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Creating a Taxonomy of Corporate Social Responsibility, Sustainability, Stakeholders, Environment, Green IS, and Green IT: A Literature Review

Mauricio Marrone

Macquarie Graduate School of Management, mmarron@uni-goettingen.de

Nils-Holger Schmidt

University of Goettingen, nils-holgerschmidt@web.de

Janis Kossahl

University of Goettingen, jkossah@uni-goettingen.de

Lutz M. Kolbe

University of Goettingen, lkolbe@uni-goettingen.de

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Creating a Taxonomy of Corporate Social Responsibility, Sustainability, Stakeholders, Environment, Green IS, and Green IT: A Literature Review

Mauricio Marrone

Macquarie Graduate School of Management, Australia

Nils-Holger Schmidt

University of Goettingen, Germany

Janis Kossahl

University of Goettingen, Germany

Lutz M. Kolbe

University of Goettingen, Germany

Abstract

The main goal of this article is to link Green Information Systems (Green IS) and Green Information Technology (Green IT) to the overall sustainability topic. Therefore, the authors provide a taxonomy in the form of a matrix to relate the relevant concepts to each other. The quest is to identify missing relationships and establish concepts relationships. Papers from six major journals and one conference between 2006 and 2010 were examined in order to shed light on the relationship matrix. The article delivers definitions, insights into usage of terminology and existing boundaries and links amongst definitions. Besides the comprehensive overview, the authors were able to identify new links between the relevant terms. This was done by reversing given relationship definitions between the relevant terms and by using analogies.

Keywords: Glossary and Taxonomies, Relationship Matrix, Green IT, Green IS, Sustainability

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1. Introduction

The increasing dissemination of Information Systems (IS) into all areas of business and personal life has drawn attention to its environmental effects (Watson et al. 2010; Melville 2010). A large number of organizations are becoming aware that they have to take up their responsibility by thinking seriously about sustainability management of IS. While technical measures for using computing resources efficiently have received considerable attention, the topic of sustainability in IS management is still lacking theoretical foundation. Sustainability has been extensively discussed within corporate management under the synonyms of corporate social responsibility (CSR), greening the business, eco-efficiency or eco-advantage (Epstein 2008; Esty & Winston 2009). Although many studies concerning sustainability have been introduced, it has not been clearly related to Green IT and Green IS until now. The aim of this research is to provide a taxonomy for linking all relevant concepts in this knowledge domain. This is done by a thorough bibliographic analysis on the main terminology of corporate sustainability.

The objective of this paper is to:

- identify missing relationships or entities and
- establish how concepts and relationships could be described.

By doing this we provide a comprehensive structure for a yet very fuzzy field of research. This leads towards more standardization in the use of the diverse terms and implies new areas for future research. Our map will help practitioners to structure their own organization and responsibilities accordingly.

2. Methodology

Our main goal is to link Green IT and Green IS to the overall corporate sustainability movement. This is done by a literature review following Webster and Watson (2002). Through a review of three major IS journals (MIS Quarterly, Information Systems Research Journal and Information and Management), the leading IS Conference (International Conference on Information Systems) and three major management journals (Administrative Science Quarterly, Academic Management Journal and Academic Management Review) we compile the definitions utilized for the terms: corporate social responsibility, sustainability, environment, stakeholder, Green IS, and Green IT.

The time period that is considered for this study comprises journals and conference proceedings which were published from 2006 to 2010.

The search resulted in 94 relevant papers (see Appendix) from six journals and one conference. These publications were scanned for described relationships between two or more terms also considering the additional terms "IT" and "IS".

The following two approaches for the identification of relevant literature are utilized

- 1) Identification of relevant articles in leading journals by searching the body text for relevant terms
- 2) Go backward approach by means of reviewing the citations used by the articles to describe the term

We will outline the definitions that are often found for these terms. Through the collation of the definition we will attempt to model the scope of each definition and create clear boundaries and links amongst these. The paper also creates a congregated definition for these terms based on previous definitions. Our research will provide a taxonomy for all terms. This will give IS researchers and IS professionals orientation and enable them to overlook the Green IT and Green IS research area and relate their activities to it.

