Electronic Integration of CSR Reporting Systems for Stakeholder Responsiveness

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**Abstract**

This paper examines the role of information systems in corporate social responsibility (CSR) reporting, also referred to as sustainability reporting, during ongoing processes of stakeholder engagement. It builds theory on the extent that CSR reporting systems should be electronically integrated with other enterprise systems, and how to optimize the design and incremental improvement of these systems. The ten propositions it develops also address the need for the IT, Sustainability, and Public Relations departments to share a common vision of the degree that the organization should be transparent, and the potential dysfunctions that can result when they do not. CSR reporting is important because it is the principal mechanism by which companies’ CSR practices are recognized and rewarded by their stakeholders.

**Keywords**

Corporate social responsibility, sustainability reporting, electronic integration, stakeholder engagement

**Introduction**

Firms are engaging in sustainable practices because their stakeholders expect it and because it can create organizational value (Klettner, Clarck and Boersma, 2014). In the academy, researchers are finding that over the long term, sustainability improves firm performance (Eccles, Ioannou and Serafeim, 2014; see Albertini (2013) and Orlitzky, Schmidt and Rynes (2003) for meta-analyses). Sustainability has also been found to foster consumer and employee engagement (e.g. Hoeffler, Bloom and Keller, 2010), increase customer loyalty (e.g. Du, Bhattacharya and Sen, 2007), enhance corporate reputation (e.g. Yoon, Gurhan-Canli, and Schwarz, 2006), lower firm-idiosyncratic risk (e.g. Luo and Bhattacharya, 2009), increase profits (e.g. Husted and Salazar, 2006; Siegel and Vitaliano, 2007), and attract and retain talent (e.g. Greening and Turban, 2000). Importantly, a stream of financial research finds that firms that get high ratings from sustainability analysts have a lower cost of capital (Dhaliwal, Li, Tsang and Yang, 2011; El Ghoul, Guedhami, Kwok and Mishra, 2011). Sustainability analysts heavily utilize firms’ sustainability reports in the process of generating these ratings.

**CSR Reporting**

In 2013, 93% of the 250 largest corporations in the Fortune Global 500 filed sustainability reports with formal standards organizations, 82% of these specifically with the Global Reporting Initiative (GRI), and 56% percent with external assurance (KPMG, 2013). This emergent phenomenon has grown rapidly from about 33% percent in 2005 (KPMG, 2008). The GRI is the world's most widely used voluntary sustainability reporting framework (Levy, Brown and De Jong, 2010; Manetti and Becatti, 2009; Reynolds and Yuthas, 2008) and has become the de facto standard (Hahn and Kuehnen, 2013). The current version of the GRI voluntary reporting standard includes 91 specific indicators, over 70 of which require some quantitative data, typically on costs, resource usage, waste and emissions, employee statistics, fines, etc., as well as qualitative information on issues such as policies, arrangements, etc. Reporting companies are not required to report on every indicator, but even so these reports are very resource intensive to produce, reflecting months of data and information collection. Due to the
CSR Reporting Systems’ Integration

magnitude of this reporting endeavor, companies use a software application to aggregate and store their CSR data and information and to produce the actual reports; GRI reporting firms select this software from the list of GRI-approved vendors. Firms also file reports with other standards organizations, such as the Carbon Disclosure Project, the United Nations Global Compact, the Dow Jones Sustainability Index, the Sustainability Accounting Standards Board, and others. The CSR-reporting software has multiple templates, making it easy for firms to report to multiple standards organizations once they have collected the necessary data. The CSR-reporting software, and the database that is integrated with it, serves as an information technology (IT) artifact that spans the boundary between the sustainability function and the public relations (PR) department, as well as the other business units that supply the information needed to populate it. Because the GRI is designed to reward transparency, a company in a dirty industry, or a firm that isn’t sustainable yet but can demonstrate progress towards being so, can get a high score from the GRI. High scores read favorably to CSR analysts that produce the sustainability ratings that the socially responsible investment community uses to assess firms for inclusion in (or exclusion from) their financial products, resulting in significant premiums in financial markets (Berthelot, Coulmont and Serret, 2012). Thus it is not just sustainability practices that affect firms’ cost of capital, but sustainability reporting as well.

