version is appropriate when sustainability is an important part of an organisation’s business strategy and competitive advantage (Epstein, 2008; Kaplan and Norton, 1996).

From this discussion, balanced scorecard has developed into a highly regarded performance measurement tool (Atkinson et al., 1997; Rigby and Bilodeau, 2009), which provides managers a method of measuring different aspects of performance and linking these to its overall strategy.

**Empirical Studies on BSC**

Most previous studies on the balanced scorecard have discussed the balance of scorecard perspectives, and how managers use scorecard measures to evaluate performance (Chow, Ganulin, Haddad, and Williamson, 1998; Ittner and Larcker, 1998; Mooraj, Oyon, and Hostettler, 1999). More recently, researchers have investigated industry applications of balanced scorecard (Frigo, 2002; Libby et al., 2004; Lipe and Salterio, 2000 as cited in Ju Yup Lee, 2012), and organisational performance outcomes from balanced scorecard implementation (Frigo, 2002; Hoque and James, 2000; Malina and Selto, 2001). The most common industry of study has been manufacturing, and, as seen in Table 2, many of the organisations discussed in balanced scorecard literature are from that field.
The majority of study have reported that balanced scorecard implementation is positively associated with improved organisational performance. For example, Malmi (2001) reported that balanced scorecard improves areas such as logistics, delivery reliability, warehouse turnover, planning and control systems, as well as organisation growth. Similarly, in their study on the effectiveness of the balanced scorecard in the US banking industry, Davis and Albright (2004) found that branches that adopted balanced scorecard had better financial performance than those branches using traditional performance systems. An advantage of balanced scorecard is that it can also deliver qualitative results. Epstein and Manzoni (1998) noted that the balanced scorecard "allows managers to keep an eye on the way performance is achieved and offers the organisation a clear way to communicate and reinforce its strategy", and Malina and Selto (2001) stated that organisations that adopt the balanced scorecard are better at developing, communicating and implementing organisational strategies.

An organisation’s characteristics affect balanced scorecard effectiveness, in particular the organisation’s size and the intensity of balanced scorecard integration into business processes (Hoque and James, 2000). They suggest that large firms make better use of the balanced scorecard than small firms. In their survey of Australian manufacturing firms, Yu et al. (2008) revealed that different forms of the balanced scorecard are employed by different types of organisations. For example, organisations vary the number of perspectives with the addition of perspectives such as safety, environmental, behavioural and ethical measures/targets.
Sustainability Balanced Scorecard (SBSC)

One of the biggest challenges now confronting organisations is to realise the contribution of corporate sustainability to the sustainable development of the economy and society (Burritt and Schaltegger, 2010). Organisational behaviour seems to be aligned with this aim, as the attitude of ‘fully abide by the law and meet obligations’ is giving way to a willingness to ‘accept a higher level of obligation and moral responsibility than that demanded by mere compliance with the law’ (Robin, 2006). Organisations are slowly shifting their focus towards the challenge of implementing corporate sustainability.

Corporate sustainability encompasses three dimensions: ecological, social and economic. Achieving sustainable development requires organisations to improve in all the three dimensions simultaneously because, according to Bieker et al. (2001, as cited in Leon-Soriano, Munoz-Torres and Chalmeta-Rosalen, 2010), bidirectional links, known as “The three sustainable cases”, hold all three dimensions at the same importance level for sustainability. However, most organisations focus on the “Green” case, and attempt to link economic sustainability with ecological sustainability by measuring economic output versus environmental impact (Schaltegger and Sturm, 1994). By measuring and reporting the eco-efficiency for its products or services, an organisation has the means to monitor and report overall sustainability performance, and improve corporate dialogue and communication with stakeholders.

One of the key weaknesses in the approach taken by most organisations is the lack of integration of environmental, social, and economic management systems. Based on empirical findings, most corporate strategies disregard issues of corporate sustainability (Bieker and Waxenberger, 2002). Furthermore, to complicate matters, environmental measures are quantitative (for example, emission of greenhouse gas generated is measured in tonnes) but not calculated in monetary terms (Butler, Henderson and Raiborn, 2011; Schaltegger and Moller, 2012), making it more difficult to integrate into traditional financial systems.