3. Terminology

Below we list the most important definitions found for the terms corporate social responsibility, sustainability, environment, stakeholder, Green IS, and Green IT. To highlight the relation to IS and IT we also included these terms. Since the terms IT and IS are often used synonymously in IT and IS academic publications, we have decided to split these terms. We look at definitions provided for both Green IT and Green IS. The findings of definitions from our literature review are shown below.

3.1. Corporate Social Responsibility

Three definitions were gathered for the term “Corporate Social Responsibility”.

The paper titled “Corporate Social Responsibility: The Good, the Bad and the Ugly” written by Subhabrata Bobby Banerjee (2008) suggest that CSR is a “*discourse designed to mask a corporation’s more insidious activities*”.

A more positive definition is given by Hiatt, Sine, & Tolbert (2009) who argue that CSR “*refers to a company’s performance on a range of social and environmental issues over time*”. Campbell (2007) says that CSR are “*actions taken by a firm that are intended to further social welfare beyond the direct economic, technical, and legal interests of the firm*”. Scherer and Palazzo (2007) define CSR from a positivist perspective stating that it is the “*result of power games between the firm and its stakeholders*”.

Furthermore, CSR efforts should reflect a business’s mission, values and identity orientation (Brickson, 2007).

Molla, Cooper & Pittayachawan (2009) state that CSR and compliance with new stringent energy legislation and regulations will force governments and business alike to reduce their impact on the environment through sustainable policy, energy efficiency and by following environmentally safe practices (Molla et al. 2009). With special emphasis on IT, Molla, Cooper & Pittayachawan (2009) see a development where “*CSR and environmental sustainability should be extended to IT too.*”

3.2. Sustainability

According to Russo (2003), the term sustainability has “*acquired [...] many overlapping definitions.*” An appropriate definition is proposed by the World Commission on Environment and Development (1987) who suggest that sustainability is “*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*”.

Dyllick and Hockerts (2002) identified three goals of sustainability: eco-efficiency, eco-equity, and eco-effectiveness. Eco-efficiency is “*the delivery of competitively-priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life-cycle to a level at least in line with the earth’s carrying capacity*”. Eco-equity refers to the “*equity between peoples and generations and, in particular, the*

equal rights of all peoples to environmental resources" (Gray & Bebbington, 2000). Lastly, eco-effectiveness, introduced by McDonough et al. (2003) is explained as *"working on the right things—on the right products and services and systems—instead of making the wrong things less bad."*

Watson et al. (2010) goes on to propose that *"seeking sustainability does not mean abandoning economic thinking"*.

With regards to IT, Molla et al. (2009) implied that sustainability issues *"need to be incorporated within the IT technical and human infrastructure and IT managerial capability dimensions of the IT infrastructure to solve both IT and non-IT (by using IT) related sustainability problems"*.

As proposed by Enkvist et al. (2007), sustainability has a *"fundamental impact on key issues of business strategy, such as production economics, cost competitiveness, investment decisions, and the value of different types of assets"*.

With a focus on IT, Watson et al. (2010) states that *"IT investments are growing, and sustainability requires a reduction in computer related energy consumption"*. This can be seen as a direct link to Green IT.

3.3. Environment

The environment can be seen as an important part of sustainability. In the given context environment is defined as *"one of the three pillars of sustainability"*. (Molla et al. 2009)

3.4. Stakeholder

A stakeholder is *"any group or individual who can affect or is affected by the achievement of the organization's objectives"* (Freeman, 1984).

The overall goal in the case of Green IS and Green IT is to increase energy efficiency and reduce CO₂ emissions (Watson et al., 2010). The way in which the system will achieve these goals is dependent on a blend of external forces. These forces are shaped by major stakeholders. In the context of Green IS and Green IT, Watson et al. (2010) identify three most critical stakeholders in the typical energy supply/demand system: suppliers, consumers, and governments.

