

**The Accounting for Sustainability
Group**

**Accounting for Sustainability
PART I: A review of academic
literature**

**A report from the Accounting for Sustainability Group convened by HRH The Prince
of Wales**

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1 A review of academic literature

1.1 Introduction

This section provides a brief overview of the emerging academic thinking and literature about accounting for sustainability and related issues. It begins with a short summary of the section's conclusions, followed by a discussion of the limitations of current accounting systems in considering non-monetary impacts, and a brief comment on the debate surrounding the definition of *sustainability* (necessary in order to develop guidelines of implementation.) The section continues with a review of the literature of non-market valuation, such as assessing ecological footprints, triple bottom line reporting and trends in environmental accounting. Finally there is a discussion of what this all means for accounting and corporate management and a brief description of sustainability reporting and possible future models of business development. The commentary and analysis that follows has been provided by the Saïd Business School, Oxford University.

1.2 Summary of Findings

There is clearly a growing interest among academics in the issues of sustainable accountancy and decision-making, as reflected in the growing volume of literature dedicated to these subjects. This is complemented by organisations' increased awareness of the importance of sustainable business practices, evidenced for example by the fact that in 2004 52% of the Global Fortune 250 produced voluntary environmental or sustainability reports. There is also a growing understanding that accountants have an important role to play, demonstrated by the work that is being done by the leading accountancy bodies to engage the profession in sustainability issues.

However, despite this growing profile, there is a lack of agreement among academics about the way forward, and there remain a number of barriers to the successful integration of sustainability into organisational processes.

One of the major challenges faced in the area of accounting for sustainability is the complexity and uncertainty of the subject matter, beginning with the lack of a clearly understood definition of "sustainable development". The generally accepted Brundtland definition – "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" – raises a variety of questions about the extent of our own needs and those of future generations. This is compounded by the difficulty faced in determining what level of connection in terms of time and geography there should be between an organisation and the environmental and social impacts it should account for. So, for example, should an organisation account for the impacts it may have several decades into the future? Finally, there are questions over the measurement of these impacts, with a variety of different approaches that organisations could employ.

Another challenge is the sometimes uneasy relationship between sustainability and businesses' ultimate aim, traditionally seen as capital growth for the benefit of shareholders. Although research has shown that pursuing sustainable business practices

can promote greater long-term profitability, this connection is not always obvious, and there is a question-mark over the extent to which organisations should consider factors that may not enhance their profit.

A practical difficulty to be faced is the fact that current accounting systems do not facilitate the inclusion of environmental and social factors external to an organisation's operations. Balance sheets consist of assets owned by the organisation and direct liabilities giving rise to an obligation the organisation is either legally required to settle or has voluntarily committed to paying. In general, these do not include environmental and social impacts.

As noted above, 52% of the Global Fortune 250 now produce environmental or sustainability reports, a 7% increase on the 2002 figure. The Global Reporting Initiative (GRI) provides best-practice guidelines for sustainability reporting, but these are not mandatory, and many organisations produce reports based on their own unique frameworks, which makes comparison very difficult.

Despite these difficulties, a variety of indicators and organisational structures that promote and reflect sustainability have been developed, and action is being taken. Indicators such as the Ecological Footprint help to conceptualise sustainability and provide a useful starting point to organisations beginning to consider their environmental impacts.

The report looks at four of the frameworks that have been developed to embed sustainability within organisational structures. The Triple Bottom Line combines economic, environmental and social considerations to promote eco-efficiency, fair trade and environmental justice. The Balanced Scorecard and Sustainability Balanced Scorecard use strategy maps to integrate sustainability into decision-making processes. The French Tableau de Bord is designed to give senior managers a global view of an organisation's operations and to include environmental indicators and performance measures. Finally, the Sustainability Assessment Model uses the concept of full-cost-accounting (i.e. translating all internal and external costs into financial values) to measure the sustainability of specific projects pursued by an organisation.

Overall, the academic literature shows that there are a variety of possible approaches to accounting for sustainability, but that there is a lack of general consensus as the best way forward. Further thought and discussion is needed to develop a system that will fully integrate sustainability into decision-making, accounting and reporting processes, building on the work that has already been done.

1.3 **The current system**

Since the Industrial Revolution, our rapid economic expansion has taken its toll on the planet and it seems fair to conclude that our economic system is not well-equipped to incorporate the environmental and social impacts of our activities. It is a system of rewards that creates incentives for maximising wealth in a highly competitive environment that assumes inputs to be limitless. It is based on the premise that it can be sustained only by constant growth and will eventually redistribute resources equitably within the burgeoning human population through greater and greater wealth generation

(1). National governments are now realizing the need to protect their environmental and social assets for the public good, although in doing this they still operate within a very short-term time frame. As a result, unsustainable activities are continuing unabated. Accounting has been evolving in parallel to these developments; however its philosophical principles (or basic tenets of economic theory) have remained largely unchanged (2). The economic model subscribed to by the majority of the advanced economies in which production is a function of labour and capital has resulted in a set of accounting principles that only requires business to reflect the consequences of its decisions in relation to assets that it owns and liabilities that it will settle directly. That is, factors that are internal to business. Current accounting practice does not require (or indeed allow), business to record the consequences of its actions on factors that are external to it. It is time to challenge these paradigms and offer alternative models of development and business management.

Firms directly interact with nature through their consumption of natural resources as well as having considerable capital at their disposal to ameliorate their impact. This partially explains the growing trend to become more involved with sustainability measurement and reporting (2, 3). Increasingly recognising that sudden environmental changes and shocks can damage even business operations, a growing number of businesses appear to be interested in designing industrial processes and buildings that perform in a more environmentally friendly manner.

1.4 **Current forms of financial reporting**

The form and content of today's financial statements are determined by the accounting standards set by various professional bodies globally. In particular, the world's two largest standard setters, the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB).

There are various established elements of existing financial statements which are used in measuring an entity's financial position and financial performance. These include its assets, liabilities, equity, income and expenses. The definitions of these elements of conventional financial statements are such that they are not capable of reflecting all the consequences of an entity's activities. In particular, items that meet the definitions of the elements described may only be recognised if:

- it is probable that any future economic benefit associated with the items will flow to or from an entity; and
- the item has a cost or value that can be measured reliably.

