



26th IPMA World Congress

Sustainability in the Business Case

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Abstract

This paper explores the integration of indicators that reflect the concepts of sustainability into business cases and business case evaluation methods. It is based on the observations that sustainability is one of the most important challenges of our time and that sustainable development requires change of the way we use resources, produce products, share our wealth, and so on. And as change is inescapably related to innovation and projects, sustainable development is related to projects. Business cases of projects should therefore reflect this relationship and include criteria for the assessment of sustainability aspects.

Based on an identification of business case evaluation methods, and an overview of frameworks for sustainability indicators, an analysis is made of the inclusion of the indicators and principles of sustainability in business cases and business case evaluation methods.

The analysis will conclude that the integration sustainability considerations into business cases of projects, is more than a set of additional criteria to be considered. Integration of sustainability considerations suggests a more holistic and elaborated perspective on business case evaluation than the Return on Investment question, that is dominating business cases and business case evaluation today.

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Keywords: Project Management; Sustainability; Information Technology; Information Systems; Business Case

1. Introduction

Sustainability is recognized by the United Nations as one of the most important challenges of our time (Glenn and Gordon, 1998). How can we develop prosperity without compromising the life of future generations? The pressure on companies to broaden its reporting and accountability from economic performance for shareholders, to sustainability performance for all stakeholders has increased

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substantially (Visser, 2002). Proactively or reactively, companies are looking for ways to integrate ideas of sustainability in their marketing, corporate communications, annual reports and in their actions (Hedstrom et al., 1998; Holliday, 2001).

The concerns about sustainability indicate that the current way of producing, organizing, consuming, living, etc. have or may have negative effects on the future. In fact, the World Commission on Environment and Development (1987) stated that current business practices are not sustainable and that these these practices need to change. A frequently used way of realizing change in organizations is by creating temporary, result oriented organizations: projects (Lundin and Söderholm, 1995; Turner and Müller, 2003). A growing number of authors, Silvius (2012) reports over 85 publications and studies on the topic, therefore link the concepts of sustainability to projects and project management.

The nature of these studies is mostly interpretive, giving meaning to how the concepts of sustainability *could* be interpreted in the context of projects (for example Barnard et al, 2011; Maltzman and Shirley, 2010; Gareis et al., 2011, Oehlmann, 2011). Some publications add a normative angle, prescribing how sustainability *should* be integrated into projects (for example, Silvius et al., 2012; Labuschagne and Brent, 2006). An important source for the normative angle, is the vast ‘body of knowledge’ on sustainability and sustainable development. However, many definitions of and publications on sustainability provide concepts and principles that are not easily operationalized in practice.

Silvius et al. (2012) conclude that the consideration of sustainability principles in projects and project management implies that “The business case of the project may need to be expanded to include also non-financial factors that refer to for example social or environmental aspects.” This paper builds on that view by exploring the integration of indicators that reflect the concepts of sustainability into business case evaluation methods. The paper will present a brief overview if evaluation methods, and an exploration of frameworks for sustainability reporting and evaluation. The paper will then analyze how these two concepts, business case evaluation and sustainability, fit, and make a number of observations on the similarities and differences of the concepts.

2. Business case evaluation methods

The business case of a project and its evaluation is based on the economic concepts of investment justification and selection. Silvius (2008) provides an overview of business case evaluation and justification methods, based on the classification of methods provided by Renkema and Berghout (1996). In this overview, the evaluation methods are grouped into four categories: Financial methods, Multi-criteria methods, Ratio methods and Portfolio methods.

2.1. Financial methods

Financial methods consider the valuation of a project investments purely as an economic issue. As long as the effects of the investment are understood, calculating the value of it is merely a financial technicality (Silvius, 2010). However, in reality capturing the value of something (a new asset, a revised process, a changed product) is not quite that straightforward. Financial valuation methods all have assumptions and limitations, that unfortunately are not always well understood. Table 1 provides an overview of these valuation methods.

