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SUSTAINABILITY: AN ANALYSIS OF ORGANIZATIONAL REPORTING AND IMPLICATIONS FOR ERP SYSTEMS

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ABSTRACT

Given the increasing interest in sustainability, many companies are voluntarily producing sustainability reports for the general public. Companies generate these reports as a mechanism to signal environmental and global commitment to the public. Individuals use information from these reports to form thoughts on whether to purchase products or services from companies or whether to invest in the company. There is much variation in what sustainability means in the context of a business; therefore, reporting processes differ between companies. This paper presents the results of a content analysis of 15 sustainability reports which yielded 145 unique activities. These results are assisting us as we develop and validate an instrument of the most important activities in various sustainability dimensions. Using the finalized activities we will make inferences for ERP vendors in designing functionality to capture sustainability measures. Our findings will guide researchers and practitioners in measuring the dimensions of sustainability and using ERP systems to support sustainability reporting.

Keywords

Sustainability, survey, ERP systems

INTRODUCTION

Companies are experiencing increasing pressure to adopt sustainable practices and are making sustainability a strategic goal in order to maximize firm shareholder value. This value comes from reduced expenses resulting from more efficient use of resources and from an improved public image and increased brand reputation. Embracers of sustainability practices also see it as crucial to their ability to grow. For instance, according to the VP of brand and global corporate responsibility at Unilever, Santiago Gowland, "The only way to continue growing and continue being a successful business is to treat sustainability as a key business lever in the same way that you treat marketing, finance, culture, HR or supply chain" (MIT Sloan Review and The Boston Consulting Group). It is becoming common practice for companies to appoint a sustainability officer to lead the charge and to describe their sustainability activities in a publicly available sustainability report. There are various names given to such reporting - the most commonly used are sustainability reporting, non-financial reporting, corporate social responsibility (CSR) reporting and triple bottom line reporting. Companies are also moving towards integrated reports (where the sustainability report is incorporated into the financial reports) (Melville, 2010; South African Institute of Chartered Accountants, 2011).

Among the many ways that sustainability has been defined, the simplest and most fundamental is: "the ability to sustain" or, put another way, "the capacity to endure." From an ecological perspective we consider how diverse biological eco-systems (including human beings as a part of those eco-systems) remain active, productive and strong over an extended period of time. From an environmentalist perspective we consider reducing the impact of human beings, both as individuals and as a species, on the ecosystems of the planet. From a conservationist perspective, the focus is on protection and restoration of the natural environment, for the benefit of everything inhabiting that environment. From a corporate perspective it is seen as the ability of an organization to continue to create shareholder value over the long term. However, when most people think about sustainability, they think of the environment. In the IS literature the concept of Green IT has received considerable attention (e.g., Watson, Boudreau and Chen 2010; Rayman and Akhter, 2010). The more general view of sustainability, that of societal issues, however, has not received significant attention from the IS community and guidance is lacking in the literature on what facets are important to the general public and how companies can more efficiently provide this information via their enterprise systems.

Guidance regarding sustainability reporting comes from a framework developed by the Global Reporting Initiative1 (GRI), an Amsterdam-based nonprofit organization comprised of business, government, social advocacy and other stakeholders (Liebs, 2007). While sustainability reporting in the US is currently voluntary, 1500 companies from 60 countries make their reports available through the GRI, where the reports are verified to ensure they match the GRI framework. The data, however, is not verified. Companies are rated on how many indicators they measure and how many areas of the framework they address, but are not required to obtain external assurance from a third party. The GRI identifies nearly 80 performance indicators that need to be measured in the dimensions of environmental, economic, and social (Liebs, 2007). The social dimension is further broken down into human rights, labor, society, and product responsibility subcategories. Commonalities among the perspectives mentioned previously include the following: reduced use of scarce resources such as oil and water; reduced damage to natural environments; increased emphasis on human rights, including reducing poverty, eliminating disease; and worker health and safety. The latest GRI Reporting Statistics reveal that 45% of all reports are issued by European companies and the majority of all reports are "self declared" at this point (not checked by any third party) (Global Reporting Initiative, 2010).