So, for example, a liability is generally defined as a present obligation arising from past events, the settlement of which is expected to result in an outflow from the entity of resources embodying economic benefits. Unless the entity's activities give rise to a present obligation which it will have to settle, the liability cannot be recognised in its financial statements.

An obligation in this context may be legally enforceable or “*arise from normal business practice, custom and a desire to maintain good business relations or act in an equitable manner*”. Where the obligation is not legally enforceable it is sometimes referred to as a constructive obligation. A liability is only recognised as a constructive obligation when there is sufficient evidence that the entity will honour the commitments that it has made. In other words, a liability can only be recognised if it is legally enforceable or if the entity reporting it has made a commitment to making a payment voluntarily. Liabilities are recognised for environmental factors but only if there is a legal obligation to make good any damage caused.

It will be apparent from the highly summarised analysis set out above that frameworks in which existing accounting principles and standards are being developed have a narrow purpose even if the financial reports to which they are applied will be of interest to a variety of users.

1.5 **Current investment appraisal techniques**

The narrow basis on which financial statements are currently prepared influences how business decisions are taken. That is because financial performance is measured with reference to changes in recorded assets and liabilities and, as noted above, the assets and liabilities in question are restricted to those where the associated cash flows are attributable to the reporting entity.

Many of the most common forms of investment appraisal make use of a concept based on the time value of money. A fundamental aspect of such analysis is that £1 received today is worth more than £1 received tomorrow, and £1 spent today costs more than £1 spent tomorrow. Consequently, cash flows which are not expected to arise for some time are attributed less value than cash flows that are expected to arise in the short term. Therefore, even if environmental consequences are included in the analysis they would be accorded less significance than shorter term cash flows.

1.6 **An alternative perspective**

The business world is truly global and society is becoming more aware of the vulnerability of the planet to unchecked exploitation. We have seen that accounting as a discipline does not seem to be keeping pace with these changes.

It is important to remember that accounting is fundamentally a means to an end, it is a process by which knowledge, a human construct of reality neither “absolute or complete” (5), is communicated and perhaps guided by a “conceptual network” (6) of ideas and theories (7, 8). It is a means of communication, but like the media today, it is selective and value-laden.(9, 10-13).

Accounting can be characterised as “a process of attributing financial values and rationales to a wide range of social practices, thereby according them a specific visibility, calculability and operational utility” (14). Hence, the power of accounting lies in its choice of what to calculate and communicate. At the same time, it has developed in the

context of existing business cultures, methods of management and organisational structures (8, 15, 16); therefore it should be treated as a symptom not a cause of our inability to integrate social and environmental impacts adequately.

Economics provides a way of conceiving the measurement of human and social welfare, although with an understandable bias for welfare measures in monetary terms. Further, basic economic theory assumes that a vibrant and/or desirable economy is one that is constantly growing (1); therefore anything seen as stifling economic growth will be detrimental for social welfare.

Yet surprising for some, this has not been so since time immemorial. In fact it is thanks to neo-classical economists, who rejected the classical economists' valuation methods on land, capital and labour, that we have valuations of marginal utility and reliance on technological innovation that allow us to have theoretically unlimited growth.

We do not tax or adequately value natural resources currently because of neo-classical economists' assumptions that these would be limitless and therefore unimportant. We see this translated to the micro-economic level as well, where production is only seen as a function of labour and capital and where resources are viewed as "gifts from nature" (17). Daly (2006) suggests not only that this perspective is inherently wrong but also that peak oil is an excellent example of why this paradigm needs to be shifted dramatically.

It is time to understand that our economy is reliant on the biosphere and subject to the laws of thermodynamics (1). These need to be considered as constraints acting on our economy; namely *outer* constraints, which relate to the availability of raw inputs and natural capital, and *inner* constraints, which are dictated by availability of commercial energy. Also, we must appreciate that we are not having a marginal effect on the planet and thus cannot expect to ameliorate our performance at the margins. For instance, at present, twenty percent of the human population is consuming about 40 percent of global primary productivity (e.g. global photosynthetic activity) (18). Hence Daly (2005) further argues that our adherence to current measures of wealth generation (i.e. GNP) is ignoring the fact that society may well be growing poorer, with environmental and social costs increasing more rapidly than marginal economic growth. Thus it seems that when approaching the global economy as a constrained-closed system, the assumption we can continue to increase natural resource and energy consumption indefinitely appears far-fetched at best.

Nevertheless, this idea of constant growth has been filtered down to the individual firm level. The goal of profit maximisation through maximising sales and market share is considered to be its basic tenet in order to provide benefits for shareholders. In a sustainable business environment though, this could be problematic.

Ideally sustainability itself must become the primary aim of all businesses. In addition, we are beginning to realise that we cannot forecast the outcome of continued, unchecked profit maximisation because we are not yet able to quantify the effects on the planet. Here is where the role of accounting as the "objective" reporting tool is so crucial.

There are hopeful signs that the accounting profession recognises that it has an important role to play. For example:

- The Association of Chartered Certified Accountants (ACCA) and the Chartered Institute of Management Accountants (CIMA) have published a variety of papers that consider how to include sustainability measures in traditional financial reporting, including Full Cost Accounting, Triple Bottom Line reporting and Balanced Scorecard methodologies as well as a selection of hybrid approaches. It is fair to say, however, that as yet there has not been universal agreement on a successful approach.
- The Global Reporting Initiative (GRI) is an organisation that aims to make reporting on economic, environmental and social performance by all organisations as comparable and routine as financial reporting.
- The Institute of Chartered Accountants in England and Wales (ICAEW) has, as part of its Information for Better Markets series of publications, provided guidance to its members on the type of services likely to be required in a world where sustainability reporting is commonplace.
- The Fédération des Experts Comptables Européens (FEE) has been active in the area of sustainability accounting since 1993 and has produced a number of studies and publications on the subject.
- The Chartered Institute of Public Finance and Accountancy (CIPFA) has published *Sustainability: A Reporting Framework for the Public Services*, a model of sustainability reporting that can be applied by any public sector organisation when considering and reporting on organisational and service-level sustainability.
- IFAC, The International Federation of Accountants, has created two sustainability working groups has launched a 3 year sustainability programme via its Professional Accountants in Business Committee, and has issued guidance on environmental management accounting and to professional accountants globally as to the nature of their professional interaction with the sustainability debate.