The Boundary-spanning IT Artifact: CSR-reporting Software

Within organizations, sustainability reporting software is used to gather, aggregate and report the data and information needed to comply with the formal reporting standards of organizations such as the GRI. CSR-reporting software does not measure nonfinancial information, as the technologies for doing so are still in development (Simnett, 2009). They simply support the collection and storage of structured data and information from throughout the organization. For example, they are used to collect the quantitative environmental measures of resource usage, waste and emissions from the firm’s environmental management system. They amass labor statistics from the company’s human resource system, and supplier statistics from operating systems, or suppliers can enter data themselves over the Internet. Other data are collected from various other intra-organizational systems such as sustainability project management systems and others. Because the reporting indicators are broadly encompassing, ranging from environmental and labor practices to supply chain contracting and political engagement, the IT artifact supports data gathering from virtually all company functions.

CSR-reporting systems are designed for maximum flexibility, because the standards for reporting are evolving quickly and vary depending on the standards organization, and because newly-reporting companies will store much less data and information than firms at higher levels of disclosure. Their flexible design means that companies do not have to collect any data or information on indicators that they choose not to. Most of these systems allow companies to format fields for collecting data on new indicators that they are not currently reporting on, or on indicators that are not even included in standards’ templates, essentially “making up” new indicators for their own use. Depending on the software product used, there may be a limit to how granularly the data can be collected: Some have an inherent temporal periodicity of one month, while others allow for greater update frequency. These systems are aggregation systems, designed for responding to requests for trend information derived from quantitative data over time, for example improvements in emissions, or a more diverse workforce. In this way they are platforms of social and technical arrangements that, with the appropriate processes, structures and cultures, can function as generative memories (Garud, Gehman and Kamaraswamy, 2011).

These systems serve three purposes. First, they store data and information in order to produce current and future CSR reports. Second, they can provide those in the PR function with a repository of content to access during stakeholder engagements and with which to respond to stakeholder requests for information. Third, the system serves as a boundary object that enables knowledge transfer and transformation among all functions involved in producing content for stakeholders: the sustainability and PR functions, and also the executive leadership and risk/compliance officers. Within each of the functions that share data with it and withdraw information from it, it is localized, embedded, and invested, and is thus susceptible to the negative consequences that often arise at problematic knowledge boundaries (Carlile, 2002). As a boundary object, the CSR-reporting IT artifact enables representation, learning and knowledge transformation to resolve these negative consequences. Because the artifact is
also an information technology (IT), it facilitates sharing of information (Fuller, Mirhlbacher, Matzler and Jawecki, 2009), makes the process environment conducive for value co-creation (Aarikka-Stenroos and Jaakkola, 2012) and can play an important role in enabling organizational agility (Sambamurthy, Bharadwaj and Grover, 2003). Lack of sophisticated information technology systems has been identified as an impediment to successful CSR reporting (Eccles et al., 2014), but the software industry is a very fast-evolving one and the newest CSR-reporting applications are relatively sophisticated. Further below we suggest that it is not lack of IT systems, but lack of electronic integration of the CSR-reporting system with other enterprise systems that is a source of frustration with the information technology used by those in the sustainability function.

Figure 1 below illustrates the front office and back office components of CSR reporting and stakeholder engagement as they are mediated by the artifact of the CSR-reporting database and reporting system, with the top double-sided arrow indicating a two-way flow of information providing feedback mechanisms between the two realms – front offices to back-offices and forward again – that are necessary to move engagement from a legitimacy function at the front edge of the firm deeper into the organization in the form of routinized learning. By making CSR data and information readily available, this artifact can increase the speed and accuracy of the organization’s stakeholder responsiveness. And as a boundary object, it can make tacit learnings explicit and overcome inter-functional conflict to support the routinization of new learnings that emerge from the practices of sensing and responding to stakeholders.

Propositions

The propositions developed below are in three categories. The first of these addresses how the CSR-reporting IT artifact can most effectively support stakeholder engagement by increasing the delivery speed, accuracy, and timeliness of responses to stakeholder requests for information. The second category elaborates on the cross-functional nature of the design processes needed to routinize ongoing information-based communication interactions with stakeholders. The third category identifies problems that could result if the different functional units working together to design these routinized processes conflict in their vision of how transparent the organization ought to be. Taken together, these proposals offer many avenues for future research on ways that organizations might more effectively respond to their stakeholders’ information needs, both now and in the future.