From an information systems perspective, this reporting process can be streamlined if organizations will utilize the cross-functional features of ERP systems. ERP systems provide a cross-functional view of the entire organization and can provide a mechanism to understand and reinvent business processes to better support sustainable practices (Watson, Boudreau and Chen 2010). As ERP systems are the bastion of data for today's organizations, it makes sense that sustainability data should be captured, stored, processed, and shared using ERP as well as exchanged electronically with the company's supply chain, customers and other business partners. However, recent research has shown that very few companies are currently using ERP systems for sustainability reporting (Affinity and IFS North America, 2010). According to the 2010 survey of manufacturers conducted jointly by IFS North America (a subsidiary of a provider of enterprise systems) and Affinity Research Solutions (a marketing and research firm), 68% say they make purchasing and sourcing decisions based on environmental impact, carbon footprint or other non-financial requirements or that they are part of a green supply chain where at least one of their customers require information on the chemical makeup of their products as well as their company's environmental impact. While 77% of manufacturers surveyed said they already track and/or share environmental impact information with supply chain partners and/or customers, the vast majority are using manual methods where they enter the information from hard copy into spreadsheets (28%) or into supply chain management software (15%) or into an ERP system (20%). Approximately a fourth (23%) use paper-based systems to manage sustainability information. Only 12% of them use ERP to communicate pertinent KPIs with their trading partners. Certain aspects of sustainability are being tracked and reported as a response to regulations that are impacting manufacturing companies today including the Clean Water Act, Restriction of Hazardous Substances (RoHS), Clean Air Act and the Hazard Communication Standard (Material Safety Sheet) (Affinity and IFS North America, 2010). While companies are voluntarily reporting this information today to their shareholders and other interested parties, in the near future it is likely that the information will be mandated and require audit.

In this paper we present research that investigates the content of sustainability reports made publicly available in 2011 at the GRI website. In particular, we address our initial research question: What sustainability activities are organizations presenting in their sustainability reports regarding the various dimensions of sustainability and what, in particular do individuals believe is the most relevant? Results from this phase of the study will inform us as we develop a framework and guidance on using enterprise wide systems, such as ERP, to facilitate sustainability reporting.

METHODOLOGY

What are Companies Reporting?

The GRI maintains a Sustainability Disclosure Database that provides access to an abundance of sustainability information as reported by various organizations. There are 944 reports available for 2011 (worldwide). Any organization that has published a sustainability report is eligible to register their report with the GRI database. Reports can follow GRI Guidelines or can follow other guidelines such as those in ISO26000, the Carbon Disclosure Project, OECD Guidelines for Multinational Enterprises, the United Nations Global Compact and IFC Performance Standards (GRI, 2011). The reports should feature disclosures around multiple issues as mentioned previously including environmental, economic and society.

We used a content analysis approach to answer our primary research question: What activities are companies presenting in their voluntarily disclosed sustainability reports? Content analysis is a grounded theory approach (Glaser, 1967) for making valid inferences from text-based data (Krippendorff 1980). We used a diverse sample in our analysis, as well as a purposeful

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[1] www.globalreporting.org

sampling strategy to capture heterogeneity (Maxwell 1996). We identified 15 organizations from a variety of industries (e.g., automotive, retail, telecommunication, financial) to complete our analysis. See Table 1 for the list of organizations analyzed.

Abbott	Dresser-Rand	LG Electronics
Alcoa	ExxonMobil	Mohawk
AT&T	FifthThird	Toshiba
Caterpillar	Haworth	Volkswagon
Coke Bottling	Intel	Wal-Mart

Table 1. Company Sustainability Reports Analyzed

We read each report (reports were between approximately 40-100 pages) and categorized each statement pertaining to a company's policy, program, or action as belonging to one of the following categories in the GRI framework: Economic, Environment, Human Rights, Labor, Product Responsibility, Society or not applicable to sustainability. Additionally, through our content analysis of these reports we identified another dimension that companies listed activities under, that of governance. We then reconciled similar activities from companies into a single, common statement. For example, one report stated that the company continually improved its safety practices, processes and performance while another company stated that they did daily safety walkthroughs in facilities to identify and correct problems. We identified these two statements as being Labor activities and similar enough that we combined them into a single statement. This resulted in 145 unique sustainability activities represented in the 15 reports. The results of the initial analysis are presented in Table 2. As expected, the majority of sustainability activities reported belongs to the Environment category followed by Economic. Table 3 presents examples of KPIs measured and reported by companies as revealed through our content analysis.