To overcome these issues, a promising approach to measuring organisational eco-efficiency is to include environmental and social dimensions into a balanced scorecard, producing a sustainability balanced scorecard (Figge et al., 2002; Hubbard, 2006; Schaltegger and Lukede-Freund, 2011; Wagner, 2007). The first attempts to develop a sustainability balanced scorecard were as a planning tool (Bieker et al., 2001 as cited in Leon-Soriano, Munoz-Torres and Chalmeta-Rosalen, 2010), which could improve the transparency of potential actions that added value in the social and ecological aspects. In addition, the early framework was used to describe causalities between economical, ecological and social dimensions (Bieker and Waxenberger, 2002).

This research resulted in alterations and extensions that incorporated environmental and social goals, creating the sustainability
balanced scorecard (Figge et al., 2002; Wagner, 2007) or “green” balanced scorecard (Lansiluoto and Jarvenpaa, 2008). There are a number of advantages to including environmental and social dimensions as part of the scorecard. It now takes into account the perspectives of internal and external stakeholders, and can address both short-term and long-term issues. Secondly, the balanced scorecard is already entrenched in many organisations, so it is easier to build on it rather than try to introduce a new model. Thirdly, as argued by Figge et al. (2002), the balanced scorecard is based on a connected set of measures that guide the realisation of an organisation’s business goals, which is crucial to change organisational behaviour and achieve sustainability outcomes. The ability of the sustainability balanced scorecard to translate sustainability measures into business practices and competitive strategy to its sustainable outcomes that highlights the relationship between sustainability and profitability (Butler et al., 2011).

Alternative views, from scholars such as Bieker and Waxenberger, 2002, and van Der Woerd and van den Brink, 2004 (as cited in Leon-Soriano, Munoz-Torres and Chalmeta-Rosalen, 2010), have argued that the balanced scorecard was developed to link financial goals with other corporate dimensions, so it already able to incorporate sustainability or corporate social responsibility measures. Thus, it is worth taking note that a broader approach, possibly beyond scorecard implementation, is essential to reach sustainability.

**Methods of Developing a SBSC**

Figge et al. (2002) proposed three possibilities in integrating environmental and social aspects into the existing dimensions of the balanced scorecard. Firstly, both environmental and social aspects can be integrated in the four dimensions. Secondly, an additional dimension dealing with environmental and social aspects can be added. Thirdly, a specific environmental and social scorecard can be developed. Regardless of the method, the end aim is to have a ‘greener’ balanced scorecard, and all three have been discussed in the literature. The majority of the research has focused on integrating environmental and social sustainability objectives into the conventional balanced scorecard, with alternative opinions presenting options to add a single dimension, such as environment, or highlight the relationship between two dimensions (eco-efficiency), or focus on a single issue (such as strategic philanthropy) (Hansen and Schaltegger, 2012). Table 3 below summarises the three methods.
Table 3: Methods of developing a SBSC

<table>
<thead>
<tr>
<th>Method</th>
<th>Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integration into four basic perspectives</td>
<td>Environmental and social aspects are subsumed under the existing four perspectives, lagging and leading indicators, targets and measures. Captures strategically relevant environmental and social aspects that are already integrated in the market system.</td>
</tr>
<tr>
<td>Formulation of a fifth, non-market perspective</td>
<td>Strategically relevant but not market integrated environmental and social aspects are included in an additional non-market perspective. This refers to aspects which are of strategic relevance and influence a firm’s success but are not reflected in the basic four perspectives. Therefore, lagging and leading indicators, targets and initiatives have to be formulated and linked towards the financial perspective.</td>
</tr>
<tr>
<td>Development of an extra sustainability scorecard</td>
<td>Deduction of a derived environmental and social scorecard. Optional second step that is only possible as an extension of addition or subsumption. Used to coordinate, organise and further differentiate environmental and social aspects due to their strategic relevance and position in the cause-and-effect chains.</td>
</tr>
</tbody>
</table>