1.7 **Moving forward: can we agree what sustainability means?**

“Environmentalists want environmental systems sustained. Consumers want consumption sustained. Workers want jobs sustained. Capitalists and socialists have ‘isms’ while aristocrats, autocrats, bureaucrats and technocrats have their ‘cracies.’ All are threatened...with the term meaning something different to everyone, the quest for sustainable development is off to a cacophonous start”(19)

Before organisations can start embedding sustainability considerations into their business processes, they have to have an understanding of what it would mean to be a sustainable business. In the absence of one agreed definition for *sustainability* there have been hundreds offered (20), though none with a clear method of implementation. The most often quoted is from the Brundtland Report (21) stating sustainable development to be “development that meets the needs of the present without compromising the ability of

future generations to meet their own needs.” This definition is problematic on several levels. For instance can we define our “needs” as more than subsistence, can we know how to characterise the “needs” of future generations, can we possibly assume what their “ability” to meet these will be and how far into the “future” should we consider? In addition, Stavins et al argue (22) that sustainability is more than solely *intergenerational equity* and should encompass dynamic efficiency as well. In which case, implementing greater efficiency would provide leeway for our current generation to consume above subsistence level (which we already do with impunity) and theoretically not impinge on future generations’ access to natural resources.

International governance on sustainability has been slow and largely ineffective, leading to the conclusion that if achieving sustainability were just a matter of using existing economic tools, the challenge would not have escaped us for the last twenty-five years (23). While we may be unsure as to the maximum we can develop and still maintain resource availability for future generations, there must be some “bio-optimal scale” of development that could be defined. In theory, this model would accept that some environmental sources and sinks are irreplaceable and further economic growth will be unsustainable if reliance on raw materials is maintained (24). In terms of social sustainability, the debate becomes ever more complex. O’Connor (1995) contends that the term is quite subjective and is as much “cultural as physical” (25). At the same time, the social element should not be ignored as, Dale (2001) asserts, investment in social capital is one of the essential elements for sustainable development(26).

1.8 **At what scale should we consider sustainability?**

There are several decisions to be made in determining how sustainability issues can best be addressed. One of which would be the time-scale. For instance, if the time-scale of relevance is set to infinity then the uncertainty of ecological and economic variables become insurmountable (25). Time scale is also relevant when assessing perturbations to natural systems, which may be able to recover from damage but over a short or long period of time. This will affect the vulnerability of that natural system to additional perturbations and increase the risk of ecosystem collapse (40). In contrast, time frames for governmental and business decisions are significantly shorter, severely impacting the possibility of implementing beneficial development activities for the long term. Also, with respect to geographic scale, environmental impacts are occurring not just at the local level but also with regional and global consequences. Effectively controlling activities that are destructive at the international scale would require policy models that do not exist¹. Current policies tend to be effective at the national scale at best. How then can we grapple with this new scale of problems?

Traditionally, cost benefit analysis (CBA) has been viewed as an effective tool for assessing regulatory and management decisions. Pearce (1976) argues this tool is severely limited for assessing the risks of irreparable harm to the environment (45); primarily because values calculated for non-monetary goods and services are subjective at best and

¹ Considering the stark predictions the Stern Report has provided several years after the international community has attempted to regulate carbon emissions, we clearly have not established an adequate policy regime.

cannot be reliably compared with aggregated monetary valuations, such as GNP (1). There is considerable literature on internalizing costs of externalities, which can be accomplished through willingness to pay (WTP), willingness to accept compensation (WTA), revealed preference and stated preference analyses (46). Following his attack of CBA, Pearce et al. (1988) suggested a means of operationalising sustainability, which entailed setting minimum conditions for development to be sustainable, whereby development is a vector of desired social objectives (47). This could entail establishing a "minimax" criterion (48) where society aspires to *minimize* the *maximum* possible loss of ecosystem function through the establishment of safe minimum standards (SMS). It could be argued that establishing a set of goals for society to aspire to, like SMS, would be up to the public sector; therefore, what role could firms play in this process?

1.9 **Approaches for conceptualising sustainability**

In order to facilitate sustainable development, several novel approaches for conceptualising sustainability have been developed, critiqued and modified. An abbreviated review of these is offered as well as an attempt to find common themes between them. Critical Natural Capital is a useful tool for beginning the discussion of sustainability, as it is an effort to describe non-market goods and services with economic terms. Some of its premises have been borrowed by later methods, such as the triple bottom line. Approaches such as the Ecological Footprint are useful for conceptualizing sustainability in different units, like physical space, and could be appropriate supporting data for corporate sustainability reports.

1.9.1 **Critical Natural Capital**

The concept of critical natural capital (CNC) attempts to provide a way of describing essential stocks or flows within an ecosystem that cannot be substituted by either man-made or natural goods (25). They are generally not assigned a monetary value but are often essential to human survival (26). Ekins (2003) divides these ecosystem functions into source (So), sink (Si), life support (LS) and human health and welfare (HW) functions. Within an ecosystem several functions interact, which Ekins separates into "functions for" (beneficial to humans) and "functions of" (beneficial for natural system). One cannot ignore the value of the "functions of" as they often will support "functions for". This model of conceptualising sustainability was taken from the traditional definition of capital, which is a stock capable of generating flows of goods and services. It was designed to provide a means of thinking about the integration of a combination of non-monetary capitals into our economic system and to further facilitate this, the concept of capital is divided into four categories, namely: manufactured, human, social/organisational and natural (27) (see **Table 1** for definitions of each). (Forum for the Future).