Electronic Integration of the IT Artifact with Enterprise Systems

Enterprise systems are large-scale application software packages that are used by organizations to run their operations. It is a challenge for large firms to operate without one or more. The enterprise Resource Planning (ERP) software application integrates all of the major organizational functions that comprise the enterprise, and even many that are external to it as well, such as customer and supplier support. ERP supports “the enterprise needs of an organization by tightly integrating the various functions of an organization using a process view” (Sadagopan 2003, p. 169). In addition to providing the software to perform each function (e.g. accounting, purchasing, manufacturing, etc.), these systems support information flows between the functions via a single integrated database, which also enables reporting and data analytics. Enterprise systems enable a high degree of internal integration that allows internal organizational units to work in tandem and to be responsive to each other (Barki and Pinsonneault, 2005). Such electronic integration can enhance a firm’s agility (Nazir and Pinsonneault, 2012) by spanning subunit and organizational boundaries (Swafford, Ghosh and Murthy, 2006). However, specialized and newly-developed software applications are often not electronically integrated into an organization’s enterprise system, so the data they produce is not available in the central enterprise database, nor are they able to electronically retrieve data from the central database. Two types of systems that are typically not integrated into enterprise systems are Environmental Management Systems that collect resource usage and emissions data, and CSR-reporting software application.

Most CSR-reporting software systems are not designed to be electronically integrated with the enterprise system or other systems that provide the data it needs for reporting. Rather, internal data is gathered from around the firm and entered by hand or through manually-controlled downloading and
Figure 1. Practices utilizing the boundary-spanning IT Artifact

Back-office Practices
- Existing internal databases:
  - Production Systems
  - Human Resource Systems
  - Compliance Systems
  - Energy Mgt Systems
  - Project Mgt Systems
  - Suppliers

IT Support & Integration
- Ongoing practices of data & info collection and entry by Sustainability experts

Information Feedback & design for continuous improvement

Front-office Practices
- Corporate Website
- Standard CSR Reports
- Responses to CSR Info requests
- Stakeholder Communication:
  - Shareholders
  - Customers
  - Community
  - Environment
  - Regulators
  - Employees
  - Press
  - Social Media

The CSR Reporting Software Database
- Ongoing practices of Information Disclosure by Marketing/PR experts
uploading of spreadsheets. This is because different systems from different vendors have different data standards and periodicity, such that integration requires customization that is complex and expensive. This is not to say that they cannot be electronically integrated with the databases that provide their source data; there are various technical options for securing such integration, of various degrees of expense and complexity.

But to the extent that they are not electronically integrated, they are not able to realize several of the advantages of enterprise systems related to agility, such as being able to respond rapidly to the information needs of stakeholders (Barki and Pinsonneault, 2005). Where agility requires inter-functional coordination, as it does in this context, internal systems integration can achieve this to positively impact a firm’s responsive capability (Roberts and Grover, 2012). Automated information flows allow firms to quickly gain knowledge from their environments, and to pro-actively respond to these changes. Thus electronic data integration between back-end source systems and the CSR-reporting artifact can enhance agility by increasing the speed by which data can be collected and delivered:

P1. **Electronic integration between source-data systems and the CSR-reporting IT artifact supports stakeholder responsiveness by increasing the speed of data access and delivery.**

Such electronic back-end data integration also supports increased data quality, because data that is untouched by human hands is less prone to errors (Srinivasan, Kekre, and Mukhopadhyay, 1994) and hence more accurate. Also, by speeding data delivery, electronic data integration increases the likelihood that the data and the information derived from it will be timely (i.e. not be out of date). It also lowers the cost of data collection, since automation reduces labor costs.

P2. **Electronic integration between source-data systems and the CSR-reporting IT artifact supports stakeholder responsiveness by increasing data accuracy and timeliness.**

However, not all the data and information required to produce a CSR report is amenable to back-end electronic integration. In the current (G4) reporting standard, 72 of the 91 indicators have at least some quantitative component. And given the expense of electronic integration, it makes no sense to attempt to electronically integrate indicators that are primarily qualitative. Further, the periodicity and granularity of the data required for GRI reporting varies. Highly granular, detailed data points are generally aggregated during the integration process, enabling innovation by harnessing rather than reducing complexity (Brown and Eisenhardt, 1997; Van de Ven et al., 1999). Integration makes sense for these data points, and for those that are frequently updated, having high periodicity. Quantitative data points that change infrequently can be inexpensively updated manually, although this can introduce errors. And data for which there is no existing source-data information technology in place cannot be electronically integrated. Thus part of the practice of populating the CSR software artifact is one of prioritizing what can and should be electronically integrated with back-end systems. Where such a practice is in place, propositions 1 and 2 above will be most salient.

P3. **Efforts to electronically integrate the CSR-reporting IT artifact should prioritize data that is available in existing IT systems, is highly granular, and changes frequently.**

The IT function is responsible for doing this appropriate data integration, and also plays an important role in ensuring the accuracy, timeliness and security of the data as it moves between source-data systems and the CSR-reporting system. Therefore the IT function can increase stakeholder responsiveness by enabling back-end, appropriate, electronic data integration.