Source: Schaltegger and Lukede-Freund, 2011

Process of Formulating a SBSC

Based on the previous reasoning, the process of formulating a sustainability balanced scorecard has to meet a number of basic requirements. Firstly, the process must lead to the integration of environmental and social factors into business management framework. A sustainability balanced scorecard that meets the specific characteristics and requirements of an organisation’s strategy and the environmental and social needs of a business unit is not generic. The second requirement is that the process needs to formulate a business unit-specific scorecard. Thirdly, the strategic relevance of the business unit’s environmental and social needs must be taken into account. This includes the question whether the introduction of an additional non-market perspective is necessary.

Developing a sustainability balanced scorecard while meeting these requirements is best achieved through a three-step process.
(Figge et al., 2002). First is choosing a business unit, which has a strategy and an opportunity to impact sustainability outcomes. Second, is identifying the environmental and social issues of the business unit. Third is deciding the specific linkages of these issues to the business unit’s strategy. Figure 1 below gives an overview of the whole process.

Figure 1: Three-step Process of Formulating a Sustainability Balanced Scorecard

**Empirical Studies on SBSC**

A number of studies have examined the sustainability balanced scorecard. Most notable is the systematic review of both conceptual and empirical studies by Schaltegger and Hansen (2012), which revealed six key emerging themes in sustainability balanced scorecard from 1995 to 2010. Table 4 shows the main emerging themes, the sub-topic covered, and a brief description of the research.
Table 4: Key Emerging Themes in The Context of Sustainability Balanced Scorecard

<table>
<thead>
<tr>
<th>Topic</th>
<th>Sub topic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention/type of use</td>
<td></td>
<td>Facilitation of strategy development, organisation change, and strategy communication vs. performance management and measurement vs. mere information system</td>
</tr>
<tr>
<td>Architecture</td>
<td>Issues addressed</td>
<td>Overall sustainability to selected environmental or social issues</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Various modifications introduced: integration of environmental and social strategic objectives into a conventional perspective</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reframing/broadening perspective</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adding dedicated environmental/social perspectives</td>
</tr>
<tr>
<td></td>
<td>Perspective</td>
<td>Rather conventional hierarchy vs. top-level perspectives or even network architecture</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Two camps: Strict cause and effect chains vs. more liberal linkages or even systematic relationships</td>
</tr>
<tr>
<td>Performance indicators</td>
<td>Nature</td>
<td>Compilations of large lists of generic environmental/social indicators vs. empirically derived company specific indicators</td>
</tr>
<tr>
<td></td>
<td>Measurement peculiarities</td>
<td>Addressing impact-level indicators sometimes requires extended measurement period and cooperation with external parties</td>
</tr>
<tr>
<td>Development process</td>
<td>Prerequisites</td>
<td>Building SBSC from scratch vs. the assumption of the existence of a prior (conventional) BSC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Overall, there are five vital steps to consider:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>a) compose a comprehensive list of environmental and social aspects potentially being strategically relevant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) categorise all aspects into strategic core issues or hygiene factors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c) establish cause and effect-chains between performance drivers and strategic core issues</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d) summarise above results into a</td>
</tr>
</tbody>
</table>
“Strategy map”
e) develop concrete key performance indicators, based on performance drivers

<table>
<thead>
<tr>
<th>Cascading Organisational units</th>
<th>BSC cascaded from corporate level to division, to departments and support functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individuals</td>
<td>Further cascading to individual managers/staff; link to individual performance appraisal possible</td>
</tr>
<tr>
<td>Links to other systems</td>
<td>Performance indicators should be linked to, or make use of, data from sustainability accounting systems, such as environmental management systems and HR systems</td>
</tr>
<tr>
<td>Reporting</td>
<td>Though originally not meant as a reporting system, some companies do report BSC results</td>
</tr>
</tbody>
</table>