<i>Valuation method</i>	<i>Qualities</i>	<i>Limitations</i>
Return on investment	Easy to calculate Easy to interpret In line with the financial administration	Outcome sensitive to amortization method Ignores the time-value of money Ignores risk

Pay-back period	Quite easy Intuitively coping with risk	Ignores part of the revenues Simplistic, does not determine value
Internal Rate of Return	Includes the time-value of money Easy to interpret Based on cash-flows	Complex Not in line with the financial administration Ignores risk Multiple outcomes, or none, possible
Discounted Cash Flow / Net Present Value	Includes the time-value of money Based on cash-flows Copes with risk	Complex Complex to interpret Not in line with the financial administration Not conclusive in case of projects with different durations
Economic Value Added	Includes the opportunity value of money In line with 'shareholder value'	Value calculation based upon one of the other methods Not in line with the financial administration
Real Options Valuation	Includes optimality and managerial flexibility in investments	Complex Complex to interpret Data often not available Not in line with the financial administration
Game theory	Includes market developments Adds a strategic perspective	Data often not available Not in line with the financial administration

Table 1. Overview of Financial valuation methods (based on Silvius, 2010).

The limitations of these financial methods to capture the more qualitative aspects of value and impact led to the development of other methods.

2.2. Multi-criteria methods

Multi-criteria methods are a reaction to the problems of capturing the full value of investments in just financial metrics. These methods aim to identify different relevant aspects of value and risk in order to enable a thorough discussion and an informed discussion (Frisk, 2007). The challenge of capturing the 'real' value of investments and projects was fuelled by the notorious debate about the value of information technology (IT) and IT investments (Silvius, 2010), the infamous 'IT productivity paradox' (Brynjolfsson, 1993). Probably the best known statement about this paradox was done by Robert Solow when he stated: 'You can see the computer age everywhere but in the productivity statistics' (Watherbe et al., 2007). It is probably for this reason, that the most influential method using multiple criteria, the Information Economics method (Parker et al., 1988), was developed to evaluate IT projects. However, since its publication, the basic methodology of the method has also been applied to evaluate projects in other domains.

Information Economics is suited for evaluating a single project as well as a portfolio of projects. It identifies evaluation criteria that express (potential) positive contributions (benefits, for example Return on Investment, Strategic Match, Competitive Advantage, Management Information, Competitive Response) and criteria that express potential negative effects (risks, for example Organisational Risk, Definitional Uncertainty, Technical Uncertainty) of a project. The importance or 'weight' of the different criteria may not be equal. Management therefore has to decide upon a weight factor for each criteria. Based upon the set of criteria and weight factors each project or investment is given a score on all of the

criteria. It is crucially important that the scores are underpinned in this more objective way in order to create acceptance for the results of the evaluation process.

The results of the evaluation process can be presented in a graphically attractive way. The scores on the positive criteria totalled to a score representing the ‘value’ of the investment. The scores on the negative criteria add up to a total ‘risk’ score. Combining the two scores in a two-dimensional graph provides management with a concise overview of the investment portfolio.

2.3. Ratio methods

Different from the financial and multi-criteria methods are ratio methods not aimed at evaluating a specific investment or project, but at finding the ‘right’ level of investment for an organization. This level is expressed as a ratio, e.g. Marketing costs / total revenue or IT costs / employee. The outcome of these ratios should be considered relative to the same ratios at competitors or for one organization in time. Lower or higher scores on these ratios than comparable organizations are not per-se right or wrong, but should give reason for investigation and discussion. A limitation to the applicability of the ratio methods, however, is the availability of data required for the ratios.

2.4. Portfolio methods

In 1981 F. Warren McFarlan suggested to analyze and manage investments and projects in terms of revenues and risks using portfolio theory, as was done in the financial world (Warren McFarlan, 1981). ‘Portfolio theory’ referred to the ‘modern portfolio theory’ as developed by Markowitz (1952). Although appealing, the use of this insight did not really take off until the Clinger-Cohen Act. This Act states that the management of IT in US government institutions “*must reflect a Portfolio Management approach and decisions to terminate or make additional investments are based on performance much like an investment broker is measured and rewarded based on managing risk and achieving results*”. With its reference to portfolio theory, the Clinger-Cohen Act aimed to bring transparency to project investments and benefits. Since then, project portfolio management has developed into a discipline and a practice in many organizations.

When applying portfolio theory to projects, however, some issues may occur. These issues relate to the differences between investments in financial assets, the domain of Markowitz’ theory, and investments in projects that cover a variety of assets and organizational changes. Important differences are: the scalability of the investments, the tradability of the investments, the unique character of some investments, the exchangeability of benefits, and the unfamiliarity of project risks (Van Rossum and Silvius, 2006). These differences basically imply that modern portfolio theory cannot be literally applied to (a portfolio of) ‘real’ projects. However, on a more reflective level, some useful insights could be derived (Van Rossum and Silvius, 2006).