Table 1 Definitions of capital adapted from Ekins and Forum for the Future.²

Definitions of Capital Categories

<i>Manufactured</i>	Includes machinery, tools and infrastructure that are used in our production processes.
<i>Human</i>	Includes knowledge, health and skills of people, generally enhanced through education and training.
<i>Social/Organisational</i>	Includes the institutions that provide the education and training for enhancement of human capital.
<i>Natural</i>	Includes flows and stock of natural resources and energy.

These categories of capital embrace assets that are valuable to society with or without monetary valuations. As one might therefore anticipate, trading between capitals that are not valued in the same units (i.e. money) can be quite complex. To facilitate understandings of these complex processes, attempts to substitute between these forms of capital have been used to define the four levels of sustainability that are described in **Table 2**. The levels *moderate* and *strong* have been highlighted by Ekins (1992) as the only two worth considering, though it should go without saying that a communalist approach to the economy would be a significant change from the current social order (27). The authors argue against substituting between man-made and natural capitals, particularly natural capital that could be irreversibly lost, which would favour a *strong* level of sustainability.

² http://www.forumforthefuture.org.uk/aboutus/sdtools_page398.aspx . Also visit Forum for the Future's website to read about the twelve features of a sustainable society.

Table 2 Four levels of sustainability for which society can aspire. Adapted from Gibson et al (2005), Pearce (1990) and Turner (1993) (28-30).

<i>Levels of Sustainability:</i>	Ranging from Techno-centric to Eco-centric
<i>Weak</i> (<i>Cornucopian</i>)	Full substitution between forms of capital. Objective to maximize GNP through unchecked growth and complete trust in a free market. Anthropocentric value of nature.
<i>Moderate</i> (<i>Accommodating</i>)	Modified economic growth with green accounting and reduced substitutability between capitals. Resource conservationist and consideration of intergenerational equity. A more inclusive notion of stewardship for nature.
<i>Strong</i> (<i>Communalist</i>)	Resource preservationist in a steady-state economy (zero growth), with no population growth. Focus on ecosystem health through a systems perspective and a small-scale community focus.
<i>Absolute</i> (<i>Deep Ecology</i>)	Extreme preservationist with a heavily regulated economy, minimal resource use and an intrinsic value of nature. Economy and human population greatly reduced with ethics centred on the environment.

The accounting of energy can be used as an example of the implications of this approach. Peet (1992) and Slessor (1993) contend that energy should be considered as a critical natural capital, because it can only be substituted by another form of energy (31, 32). But the finite supply of energy is not included in neo-classical valuations. While energy is currently valued and priced, thereby translating its use into the accounting calculus, the consequent loss of what might be conceived as energy capital does not enter into the present accounting system. It is therefore possible to envisage that a complementary reporting of non-monetary energy losses could provide a way in which this constraint on economic growth can be integrated in decision making (33). One possible means would be through developing an energy index or *numeraire* (31, 34, 35).

Such an energy index could be used to develop sustainability indicators, which in turn would provide some comparability between effects of different development and investment decisions. Indeed Ekins (2003) uses this model to feed into a framework (CRITINC) whereby critical environmental functions being adversely affected by human activities are highlighted and a variety of ameliorative actions are compared by measures such as: costs, consequences to stakeholders and discrepancy with sustainable consumption of the resource in question. Amongst some experts this appears to be the preferred approach for calculating our distance from attaining sustainable development, also known as the *sustainability gap* (21, 36, 37) as well as allowing us to prioritize development decisions (38). These would provide the opportunity to consider the finite availability of energy as well as enabling the irreparable loss of natural resources,

productive land and valuable biodiversity to become influential in decision-making processes (21).

1.9.2 **The Ecological Footprint**

The Ecological Footprint (EF) is a method for calculating the physical space that a population's resource consumption would occupy (40-42). More specifically, the EF of a particular population is defined as "the total area of productive land and water ecosystems required to produce the resources that the population requires, wherever on Earth that land and water may be located" (43, 44). It provides a land *numeraire* that some have claimed indicates biophysical limits to development and sustainability, especially if the calculated EF is larger than the land area occupied by the population in question. Also it has been used as an aggregate indicator of resource use patterns, with the benefit or drawback (depending on perspective) of distilling this complex problem down to a single number. This kind of calculation could be useful for evaluating a company's resource use perhaps relative to its geographic reach or number of customers.

1.9.3 **Developing a Hierarchy of Sustainability**

Many of the indicators suggested cannot be compared easily and can be vague as to what exactly is being sustained, so Marshall and Toffel (2005) suggest development of a sustainability hierarchy pyramid (see **Fig 1**), which has been divided into four levels (40). The bottom, and perhaps most essential, level includes any actions that endanger the survival of humans including damage to ecosystem service. This is followed by actions that reduce human life expectancy, actions causing species extinction and/or violating human rights and, finally, actions that are inconsistent with dominant values and beliefs. The authors were not convinced the final level was an essential element of sustainability, and concluded that literature and advocates that were too vocal on points pertaining to this level were misdirecting the debate of sustainability.