Source: Schaltegger and Hansen, 2012

Other empirical studiesthat have investigated the integration of environment and social dimensions into the balanced scorecard include Dias-Sardinha, Reinjders, and Antunes (2002); Dias-Sardinha and Reijnders (2005); Epstein and Warner (2001); Figge et al. (2002); and Lansiluoto and Jarvenpaa (2008). These studies listed number companies that have implemented a sustainability balanced scorecard, including British Telecom (communications), Volkswagen (automobile), Hamburg Airport (logistics) and Novartis (pharmaceutical) (Wagner, 2007), validating that the balanced scorecard is capable of guiding the integration in a way that brings positive effects of environmental management on economic performance or its drivers (Wagner, 2007). One company, Hamburg Airport Corporation in Germany changed its vision and strategic objectives to support the development of a sustainability balanced scorecard, adding a location perspective to the four classical perspectives. By choosing to integrate environmental and social dimensions with its corporate strategy, Hamburg Airport Corporation was able to identify existing environmental and social issues which were not recognised before (Diaz-Guerrero et al., 2002; as cited in Schaltegger & Ludeke-Freund, 2011; Schaltegger & Ludeke-Freund, 2011). The outcomes were that Hamburg Airport defined value-oriented environmental and social measures that supported communication and better integration with general management and strategic objectives, and addressed crucial non-market issues were addressed, which legitimised their actions with stakeholders. Hamburg Airport continues to derive benefits from the sustainability balanced scorecard and, according to EMAS, still reports...
on environmental issues (Hamburg Airport Corporation 2008; as cited in Schaltegger & Ludeke-Freund, 2011).

Well known car manufacturer, Volkswagen, has also used the balanced score card to integrate environmental and social aspects with their R&D strategy and derive measurable indicators that are linked to corporate environmental and social performance goals. The integration phase was visualised with a strategy map that contained innovation and society perspectives. The corporate health, safety, and environment department of pharmaceutical manufacturer, Novartis, implemented a balanced scorecard in which the traditional four perspectives included environmental management measures. Their scorecard now provides integrated measures of its internal processes that meet the demands of all their stakeholders (Wagner, 2007).

These studies demonstrated that integrating balanced scorecard and environmental management may yield financial benefits from pollution prevention measures (Bartolomeo et al., 2000; Wagner, 2007). Lansiluto and Jarvenpaa (2008) pointed out that when an organisation recognises environmental issues, it can improve financial and environmental performance concurrently. They also acknowledged the balanced scorecard as a valuable tool for collecting and reporting environmental performance information. The study by Epstein and Wisner (2007) revealed a strong, positive relationship between a successful social and environmental strategy and corporate value. They explained that the process of implementing a sustainability balanced scorecard communicated to the organisation the importance of a sustainability strategy and the likely benefits from success—the organisation was able to maintain profitability and environmental and social accountability simultaneously, meeting the demands of corporate stakeholders plus the local communities (Epstein and Wisner, 2001).

Discussion

From the reviewed literature, some integration between balanced scorecard traditional and environmental aspects has occurred (Schaltegger and Hansen, 2012), but the available empirical studies were normative, and did not elaborate on how the integration process between environmental and social dimensions was carried out. For example, Lansiluto and Jarvenpaa’s (2008) study of a meat processing company reported the drivers and benefits of the integration process, but failed to explain the integration process in any detail. Further, the study by Dias-Sardinha and Reijnders (2005) focused only on the architecture and cascading issues, and proposed a thematic cascading balanced scorecard with strategic objectives cascading down from top level management to business units, and to departments. However, for the case of Hamburg Airport Corporation, the authors showed that the sustainability balanced scorecard, based on the theory of Figge et al. (2002), worked in practice and helped formulate strategic issues and performance drivers for their strategy programmes (Diaz Guerrero et al., 2002, as cited in Schaltegger and Ludeke-Freund, 2011).
While some of the reviewed studies reported a positive link between the integration of environmental and social aspects into balanced scorecard and economic performance, the literature fails to demonstrate positive outcomes (Wagner, 2007). The limited empirical knowledge in this area underpins the need for future research on the process of how organisations integrate environmental management aspects into their performance measurement systems, specifically the balanced scorecard, and the relationship between the integration of environmental aspects into balanced scorecard and corporate value.