Scherer and Palazzo (2007) highlight the influence of stakeholders on CSR. They consider *"not only power but also legitimacy and urgency of stakeholder claims as explanations for responsible business behaviour"*. Stakeholder influence capacity can also explain how corporate social responsibility is transformed to achieve corporate financial performance (Bies et al., 2007).

Melville (2010) describes the relationship between sustainability and stakeholders. Organizations pursue sustainability by informing stakeholders of the need to make changes to business as usual, by motivating them to take actions to achieve environmental objectives, and by assessing the impact of such actions on economic and environmental performance (Melville, 2010).

3.5. Green IS

The clearest definition of Green IS and its standing with regards to IT is provided by Watson et al. (2010). They propose that: *"Green IS is inclusive of Green IT [...]. We argue that this exclusive focus on information technologies is too narrow and should be extended to information systems, which we define as an integrated and cooperating set of people, processes, software, and information technologies to support individual, organizational, or societal goals. To the commonly used Green IT expression, we thus prefer the more encompassing Green IS one"*.

Quoting Boudreau et al. (2008) and Molla et al. (2009), Chen et al. (2009) unite the terms of Green IT and Green IS and suggest that: *“Green IS & IT refers to IS & IT products (e.g., software that manages an organization’s overall emissions) and practices (e.g., disposal of IT equipment in an environmentally friendly way) that aims to achieve pollution prevention, product stewardship, or sustainable development”*.

3.6. Green IT

Hedwig et al. (2009) propose that the term Green IT *“denotes all activities and efforts incorporating ecologically friendly technologies and processes into the entire lifecycle of information and communication technology.”*

Molla et al. (2009) argue that Green IT *“is a multifaceted construct that is intended to address both IT and non-IT (by using IT) related sustainability problems”*.

Also the term does *“encompass not only hard technological solutions but also soft business practices in acquiring, using and disposing IT”*. The authors argue that the term Green IT should go beyond initiatives to *“reduce the power, cooling and real estate costs associated with data centre operations”*. They suggest that *“Green IT is a systematic application of environmental sustainability criteria to the design, production, sourcing, use and disposal of the IT technical infrastructure as well as within the human and managerial components of the IT infrastructure in order to reduce IT, business process and supply chain related emissions and waste and improve energy efficiency”* (Molla et al. 2009).

Furthermore, the authors state that:

“Green IT refers not only to Greening the IT artefact but also to using IT to achieve sustainability in business and supply chain processes. Further Green IT includes hard technologies as well as soft systems and business practices spanning the IT lifecycle from sourcing through building and use to disposal” (Molla et al. 2009).

Similarly Watson et al. (2010) recommend that the

“ exclusive focus on information technologies is too narrow and should be extended to information systems, which we define as an integrated and cooperating set of people, processes, software, and information technologies to support individual, organizational, or societal goals”.

3.7. Information Systems

Melville (2010) highlights the relationship between sustainability and IS: *“From a sustainability perspective, IS enables firms to standardize, monitor, capture, and utilize data and metadata that facilitates energy efficiencies. Overall, however, the role of IS may have dual effects. The first is to increase energy use [...]. The second is to decrease energy use by dematerialization”* (Melville, 2010).

IS can also be seen as a weapon of organizations in *“their quest for environmental sustainability by enabling new practices and processes in support of belief formation, action formation, and outcome assessment”* (Melville, 2010).

3.8. Information Technologies

Molla et al. (2009) emphasize on the link between IT and sustainability. According to them *“...organization’s IT applications can be directed towards solving sustainability problems”* (Molla et al. 2009). Concerning organizational issues assume Molla et al. (2009) that *“...Greening IT will touch many other areas and can have significant impact on the overall sustainability of a business”*.