An important insight in portfolio theory is the understanding that the value of a project will be influenced by other projects in the portfolio. In other words, business cases of projects do not exist in isolation. Whereas all other evaluation methods aim to capture the value of an investment as an autonomous value, portfolio methods study value of investments in relation to other investments.

Portfolio theory also points out the importance of having a structured process in place for the continuous evaluation of the total portfolio of investments and projects.

3. Sustainability indicators

Crucial for developing more sustainable business practices is the ability to evaluate the sustainability aspects of different policies and projects, as well as to monitor progress. Or, as Jain (2005) argues: "The

ability to analyze different alternatives or to assess progress towards sustainability will then depend on establishing measurable entities or metrics used for sustainability". The most frequently used instruments in this context are frameworks or sets of sustainable development indicators (SDIs), both as a way of measuring and evaluating (proposed) actions, and as a way of communicating this information (Bell and Morse, 2003).

Many organizations have developed frameworks of indicators for this goal. In fact, the literature on these models is a veritable jungle of different approaches and numerous case studies (Olsson et al, 2004). The International Institute for Sustainable Development (IISD) maintains an online directory of SDI initiatives. This directory includes more than 600 initiatives at national and international levels by governments, non-governmental organizations (NGOs) and individuals. It can therefore be concluded that the use of SDI as an evaluative tool is still very much in its infancy (MacGillivray, 1995, Bell and Morse, 2003) resulting in more questions than answers. What should be measured and what could be excluded? What are the most effective indicators? How should they be organised? And how can the indicators be communicated? The following section gives an overview of some of the most influential frameworks for SDIs.

3.1. Natural Step Framework

One of the first initiatives to bring scientific principles to the assessment of sustainability was by Swedish scientist Karl-Henrik Robèrt. Robèrt coordinated a consensus process to define and operationalize sustainability. At the core of the process lies a consensus on what is called 'the Natural Step framework'. The Natural Step Framework is a holistic framework which helps organizations to integrate sustainability principles into their business strategies. It provides a tool for developing a shared vision, shared identity and shared goals among departments and along supply chains. Foundation of the Natural Step Framework is the principle that a company should try to reduce its negative impacts on the biosphere while enabling humans to fulfil their needs. It stimulates companies to re-think production processes and product design and to find innovative alternatives for achieving their business goals. The framework provides a good basis for both awareness raising as well as strategy development.

3.2. IISD Dashboard of Sustainability

The IISD is a Canadian-based, public policy research institute, dedicated to advancing sustainable development. The IISD developed a sustainability 'dashboard' that "illustrates the complex relationships among economic, social and environmental issues" (International Institute for Sustainable Development, 2012). This Dashboard of Sustainability is intended for decision-makers and others interested in sustainable development. It is based on the Millennium Development Goals indicators for developing countries. These indicators help define Poverty Reduction Strategies and monitor the achievement of the Millennium Development Goals.

3.3. WBCSD Measuring Impact Framework

The World Business Council for Sustainable Development (WBCSD) is an organization of companies that joined forces in order to create a sustainable future for business, society and the environment. The WBCSD argues that "sustainable development is good for business and business is good for sustainable development". This view is supported by some economists that state that, contrary to the popular belief that sustainability requires a trade-off of economical and environmental/social benefits, it is possible for the concepts of sustainable development and competitiveness to merge if enacted wisely (Esty and Porter, 1998).

The WBCSD developed a framework, the Measuring Impact Framework, to assess the contribution of business to the economic and broader development goals in the societies where business operates. It is designed to help companies understand their contribution to society and use this understanding to inform their operational and long-term investment decisions, and have better-informed conversations with stakeholders. The Measuring Impact Framework includes a 4-step methodology to help companies in any industry operating in any part of the world to measure, assess and manage their impacts on society. In the application of the methodology, an organization should adapt it to the specific company strategy and development context in which the business operates;

3.4. UN Global Compact framework

The United Nations (UN) Global Compact (2010) is a framework of ten universally accepted principles, developed by the UN and a number of large corporations. It covers the areas of human rights, labour, environment and anti-corruption. Participating companies agree to comply with these principles. They can use the framework as a platform for disclosure. This initiative has been created because the UN realized that businesses are primary drivers for globalization and can help ensure long-term value creation that can bring benefit to economies and societies all over the globe. In the absence of global regulations, this voluntary code of conduct has been developed, hoping to stimulate companies to more sustainable business practices.