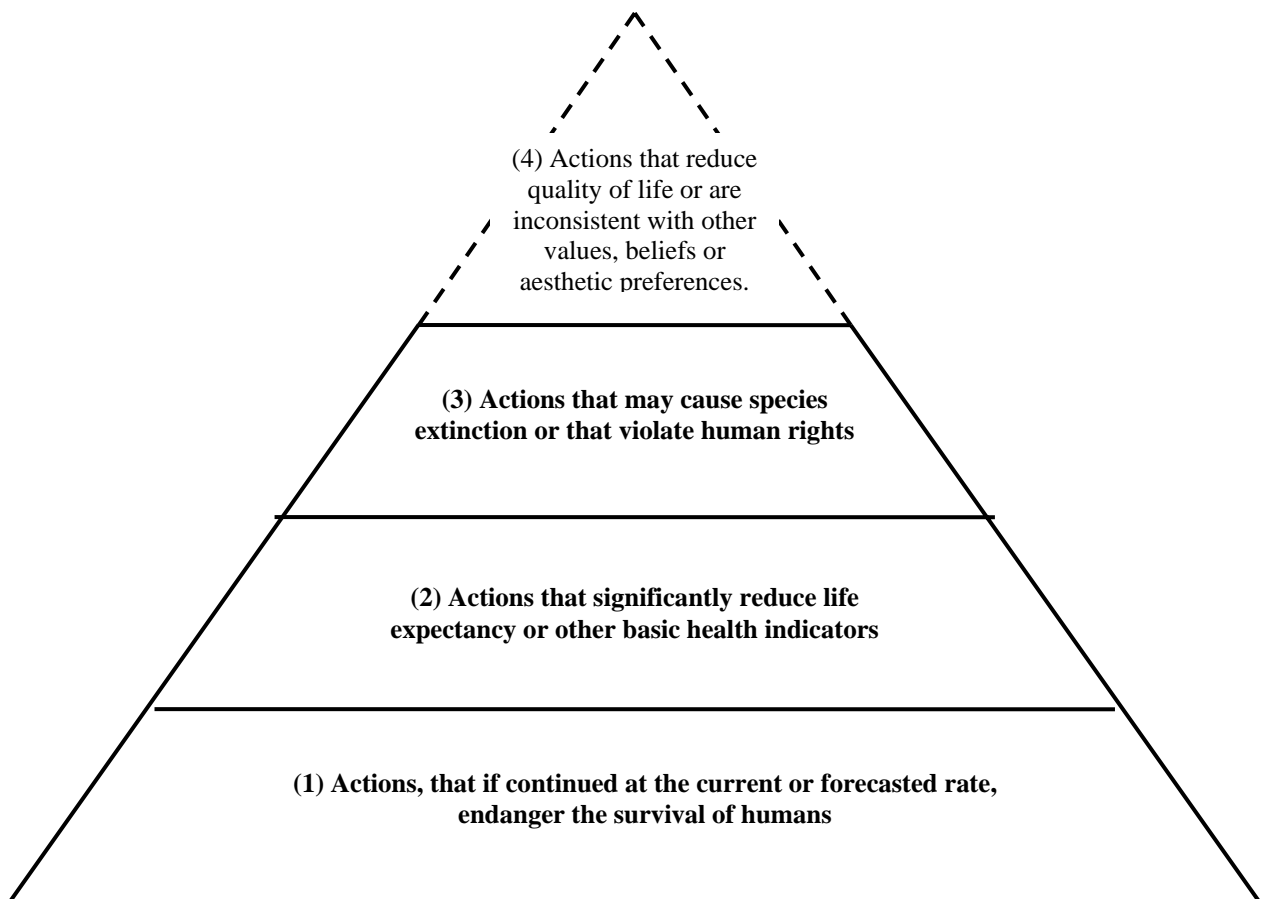


Figure 1 Sustainability Hierarchy Pyramid as developed by Marshall and Toffel (2005)(40).

1.10 Frameworks for organisational structures

Traditionally, accounting’s responsibility has been first and foremost to corporate management; however Donaldson (1982) argues that as a social construct it is implicitly accountable to a social contract (49). This would imply an ethical duty on accountants to provide transparency for society as a whole (50). Before that occurs though, there is already a great deal accounting can do for corporate management. There is a need to overcome adherence to old paradigms, too much attention to sub-unit performance instead of a system-wide view and an over-emphasis on short-term results (52).

Integrating corporate management with sustainability performance, measurement and reporting is no small task nor are there many successful examples. Also, developing appropriate indicators through consensus around what corporate sustainability means is a huge challenge. To integrate more effectively these costs into a firm’s operations they must be included with management accounts in order to influence internal decision

making (53). Evolving public perceptions and globalizing markets are applying greater pressure on business (including accounting) to report both their impacts on the natural world and their social ramifications (50). However before this occurs, improvements need to be made within reporting, namely; we need a shift from the present predominance of single dimension reporting to an approach that is more compatible with a more flexible and networked organisation that combines monetary with non-monetary information (54). What follows is a discussion of several proposed and operational methods of reporting non-monetary information about a firm’s performance.

1.10.1 Triple Bottom Line

The triple bottom line (TBL) was coined by John Elkington in 1994 and was designed to alert the business minded of the necessity to factor in non-market valuations (i.e. integrate natural capital) to their business models. The framework came on the heels of the Bhopal and Exxon Valdez disasters, the emerging deregulation of markets, ever increasing privatisation, massive corporate profits and prospering stock markets (55). For Elkington (56) there were seven areas that needed significant paradigm shifts to accomplish greater environmental and social awareness, which included markets, values, access to information (transparency), life cycle technology, partnerships (public/private, corporate/non-profit), time scale of decisions (already discussed) and corporate governance. He offers TBL, which attempts to capture the basic tenets of sustainability including social, environmental and economic concerns, as a means of instigating such paradigm shifts. In addition, the three “bottom-lines” can be combined a number of ways to produce the concepts of *eco-efficiency*, *fair trade* and *environmental justice* (40) (see Fig 2).

This discussion of TBL will focus on *eco-efficiency* as it has been used interchangeably with the term *sustainability* by business. In fact, eco-efficiency is a popular index developed by the World Business Council for Sustainable Development (WBCSD) (57), which provides a ratio of a firm’s inputs over its outputs. Seven elements of eco-efficiency have been described by Yap (2006), which include: decreasing the material intensity of goods and services, reducing energy intensity, minimising the release of toxic