Category	Number of Unique Activities Reported
Economic	27
Environment	23
Human Rights	8
Labor	25
Product Responsibility	13
Risk	14
Society	35
Total Sustainability Ideas Analyzed	145

Table 2. Initial Content Analysis of Sustainability Activities

As a means to validate our categorizations, our next step involved a focus group approach with 28 individuals familiar with corporate reporting and sustainability. Each participant read the 145 statements and categorized each one as belonging to a certain dimension, more than one dimension, or not applicable to sustainability. As of submission time, we are in the process of merging the focus group results with our own categorizations. Once we have established the types of activities that belong to the different categories, we will continue our survey methodology as illustrated in Figure 1 (Churchill, 1979; Straub, 1989). This will allow us to measure the perspective of general consumers and investors as it relates to sustainability activities. The ultimate goal of our research is to determine the dimensions of sustainability develop and validate an instrument that identifies and measures the primary dimensions of individual's perspectives about sustainability practices, and provide guidance as to how ERP systems can be reengineered to facilitate the reporting process by automatic population of the required information.

Category	Sustainability Activity

Economic	Promote policies that reduce or eliminate trade and investment barriers.
Environment	Treat 100% of wastewater before returning it to the municipality or ecosystem
Human Rights	Support and obey laws that prohibit discrimination everywhere we do business
Labor	Continually improve safety practices, processes and performance
Product Responsibility	Run safety campaigns to prevent injuries from product related accidents
Governance	Top executives set tone for ethical culture and role-models ethical behavior
Society	Achieve higher rates of hiring and promoting women in the workforce

Table 3. Example Sustainability Activities from Content Analysis of Reports

CONCLUSION AND FUTURE WORK

This study will provide three major contributions to the sustainability literature: 1) a framework describing the main dimensions of individual's concerns about company sustainability activities and 2) a scale for measuring those concerns and 3) inferences for ERP vendors as to what type of information is most critical to report from the ERP system. It is beneficial to companies that they have information systems that can capture this data automatically, report it easily and share it with necessary parties. Some major ERP vendors as well as "best of breed" vendors have currently developed or are developing "bolt on" sustainability applications to perform analytics on certain KPIs. However, according to one source, if putting sustainability in ERP is going to be done right, the ERP system itself must be reengineered to capture this data. Sustainability issues need to be embedded into business process redesign, especially where the KPIs that measure sustainability "shout to be addressed" (Doan, 2009). For instance, ERP software solutions need to be built that answer questions such as:

- Which products should we <u>not</u> make (because the carbon footprint is just too high)?
- Which plants, work centers, operations should <u>not</u> be used so as to achieve certain ecological outcomes?
- What are the true costs of a product including costs for carbon offsets?
- How can we optimize production scheduling so that we lower emissions (Sommer, 2009)?

To answer these questions and more regarding sustainability, requirements need to be built into core modules such as material management, quality management, production planning, cost accounting, fixed assets, and various supply chain modules. Tracking sustainability measures is more than a reporting exercise, but must be embeded into the business processes of a company. As well, data fields must be added in master data views of materials, work centers, operations, fixed assets, cost centers etc. If possible, data must automatically be populated instead of captured on hard copy and later input. For instance, the time of day a product is made (e.g., some products may be made at night with hydroelectric power instead of daytime production using natural gas powered electricity) should be automatically captured in ERP instead of later collected and input after the fact (Sommer, 2009). When new legislation is enacted (e.g., Cap and Trade) ERP vendors will need to deliver functionality immediately, thus an examination of sustainability from a systems perspective is urgently needed.