1. \ 2.	...CSR	...Sustainability	...Stakeholder	...Environment	...Green IS	...Green IT	...Information Systems	...Information Technologies
CSR...		forces to reduce negative impact on	is a result of power games between the firm and its / is transformed by the influence of	forces to reduce negative impact on the (Molla et al. 2009)	can be supported by	can be supported by	should be extended to	should be extended to (Molla et al. 2009)
Sustainability...	is achieved by		pursued by informing (Melville, 2010)	consists of three pillars, one being the	is addressed by / is impacted by / is achieved by	is addressed by / is impacted by / is achieved by	is dual affected by / is supported by	needs to be incorporated in (Molla et al., 2009) should be extended to (Molla et al., 2009) requires a reduction in computer related energy consumption (Watson et al. 2010) is supported by
Stakeholder...	power, legitimacy and urgency explain behaviour in (Scherer & Palazzo, 2007) influence, transforms (Bies et al., 2007)	demand information about		influence the protection of	provide directions for	provide directions for	demand information about / are informed by	demand information about / are informed by
Environment...	to be positively impacted by	is one of the three pillars of (Molla et al., 2009)	is influenced by / interests of		is impacted by / is supported by	is impacted by / is supported by	can be influenced by	can be influenced by
Green IS...	can support	is intended to address problems related to / can have a significant impact on / is using IS to achieve	is dependent on (Watson et al., 2010)	impact the / support the		is inclusive of (Watson et al. 2010)	is an application of environmental sustainability criteria to / denotes all activities and efforts incorporating ecologically friendly activities into	is an application of environmental sustainability criteria to / denotes all activities and efforts incorporating ecologically friendly activities into
Green IT...	can support	is intended to address problems related to / can have a significant impact on / is using IT to achieve (Molla et al., 2009)	is dependent on	impact the / support the	is part of		is an application of environmental sustainability criteria to / denotes all activities and efforts incorporating ecologically friendly activities into	is an application of environmental sustainability criteria to the design, production, sourcing, use and disposal of (Molla et al., 2009) denotes all activities and efforts incorporating ecologically friendly technologies and processes into the entire lifecycle of (Hedwig et al., 2009)
Information Systems...	need to align to	have dual effects on / enable practices and processes to achieve (Melville, 2010)	can be of interest to / help to inform	can influence the	is influenced by the criteria of / is subject to	is influenced by the criteria of / is subject to		is inclusive of
Information Technologies...	needs to align to	solving problems related to (Molla et al., 2009)	can be of interest to / help to inform	can influence the	is influenced by the criteria of / is subject to	is influenced by the criteria of / is subject to	is part of	

Table 1: Relationship matrix of key concepts

4. Findings

Drawn on the definitions above, the terms to be defined are commonly not described in relation to other concepts. Due to that, the different concepts seem either to overlap, without a link to each other or somewhat disconnected. As an outcome of the literature review, the dependencies map, shown on Table 1, illustrate how the different concepts are related to each other.

The light grey fields indicate that a definition of the relation was not found in the literature, but could be derived by the authors from the reverse combination or conclusion by analogy. The relationship matrix is read from left to right, in the following way: *“Green IS is inclusive of Green IT”*, as stated by Watson et.al. (2010), on the other hand, it can be stated that *“Green IT is part of Green IS”*. Using these relations, a concept map, shown on Figure 1, was developed.

The matrix and concept map shows that that some definitions amongst the terms do exist, however, other definitions were not gathered by the method used (e.g. the relation between IS and IT). As well, the missing link between Green IT/IS and the mayor terms of the sustainability topic such as the terms CSR and environment became apparent.

The described relations in the light grey fields can be seen as assumptions. Further research needs to describe the interdependencies of the relevant terms in more detail, so that they finally can be verified or rejected.

The relationship matrix shows that there is little difference between Green IS and Green IT. Although the definitions of these terms are different, they don't differ in their relationship to other important terms such as CSR, sustainability, or stakeholder. A reason for this might be that the broader concept of Green IS has not yet attained the same attention as the more prominent Green IT concept. Future definitions of Green IS and Green IT need to relate the terms more accurately to other important concepts. This would help to differentiate Green IS and Green IT from each other.

Forty-three new assumed relationships could be derived by the analysis of the definitions found in the literature examined. This indicates that the method used is a reasonable way for creating a taxonomy.