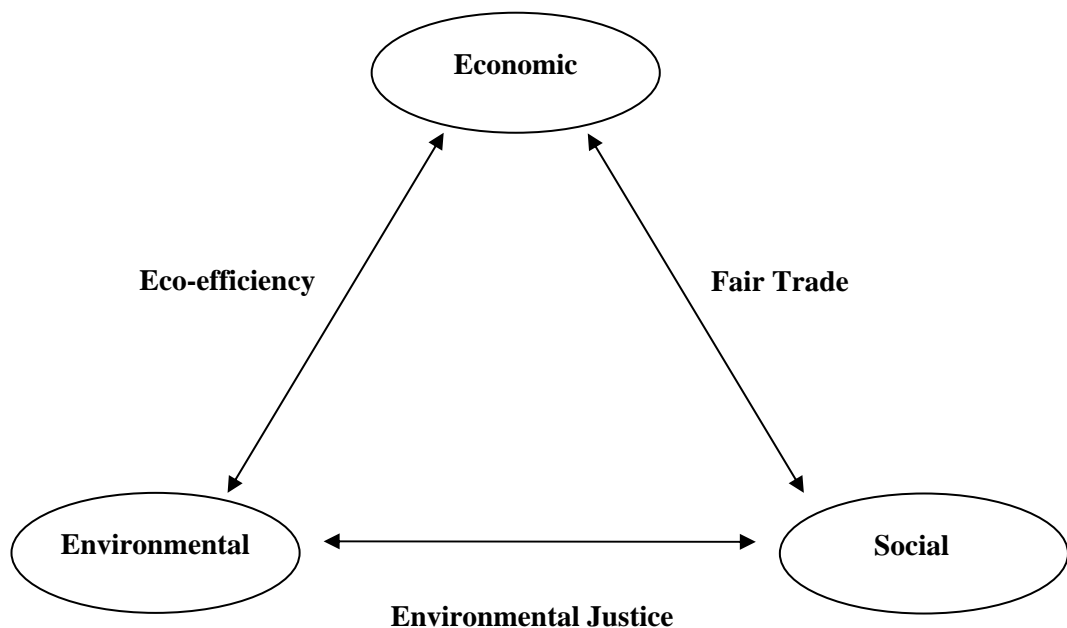


Figure 2 A visual depiction of Marshall and Toffel’s (2005) sustainability indicator combinations, derived from Elkington’s triple bottom line categories.

materials, improving the ability to recycle material, maximising the use of renewable resources, extending the life of a product and increasing the service potential of producing goods and services (58). While these are all exemplary behaviours to exhibit they are already financially advantageous for a company. Nor would they necessarily guarantee a decrease in the absolute amount of resources because the management of eco-efficiency focuses on the ratio of inputs to outputs rather than the absolute amount. Therefore, the use of eco-efficiency analysis in conjunction with other sustainability reporting methods would be preferable. Other critiques of TBL highlight its allowance of trade-offs between costs (or critical natural capitals) instead of emphasising what is likely to be an increased need for minimum absolute standards of environmental performance on certain key dimensions of sustainability (60). Finally, are environmental, social and economic indicators enough to capture sustainability measurements (61)?

1.10.2 **The Balanced Scorecard**

Kaplan and Norton introduced the Balanced Scorecard in the 1990s because of a reaction against business' strict reliance on financial data for measuring success (62). They argued that financial measures were more "lag indicators" demonstrating the result of past actions. The BSC is a move away from the "linear, additive model" of traditional accounts to the use of *strategy maps* divided into four perspectives (financial, customer, internal and organizational), which are broken down further into goals, indicators, targets and tasks. It is a top-down approach whereby management sets the firm's strategic objectives (see Porter 1996 (63)). These include various differentiating strategies such as, operational excellence, customer intimacy and product leadership. Other types include stakeholder and key performance indicator (KPI) scorecards. While these may be useful tools for evaluating corporate governance, they lack the drivers to accomplish strategic goals and the connection between customer relations and internal performance. See Kaplan and Norton (2001) for further discussion (62).

1.10.3 **The Sustainability Balanced Scorecard**

A modification of the Balanced Scorecard is the Sustainability Balanced Scorecard, which is a framework for improved environmental reporting developed by Moller and Schaltegger (64). While adopting the use of Kaplan and Norton's *strategy maps* they suggest the inclusion of a non-market perspective (such as the environmental or social impacts of a firm's operations) in order to influence management's decision-making. It was developed in reaction to environmental accounting's tendency to create "satellite accounts" that were often not presented to a firm's management (53). Establishing these separate entities seemed counterproductive in light of the major tenet of sustainability being greater *integration* (65). As a result, Schaltegger and Wagner developed this "integrated" framework consisting of the Balanced Scorecard (with non-market perspectives), sustainability accounting and sustainability reporting. In their view, sustainability accounting is the important link between BSC and reporting, while eco-efficiency analysis is a useful link between BSC and sustainability accounting. The literature on this model also calls for the standardisation of accounting and performance measurement through sector-specific and coordinated agreement of sustainability indicators.

1.10.4 **Tableau de Bord**

Since 1932, French firms have been operating under the managerial concept *tableau de bord* or dashboard (66) and have generally rejected the “mechanical and top-down” approach of the Balance Scorecard (67). Bourguignon et al (2004) argue this is due to implicit ideological differences between France and the United States (11), and even perhaps among other countries in continental Europe that have adopted the BSC to some extent (68). Tableau de bord is a reporting tool for the top management of a firm, which is organized into several subunits, providing a global view of its operations and environmental performance. It is not as prescriptive a system as BSC so can be more dependent on a manager’s bias (11). Its primary reporting units are from causal performance indicators described as OVAR (*Objectifs-Variables d’Action-Responsables*) (69). Like the BSC, tableau de bord can be cascaded down through an organisation in order to align each sub-unit’s strategic goals. This model is not designed to consider sustainable indicators necessarily, but offers a robust process by which they could be integrated in a corporation’s strategic planning.

1.10.5 **The Sustainability Assessment Model (SAM)**

The Sustainability Assessment Model (SAM) is also a top-down approach that uses the concept of full-cost accounting (FCA). FCA is a method of identifying all internal and external costs of a project and translating them into monetary values. There are clearly delineated steps for FCA, which include defining the scope for the analysis, attempting to identify and measure external impacts and finding a cost for all impacts. SAM is a means of measuring the sustainability impacts over a project’s full life cycle, from resource extraction through the production process to final consumption. These impacts include the direct environmental and social impacts as well as broader social costs and benefits. The limitations of this model are due to a lack of an operational definition for sustainability, its allowance of substitutability between several forms of capital rather than recognising that increasingly there may be a need for absolute standards of performance in some key areas of sustainability, and the extent to which an organisation can be held responsible for social and environmental impacts (70). It is a means for generating a corporation’s unique sustainability “signature,” which includes a measurement of costs and benefits for social, environmental, economic and resource effects. This signature can be further distilled to produce a percent distance from sustainability, termed an index of sustainability (or SAMi).