3.5. UNCSO Indicators of Sustainable Development

Following the 1992 Rio Earth Summit, the UN Commission on Sustainable Development (UNCSO) started the development of the 'Indicators of Sustainable Development'. This resulted in a set of 134 indicators of sustainable development. Country case studies and further discussion in the UNCSO led to the rejection of a framework in lieu of "themes" and a more comprehensive set of 'core' indicators.

The third, revised set of the UNCSO indicators was finalized in 2006 by a group of experts from developing and developed countries and international organizations. This third edition of the indicator set is based on the previous two (1996 and 2001) editions, which have been developed, improved and extensively tested. It contains 96 indicators, including a subset of 50 core indicators. The guidelines on indicators and their detailed methodology sheets are available as a reference for all countries to develop national indicators of sustainable development.

3.6. ISO 26000 Core subjects and Issues

As a response to businesses' growing interest and the increasing number of sustainability-related institutions and frameworks, the International Organization for Standardization (ISO) launched ISO 26000, a comprehensive guideline on social responsibility, to help companies introduce more sustainable practices. ISO 26000 is a guideline on social responsibility that is designed for all types of organizations. ISO 26000 summarizes seven social responsibility 'core subjects': Organizational governance, Human rights, Labour practices, The environment, Fair operating practices, Consumer issues and Community involvement and development. These core subjects are further broken down into 'issues', specific themes or activities a company should work on in order to contribute to sustainable development.

3.7. GRI Sustainability Reporting Guidelines

The Global Reporting Initiative (GRI) is a non-profit organization that pioneered the world's most widely used sustainability reporting framework, the Sustainability Reporting Guidelines (SRG). Companies can use the SRG to indicate to shareholders and consumers their economic, social and

environmental performance. GRI’s objective is to facilitate sustainability reporting for companies and thereby stimulate them to operate more sustainably. The SRG framework consists of an extensive set of indicators, from which companies can select a set that is relevant to their operations or industry.

3.8. Dow Jones Sustainability Indexes

The Dow Jones Sustainability Indexes (DJSI) are not a reporting tool, but a family of indexes evaluating the sustainability performance of the largest 2,500 companies listed on the Dow Jones. They are the longest-running global sustainability benchmarks worldwide. The DJSI is based on an analysis of corporate economic, environmental and social performance, assessing issues such as corporate governance, risk management, branding, climate change mitigation, supply chain standards and labor practices. It includes general as well as industry specific sustainability criteria.

From this overview of SDI frameworks it should be concluded that, although many organizations have offered meaningful lists of indicators, consensus on how to measure and assess sustainability has not emerged yet. A recurring structure in many frameworks is the Triple-P concept mentioned in section 3. However, some frameworks, for example ISO 26000, adopt a completely different structure and also different perspectives. Many specialists actually question whether or not a common list is even possible, given the wide variety of conditions and the differences in values in different contexts.

In the so called Bellagio principles (Table 2, Hardi and Zdan, 1997), a set of overarching principles for the assessment of sustainability are formulated, thereby suggesting that a truly ‘universal’ framework to measure sustainability may be illusive.

<i>Bellagio principle</i>	<i>Description</i>
	Assessment of progress toward sustainable development should:
Guiding Vision and Goals	<ul style="list-style-type: none"> • Be guided by a clear vision of sustainable development and goals that define that vision.
Holistic Perspective	<ul style="list-style-type: none"> • Include review of the whole system as well as its parts. • Consider the well-being of social, ecological, and economic sub-systems, their state as well as the direction and rate of change of that state, of their component parts, and the interaction between parts. • Consider both positive and negative consequences of human activity, in a way that reflects the costs and benefits for human and ecological systems, in monetary and non-monetary terms.
Essential Elements	<ul style="list-style-type: none"> • Consider equity and disparity within the current population and between present and future generations, dealing with such concerns as resource use, over-consumption and poverty, human rights, and access to services, as appropriate. • Consider the ecological conditions on which life depends. • Consider economic development and other, non-market activities that contribute to human/social well-being.
Adequate Scope	<ul style="list-style-type: none"> • Adopt a time horizon long enough to capture both human and ecosystem time scales thus responding to needs of future generations as well as those current to short term decision-making. • Define the space of study large enough to include not only local but also long distance impacts on people and ecosystems. • Build on historic and current conditions to anticipate future conditions.