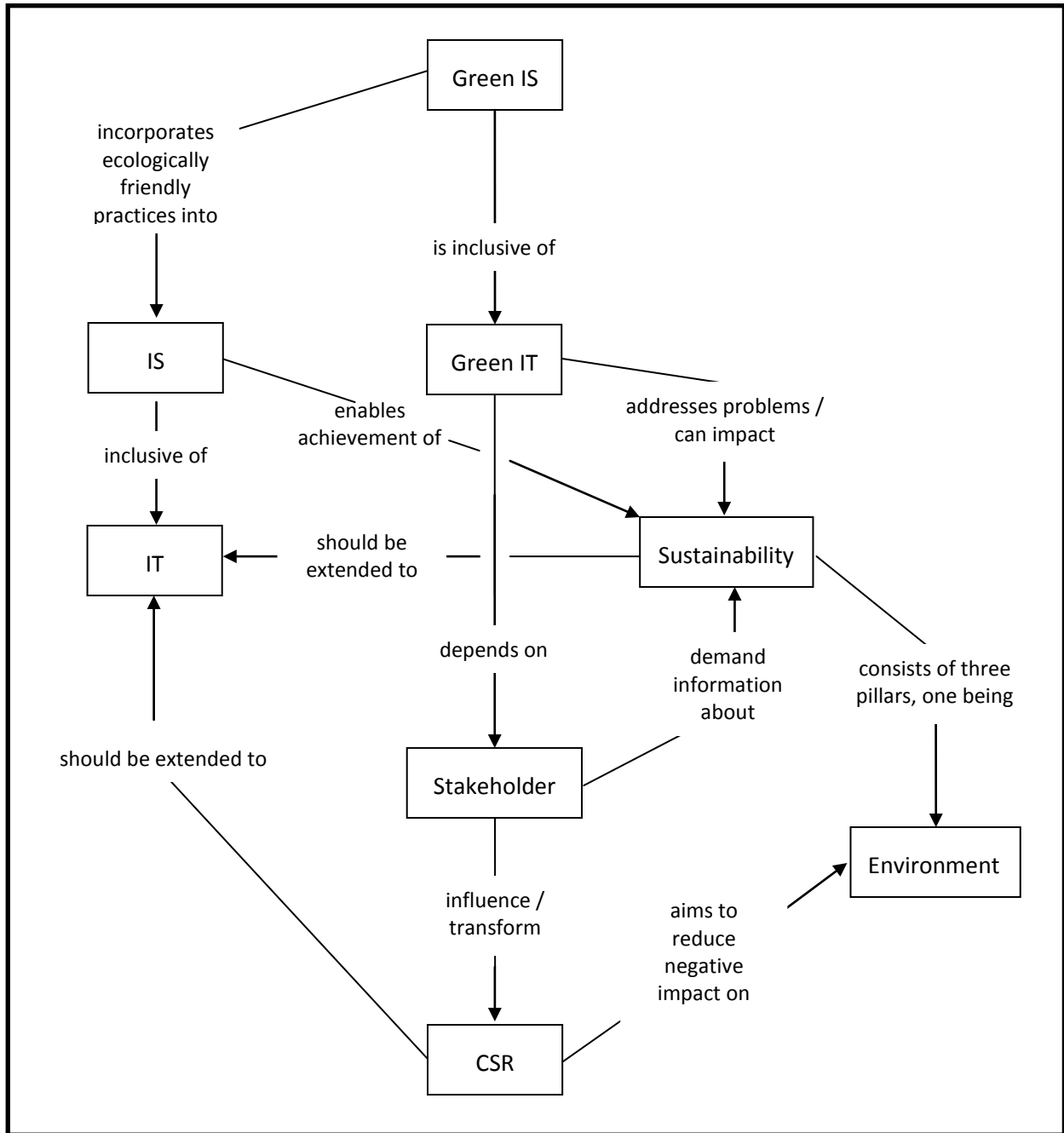


Figure 1: Concept map of key concepts

5. Conclusion

The taxonomy strives to give an initial overview about the existing links of the different concepts from the scope of Green IS and Green IT. Fields, which are light grey indicate definition gaps, where further research needs to be conducted. Until now these links are not sufficiently defined towards each other in the reviewed literature. This provides new opportunities for further research in this field.

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