1.11 **Are any of these frameworks being used?**

As discussed above, French firms have adopted the system of Tableau de Bord, however due to its dependence on managers’ priorities, it does not require adherence to a set of sustainability principles. The same criticism can be made of the Balanced Scorecard, which does not include non-market variables. There are several practical barriers for implementing sustainability accounting and reporting. For instance, value-added statements (as recommended by the Global Reporting Initiative) describe financial flows of an individual organisation while not including costs on third party stakeholders. Assigning monetary values to non-market goods, like social impacts, is difficult and controversial. In addition, once impacts are given a monetary value it may be too easy to trade off between them, such as carbon emissions and water pollution (60) and it is

difficult to define clearly where an organisation's responsibility ends. To be effective, all firms need to be reporting on their sustainability performance; however the process of reporting remains voluntary. Without external regulation it is not reasonable to expect a corporation to behave responsibly in conflict with its financial imperatives (59). Consequently, firms will only act in 'zones of discretion' where social and environmental actions will have financial benefits (71).

Environmental accounting literature has undergone massive growth over the past ten years and has documented accountants' lack of innovation in valuation and reporting methods. This has been attributed to the reticence of accounting educators to teach alternative techniques as well as the predictable influence of business' expectations on the profession. In a review of the academic literature, Gray and Bebbington (2000) found the incidence of environmental disclosure to be increasing, though mainly amongst the larger companies and variably across countries and industries (72-75). Also, the term "sustainability" has been absorbed into business parlance without a proper definition, often used as a synonym for eco-efficiency. This has created the situation where business can give the false impression it has the intention of adopting environmentally and socially favourable activities above and beyond their financial benefit (76-78). At the same time, the more general process of increasing public performance reporting appears to be creating the impetus for improved corporate accountability. But increased external scrutiny is not an outcome most corporate management teams would welcome, so there remains a systemic reluctance to increase externality accounting.

1.12 **Accountability**

Several frameworks of public disclosure and accountability have been developed to produce corporate "standalone" reports. These include, though are not limited to: the Global Reporting Initiative (GRI), the Carbon Disclosure Project (CDP) and the Dow Jones Sustainability Index (DJSI). The DJSI, established in 2002, is an excellent example of businesses claiming adherence to sustainability principles with an over-emphasis on economic factors. For instance, the DJSI defines corporate responsibility as "a business approach that creates long-term shareholder value by embracing opportunities and managing risks deriving from economic, environmental and social developments"(79). This definition does not appear to induce firms to aspire for sustainability goals above and beyond their financial interests (38). Such data is also heavily dependent on what firms wish to disclose through annual questionnaires, third party documents and personal communications.

The GRI is considered the dominant provider of "best practice" for sustainability reporting. It was begun in 1997 under the auspices of CERES. It gained international recognition in 1999 when the United Nations Environment Program (UNEP) partnered with the GRI. By 2001 the GRI had released its second iteration of guidelines for sustainability reporting. Critics of these guidelines have noted their heavy dependence on TBL indicators. As discussed earlier, TBL indicators are approximations of sustainability principles without consideration being given to society-wide development targets. Therefore a corporation's adherence to the GRI principles of reporting again should not be mistaken as the same as achieving sustainability (80). Perhaps in response to this pressure, the GRI released its G3 Indicator Protocols in 2006 with these including

indicators on economic sustainability, environment, human rights, labour, product responsibility and society. According to GRI, this last iteration is a departure from its earlier emphasis on the use of performance indicators to assess sustainability with the protocol in each area now providing guidance on reporting principles, procedures and available management approaches

Fundamentally, there is no standardised form of standalone (e.g. environmental or sustainability) report; therefore there are at least an equal number of methods for evaluating social and environmental impacts as there are reporting measures. Taking the UK as an example, the UK ACCA is aware of eight different categories of standalone reports for addressing social and environmental reporting. For example, the titles used by one accounting firm for standalone reports have changed from “environmental reporting” to “sustainability reporting” to “corporate responsibility reporting”; thereby confusing what exactly is intended to be disclosed through these reports. Nevertheless, it was found that 52 percent of the Global Fortune 250 produced a voluntary standalone report in 2004, an increase of seven percent from 2002 (81). Yet when the information in these reports is compared to the criteria of sustainability reporting as developed by SustainAbility/UNEP, the “best” 2004 report, prepared by Cooperative Financial Services, only received a score of 71 percent (80).

Clearly there is a serious discrepancy between the need for adequate reporting and the data being made available to the public. This has led, Gray (*forthcoming*) to conclude that *no* companies are actually reporting on sustainability (80). Referring back to the discussion of how to define sustainability, this conclusion is not a surprise. What is surprising, however, is the number of companies *claiming* to be producing reports capturing the principles of sustainability. This begs the question, why are corporations investing in greater sustainability reporting if they are not fully in a position to achieve it in their operations? The drivers of this growing trend are not yet clear. Some of the reasons suggested include: competition, risk management, innovation, emerging markets, value of reputation and increasing incidence of mandatory reporting (80). Most likely the trend is due to a combination of all of these.

1.12 The role of accountants in the drive to sustainability

The Institute of Chartered Accountants in England and Wales (82) produced a report titled *Sustainability: the role of accountants* in October 2004. The aims of the report was to raise awareness of sustainability issues, demonstrate how professional accountants can be more engaged and augment public debate about sustainability. It presents a market-based approach to achieving sustainability (see **Figure 3**). Within this approach, ICAEW outlines the role of accountants in each of the eight mechanisms through which sustainability goals can be enhanced; most of which involve accountants' provision of the necessary information generated through detailed monitoring of production processes, evaluating corporate performance and communicating feedback through greater stakeholder engagement. This information can then be utilised to propose useful benchmarks to decision makers as well as implement working knowledge of existing regulation and tradable permit schemes to prepare business for a changing economic regime.