Practical Focus	<ul style="list-style-type: none"> • An explicit set of categories or an organizing framework that links vision and goals to indicators and assessment criteria. • A limited number of key issues for analysis. • A limited number of indicators or indicator combinations to provide a clearer signal of progress. • Standardizing measurement wherever possible to permit comparison. • Comparing indicator values to targets, reference values, ranges, thresholds, or direction of trends, as appropriate.
Openness	<ul style="list-style-type: none"> • Make the methods and data that are used accessible to all. • Make explicit all judgments, assumptions, and uncertainties in data and interpretations.
Effective Communication	<ul style="list-style-type: none"> • Be designed to address the needs of the audience and set of users. • Draw from indicators and other tools that are stimulating and serve to engage decision-makers. • Aim, from the outset, for simplicity in structure and use of clear and plain language.
Broad Participation	<ul style="list-style-type: none"> • Obtain broad representation of key grass-roots, professional, technical and social groups, including youth, women, and indigenous people - to ensure recognition of diverse and changing values. • Ensure the participation of decision-makers to secure a firm link to adopted policies and resulting action.
Ongoing Assessment	<ul style="list-style-type: none"> • Develop a capacity for repeated measurement to determine trends. • Be iterative, adaptive, and responsive to change and uncertainty because systems are complex and change frequently. • Adjust goals, frameworks, and indicators as new insights are gained. • Promote development of collective learning and feedback to decision-making.
Institutional Capacity	<ul style="list-style-type: none"> • Clearly assigning responsibility and providing ongoing support in the decision-making process. • Providing institutional capacity for data collection, maintenance, and documentation. • Supporting development of local assessment capacity.

Table 2. Overview of the Ballagio principles (Hardi and Zdan, 1997).

These principles provide guidance in the analysis of the impact of integrating sustainability indicators in business cases and business case evaluation, as reported in the next section.

4. Analysis

When confronting the methods of business case evaluation identified in section 2 with the overarching Ballagio principles derived from frameworks of sustainability indicators, a number of observations can be made.

4.1. Integrating sustainability indicators suggests a multi-criteria approach

The principles Holistic Perspective and Essential Elements, prescribe for sustainability evaluation the use of more perspectives than just the economic perspective. Most frameworks of sustainability indicators adopt the triple-P concept and some frameworks take an even more holistic view. This suggests that by

definition a business case evaluation approach based solely on the economic perspective is inadequate for capturing the sustainability aspects of projects.

From the four groups of methods identified by Renkema and Berghout, the multi-criteria group of methods seems most appropriate to include the multiple perspectives that the concepts of sustainability imply.

4.2. Inclusion of sustainability indicators makes sense

Multi-criteria methods for business case evaluation, like Information Economics, typically include an indicator for the contribution of the project to the strategy of the organization. The business case of a project therefore logically links to strategy. And as more and more companies are integrating statements about sustainability in their strategy (Hedstrom et al., 1998; Holliday, 2001), inclusion of sustainability indicators in business cases and business case evaluation makes sense. In the Bellagio perspectives this link is captured in the principle Guiding Vision and Goals, that prescribes that assessment of sustainability aspects should be guided by a clear vision of sustainable development and goals that define that vision.

4.3. A universal method for evaluating projects and business cases is illusive

The recognition in the Bellagio principles that a sensible and meaningful set of sustainability indicators is context specific, and that consensus should be sought on the level of principles rather than specific indicators, suggests that a 'one size fits all' approach to business case evaluation may not be viable. This is also recognized by principle Practical Focus that stated that standardizing of measurement should be sought wherever possible, thereby suggesting that this is not always possible. For organizations this would imply that working with a universal 'business case' model, which most organizations do in order to be able to compare investments and projects, actually does not lead to optimal decision making.

4.4. Including sustainability criteria expands scope

The logical 'unit of analysis' in business cases is the organization that commissions the project or uses its deliverables. This scope is based on economical reasoning and the concept of ownership. Projects should bring benefits to the economical unit that invests in, pays for or owns the changes that the project aims to realize. In sustainability assessments, however, the sphere of influence is not limited to economical units or ownership. This is covered in the Bellagio principles Holistic Perspective and Adequate Scope. The principle Holistic Perspective mentions that assessment of sustainability should include a review of the whole system as well as its parts. The principle Adequate Scope prescribes that assessment of sustainability aspects should define the space of study large enough to include not only local but also long distance impacts on people and ecosystems. Logically this would expand the scope of the business case beyond the economical unit that commissions the project.