Another gap in the literature is the lack of studies in environmentally-sensitive industries, which are categorized as industries where pollution control costs form one percent or more of total sales (Low and Yeats, 1992). The big player here is the oil and gas industry, one of the most polluting industries, and the major contributor to climate change and environmental degradation as it lives off exploiting non-renewable resources. Companies like BP and ExxonMobil have attempted to improve their reputation by engaging in environmental management practices that produce environment-friendly results in their sustainability reports (Schweitzer, 2011).

A major concern stemming from the research is that even though companies continue to report sustainability information, researchers claim that most companies fail to actively incorporate sustainability into general management systems (Elijido-Ten and Tjan, 2011). This is supported by a United Kingdom think tank that reported the majority of companies do not incorporate sustainability into their corporate strategy in reality (Watanatada, 2011). Even though one study, by Zingales and Hockerts (2003), showed that balanced scorecard can align objectives, targets, actions and processes, Royal Dutch Shell incorporated environmental and social issues into their corporate balanced scorecard, but more empirical research is much needed to corroborate these findings.

The service industry, especially the hotel sector, is another industry that has been neglected. A growing world economy and low cost travel options mean the service industry is more important in both developed and developing countries. Global GDP was 69.9 per cent in 2010 (World Development Indicators, 2013) and the hospitality sector was the fastest growing sector in service industry. Hospitality is tightly linked to environment protection. It is one of the biggest consumers of natural resources, generates tons of waste each year, but is often dependent on the health of the natural environment to attract customers (Graci and Doods, 2008). For example, the hotel sector annually releases between 160 and 200 kg of CO₂ per m² of room area, depending on the fuel mix used to provide energy (Hotel Energy Solutions, 2011).

While, like other industries, hospitality is under increasing pressure to ensure sustainable development, especially in maintaining the wellbeing of ecological systems, there is still a scarcity of research on sustainable...
balanced scorecard in developing countries. The few studies available (for example, Hilton Hotel by Huckestein and Duboff; as cited in Evans, 2005, and White Lodging Services by Denton and White, 2000) have not specifically focused on the implementation of sustainability balanced scorecard in hotels.

Taking into consideration the developments in performance measurement systems and the emergence of sustainability as an important business issue, the study of sustainability balanced scorecard is deemed important. Thus, research that explains the process of determining and selecting economic, ecological, and social indicators, integrating these into the balance scorecard, and linking to positive financial outcomes, will provide much needed evidence for successful implementation of sustainability balanced scorecard.

**Conclusion**

Researchers and practitioners have increasingly stated that traditional financial data no longer serve as leading indicators of organisation performance, and non-financial dimensions need to be integrated into performance measurement systems, such as balanced scorecard, to measure non-financial performance. Added to this is pressure for more sustainable business operations from various stakeholders. Recent work with the balanced scorecard tool has evolved it into a sustainable balanced scorecard.

Application of the sustainability balanced scorecard has aligned and integrated sustainability measures with corporate strategies, providing a framework for integrating non-financial measures into corporate operations and monitoring. Using this tool, organisations can implement sustainability strategy and link corporate business and sustainability objectives to programmes and clarify performance outcomes (Butler *et al*., 2011; Epstein and Wisner, 2007). Therefore, based on the extent literature reviewed, the sustainability balanced scorecard has the ability and flexibility to incorporate non-financial dimensions (including the social and environmental dimensions), to measure organisational performance, and to apply to organisation in a wide range of industries, including the service sector.

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