Phase 1:

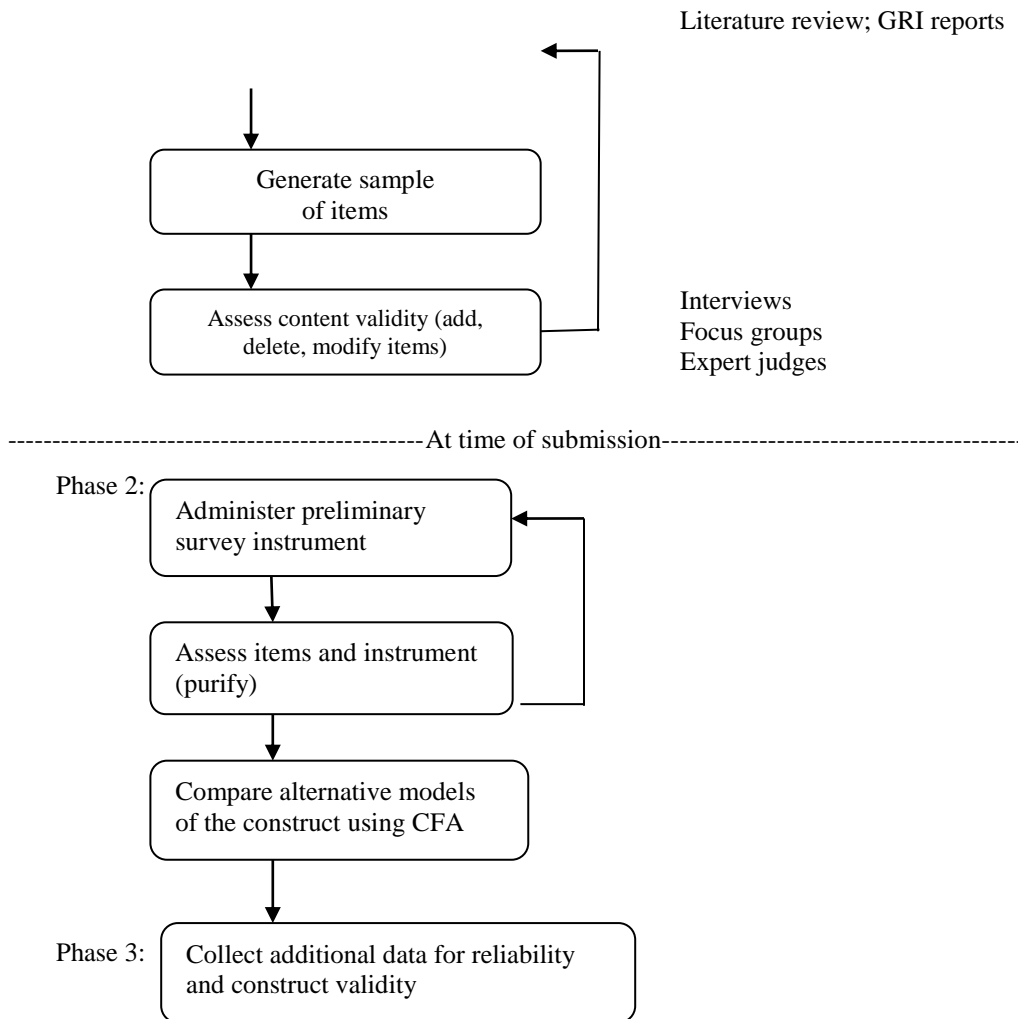Specify the dimensionality of
the construct

Literature review; GRI reports

Generate sample
of items

Assess content validity (add,
delete, modify items)

Interviews
Focus groups
Expert judges

---At time of submission---------------------------------------

Phase 2:
Administer preliminary
survey instrument

Assess items and instrument
(purify)

Compare alternative models
of the construct using CFA

Phase 3:   Collect additional data for reliability
and construct validity

Figure 1. Instrument Development and Validation Process

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