4.5. Including sustainability assessment implies equality of time

The economic perspective, that is so dominant in all business case evaluation approaches, values short term effects more than long term effects. This principle is most visible in the discounting of future cash flows. In economic theory an immediately cash flow holds more value than a future cash flow, thereby emphasizing the value of short-term benefits. However, social impacts or environmental degradation because of business decisions, may not occur before the long-term. Also this aspect is mentioned in the principle Adequate Scope, that states that assessing sustainability should adopt a time horizon long enough to capture both human and ecosystem time scales thus responding to needs of future generations as well as those current to short term decision-making.

4.6. Sustainability assessment implies continuous assessment and institutional capacity

The Bellagio principles Ongoing Assessment and Institutional Capacity prescribe an institutionalized, repetitive and iterative process to assess sustainability aspects. In business case evaluation, this aspect is covered in some of the evaluation methods, most explicitly in the concept of portfolio management. Portfolio management suggests a continuous process of monitoring, measuring, evaluating and selecting investments or assets. In fact, also project management methodologies like Prince2 include a continuous re-assessment of the business case of the project. Assessing sustainability, however, goes even further than this and suggests that the deliverable or result of the project at hand is also continuously assessed during its exploitation. This could be compared with the ‘business case management’ in the post-implementation phase of a project.

4.7. Sustainability assessment implies openness and broad participation

The Bellagio principles Openness, Effective Communication and Broad Participation prescribe how stakeholders are informed and engaged in the assessment of sustainability aspects. These principles touch upon the way assessments are performed. And although these aspects are not explicitly covered in the evaluation methods, the graphical representations that are included in the Information economics methodology do facilitate participation of and communication with key stakeholders and decision makers. It is, however, debatable whether these formats and techniques are an adequate operationalization of the principle Openness.

5. Conclusion

Sustainability is one of the most important challenges of our time. How can we develop prosperity, without compromising our wellbeing or that of future generations? More and more companies recognize this and take responsibility for their role in this challenge. Projects realize changes that are required for the sustainable development of organizations. It therefore makes sense to include an assessment of sustainability aspects in the business cases of projects and the evaluation of these business cases. And although some considerations of sustainability can be found in the various methods of business case evaluation, it has to be concluded that the integration of sustainability indicators in business cases and business case evaluation is just in its infancy.

In a contribution to the understanding of sustainability considerations in business case evaluation, this paper confronted the principles of sustainability assessment with the different methods of business case evaluation. This analysis did not result in a set of additional criteria to be considered, but in a set of observations that form a foundation to reconsider evaluation methods. These observations are:

- Integrating sustainability indicators suggests a multi-criteria approach;
- Inclusion of sustainability indicators makes sense;
- A universal model for evaluating business cases is illusive;
- Including sustainability assessment expands scope;
- Including sustainability assessment implies equality of time;
- Sustainability assessment implies continuous assessment and institutional capacity;
- Sustainability assessment implies openness and broad participation.

The implications of these observations may be far fetching, as their impact suggests a far more holistic and elaborated perspective on business cases and business case evaluation than the current ‘Return on Investment’ perspective. The operationalization of this holistic and elaborated evaluation perspective, however, is still subject to further research.