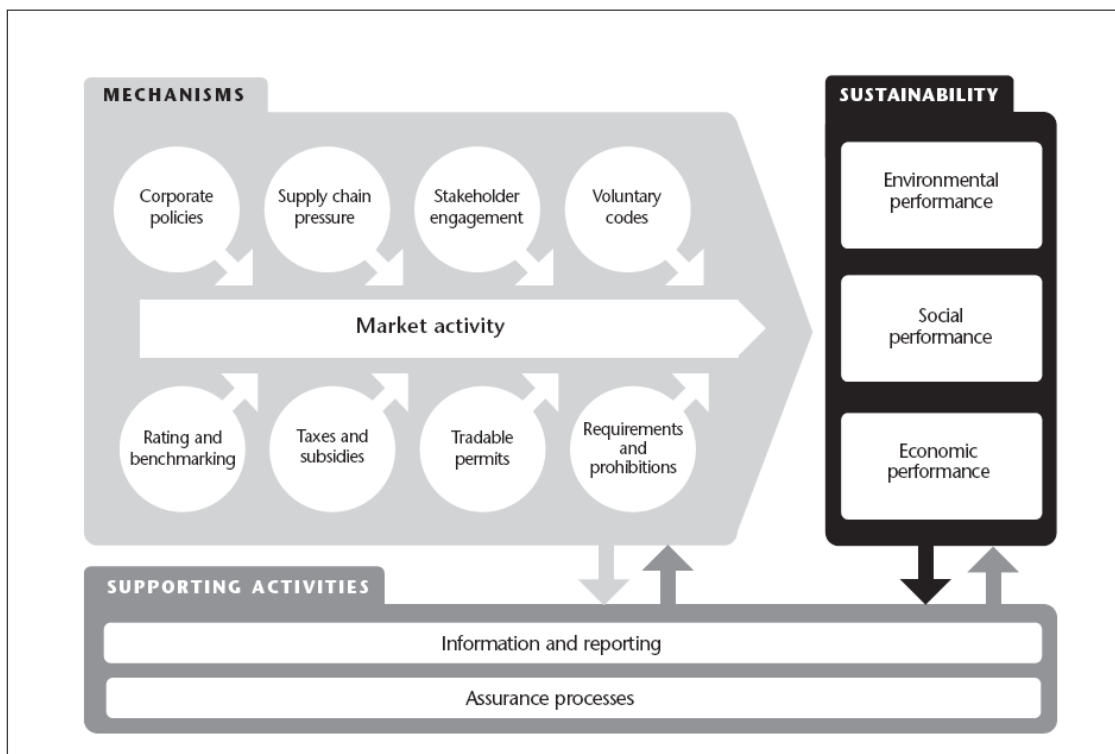


Figure 3 Diagram of eight market-based mechanisms that could be adopted to achieve development closer to sustainability. Taken from ICAEW (2004)

This framework, as outlined by ICAEW, appears to be more of a business wide approach to sustainability, whereby efforts are coordinated across sectors perhaps in a national context with direct Government regulation of the market concerned. The previous frameworks described were meant to be implemented at the organisational level. Either

way, several experts cite have called for an international standardisation of sustainability reporting. Leadership by an organisation like ICAEW or ACCA has the potential for a significant effect on professional accounting and by extension business reporting. Yet would changing business reporting be enough to achieve our goal of sustainable development? Gray and Milne (2004) offer that “while we may, eventually, be able to account at the organizational level for elements of *unsustainability* and for contributions to/detractions from social justice, a full account of sustainability may simply make no sense at an organisational level” (59).

Perhaps accounting for sustainability at the organisational level will have a limited impact on society’s overall performance if done sporadically, because these efforts need to be occurring simultaneously among a diversity of players including national and international governmental bodies (83). At the same time, environmental accounting and full cost accounting have been lauded as steps in a positive direction (5), especially if they push us individually or collectively to attain dynamic efficiency (22). As has been asserted over and over again, accounting is a means of providing *visibility* to the impacts of our activities so that management decisions affecting the future can be made. It has been said that by the time information has reached accountants it is generally already too late to address the problem. Therefore accounting in and of itself is not the solution to addressing our *sustainability gap*, but as Gray states can provide us with the information to calculate our level of *unsustainability* or in some cases bring about a paradigm shift concerning development.

Instead of relying on the TBL approach to provide a final/bottom-line measurement, it would also be sensible to integrate greater consideration of sustainability indicators earlier in the decision process. McDonough and Braungart (2002) suppose a “triple top line” model (84). This would be a tool for refocusing “product development from a process aimed at limiting end of pipe liabilities” to facilitating designing safer and less destructive products initially ((84) p1). This model lends itself well to the concept and now emerging field of Industrial Ecology, which harkens to Boulding’s (1966) view that a sustainable economy is one that can function like a cyclical ecological system(85). Like an ecosystem, industrial production could be coordinated so that wastes from one process could be inputs for complementary processes; whereby outputs from each process are generated at a rate consistent with demand (a.k.a. industrial symbiosis) (86). The idea of Industrial Ecology is to challenge the notion that man and nature are separate and instead that ecology could provide inspiration for industrial design (4). This model would encourage the development of chains, clusters and networks, which already are viewed as stable models in the business realm (18).

1.13 Conclusion

The key points to draw from this section are: society as a whole is still struggling to define sustainability adequately (e.g. time scale, spatial scale, etc.); however, due to a variety of drivers corporations are practising increased “sustainability reporting”, although there is not as yet an existing reporting model that reliably measures distance to sustainability and accountants will be expected to provide greater amounts of information not previously captured in management reports. The literature on accounting for sustainability is on the one hand quite varied as to possible methods of reporting and on

the other agreed that sustainability indicators need to be integrated into decision-making more effectively. Currently, corporations are being lauded for producing “standalone” reports on their social and environmental performance often based on the relatively limited TBL (including DJSI and GRI); however these have not been shown to influence corporate management decisions. The discussion of existing and proposed management strategy tools, such as BSC, SBSC and Tableau de Bord, provides for approaches capable of greater integration of sustainability principles. Further, the role of accountants in this process is to increase transparency of business activities, particularly in the realm of social and environmental impacts. This may only be accomplished through mandatory reporting requirements, as voluntary measures have seen relatively limited participation to date.

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