References

- Barnard, L.T., Ackles, B. and Haner, J.L. (2011). *Making Sense of Sustainability Project Management*, Explorax Group Inc.
- Bell, S and Morse, S. (2003). *Measuring Sustainability Learning from doing*, Earthscan, London.
- Brynjolfsson, E. (1993). “The productivity paradox of information technology”, *Communications of the ACM*, 36(12), pp. 67-77.
- Esty, D. C. and Porter, M. E. (1998) “Industrial Ecology and Competitiveness: Strategic Implications for the Firm”, *Journal of Industrial Ecology*, 2(1), pp. 35-43.
- Frisk, E. (2007). “Categorization and overview of IT perspectives – A literature review.”, Paper read at the European Conference on Information Management and Evaluation, Montpellier.
- Gareis, R., Huemann, M., Martinuzzi, R-A., Sedlacko, M. and Weninger, C. (2011). “The SustPM Matrix: Relating sustainability principles to project assignment and project management”, EURAM11, Tallinn.
- Glenn, J. C. and Gordon, T. J. (1998). *State of the Future: Issues and Opportunities*, The Millennium Project, American Council for the United Nations University, Washington, DC.
- Hardi, P. and Zdan, T. (Eds.)(1997). *Assessing sustainable development: Principles in Practice*, International Institute for Sustainable Development, retrieved from <http://www.iisd.org/pdf/bellagio.pdf>.
- Hedstrom G., Poltorzycki S. and Stroh P. (1998). “Sustainable development: the next generation”, *Sustainable Development: How Real, How Soon, and Who’s Doing What?*, *Prism*, 4: 5–19.
- Holliday C. (2001). “Sustainable growth, the DuPont way”, *Harvard Business Review*, September, pp.129–134.
- International Institute for Sustainable Development (2012). Dashboard for Sustainability, retrieved from <http://www.iisd.org/cgsdi/dashboard.asp>, accessed April 7th, 2012.
- Jain, R. (2005). “Sustainability: metrics, specific indicators and preference index”, *Clean Technologies and Environmental Policy*, May, pp. 71-72.
- Labuschagne, C. and Brent, A. C. (2006). “Social indicators for sustainable project and technology life cycle management in the process industry”, *International Journal of Life Cycle Assessment*, 11 (1), 3-15.
- Lundin R.A. and Söderholm A. (1995). A theory of the temporary organization, *Scandinavian Journal of Management*, 11, 437–455.
- MacGillivray, A. And Zadek, S. (1995). *Accounting for change: indicators for sustainable development*, New Economic Foundation, London.
- Maltzman, R. and Shirley, D. (2010). *Green Project Management*, CRC press, Boca Raton, FL USA.
- Markowitz, H.M. (1952). “Portfolio selection”, *Journal of Finance*, 7 (1).
- Oehlmann, I. (2011). *The Sustainable Footprint Methodology*, Lambert Academic Publishing, Cologne.
- Olsson, J.A., Hilding-Rydevik, T., Aalbu H. and Bradley, K. (2004). “Indicators for Sustainable Development”, Discussion paper, European Regional Network on Sustainable Development.
- Parker, M.M., Benson, R.J. and Trainor, H.E. (1988). *Information Economics, Linking Business Performance to Information Technology*, London: Prentice-Hall.
- Renkema T.J.W. and Berghout, E.W. (1996). “Methodologies for information systems evaluation at the proposal stage: a comparative review”, *Information and Software Technology*, Elsevier.
- Rossum, R.B. van, and Silvius, A.J.G. (2006). “ICT Portfolio Management in theorie en praktijk; Over slagkracht en spraakverwarring”, J. van Bon (Ed.), *ITSM Best Practices deel 3*, Van Haren Publishing (in Dutch).
- Silvius, A.J.G. (2008). “The Business Case in IT projects; New insights into an old problem”, 22nd IPMA World Congress, Rome.
- Silvius, A.J.G. (2012). “Update MAY 2012 Overview of Literature on Sustainability in Projects and Project Management”, Retrieved from <http://www.slideshare.net/GilbertSilvius/update-may-2012-overview-of-literature-on-sustainability-in-projects-and-project-management> on July 2nd, 2012
- Silvius, A.J.G. (2010) “A Conceptual Model for Aligning IT Valuation Methods”, *International Journal of IT/Business Alignment and Governance*, 1(3), IGI Global, Hershey PA.
- Silvius, A.J.G., Schipper, R., Planko, J., van den Brink, J. and Köhler, A. (2012). *Sustainability in Project Management*, Gower Publishing.
- Turner, J.R. and Müller, R. (2003). On the nature of the project as a temporary organization, in *International Journal of Project Management*, vol. 21, no. 3, pp.1–8.
- United Nations Global Compact (2010). *UN Global Compact*, Retrieved 22-10-2010, from [globalcompact: http://www.unglobalcompact.org/AboutTheGC/index.html](http://www.unglobalcompact.org/AboutTheGC/index.html).

- Visser W.T (2002). “Sustainability reporting in South Africa”, *Corporate Environmental Strategy*, 9(1), pp.79-85.
- Warren McFarlan, F. (1981). “Portfolio Approach to Information Systems”, *Harvard Business Review*.
- Wetherbe, J.C., Turban, E., Leidner, D.E. & McLean, E.R. (2007). *Information Technology for Management: Transforming Organizations in the Digital Economy* (6th ed.). New York: Wiley.
- World Commission on Environment and Development (1987). *Our Common Future*. Oxford University Press, Oxford.