P4. **Attempts to increase stakeholder responsiveness without the involvement of the IT function are less likely to succeed than those that do involve the IT function.**

**Inter-departmental Relations in this Context**

The CSR-reporting IT artifact consists of functionality for data entry and reporting, and a database of organization-specific content reflecting ongoing data collection efforts. This database is a repository of data and information – both current and historical trends – that may be sought by stakeholders and/or
are helpful for engaging them. This repository can be utilized both by those actors trained in sustainability reporting and by those in the PR department to communicate with stakeholders. In this way the practice of CSR reporting and the practice of stakeholder engagement come together as they utilize this shared boundary object for stakeholder responsiveness. Just as customer responsiveness requires inter-functional coordination (Roberts and Grover, 2012), so too does stakeholder responsiveness, specifically between the CSR (or sustainability) department and the PR department.

Because of the labor intensiveness of the initial set-up, companies tend to set up their CSR reporting processes so that they will be repeated annually, since this is the expectation of the socially responsible investment community, and because once the set-up is complete, it is relatively straight forward to produce CSR reports annually. At the same time, companies are expected to increase their transparency over time: to move from a C-level application (the lowest) to an A or A+ application level over time. To move up application levels requires ongoing modification of the design of the report to be produced and its associated data collection processes. The CSR-reporting IT artifact is a boundary object, with one boundary at its input side and another at its output side. At the input side of the CSR reporting system, two design practices must therefore occur. First, the initial data collection and entry processes need to be designed, along with specification of the processes for ongoing collection and entry of this set of data. This design practice encompasses what needs to be collected, where it is to be collected from (e.g. which systems, internal and or external, or processes), and how it is to be collected, for example via electronic integration or a specified process of manual loading. It also needs to specify how often this data is to be updated, with controls to ensure its quality and timeliness. This design process takes place after senior management and risk management officers have done an assessment of the materiality of the risks posed by each of the six GRI aspects, for the particular industry sector. It necessarily involves the sustainability officer, since the result of this process will determine the content of the CSR report subsequently produced, and therefore affect the GRI application level attained, and ultimately, analysts' sustainability ratings of the firm.

In addition to this initial design process, a second, meta-design activity is needed which specifies how the initial design will be modified, and how often, so that the content of the repository can evolve over time and the firm can move to higher application levels. Such ongoing modification enables routinization of emergent information needs and ensures that historical data needed in the future will be collected today. It also supports the future information needs of the PR department, information needs made apparent during current sense-and-respond stakeholder engagements. This is important because those in the PR department engage with stakeholders on an ongoing basis, and so are well positioned to learn of current and future information needs that those in the sustainability function might not be aware of. In this way, those in the PR function pay a critical role in designing for future information needs. By ensuring that representatives of the PR department are involved in these design practices, the company can exploit new learnings regarding future stakeholders' information needs: information to meet future stakeholder needs will then be readily available and accurate. Thus inclusion of those in the PR department into the design evolution of CSR data collection and entry practices can extend stakeholder responsiveness:

P5. Attempts to increase stakeholder responsiveness without the involvement of the PR function are less likely to succeed than those that do involve this function.

Two similar practices also reside at the output side of the CSR boundary object. The first of these is the ongoing provision of information to stakeholders in active engagement. The second is the meta-design of ideal future stakeholder engagement practices based on data and information that will be available in the CSR repository in the future if the organization begins to collect it now. At the input side, these two practices are generally under the purview of the sustainability department, while at the output side, the two practices are generally the responsibility of the PR department. The boundary object mediates the interactions of these two functions as they negotiate during the design of the back-end, input-side practices necessary for routinizing new learnings from stakeholder interactions. The CSR-reporting IT artifact makes tacit knowledge explicit in this process of negotiation. By demanding both design and meta-design practices at both the input side of the repository and at the output side, the artifact supports organizational learning and consequent responsiveness.
P6: The sustainability and PR functions should work together to share the boundary object and design it for optimizing the future information needs of both functions.

The Impact of Shared Vision

Thus stakeholder responsiveness requires ongoing design negotiations among those in the sustainability function and those in the PR department. Certainly senior management and risk compliance officers need to be involved in these negotiations at a high level, and we have made the case above that the IT department should also participate. This is a more nuanced view of CSR reporting as the prerogative of marketing (Nikolaeva and Bicho, 2011; Sweeney and Coughlan, 2008), since it underscores the need for mutual, inter-functional design practices around the shared boundary object.

When organizational subunits lack a shared vision, conflicts may occur when they are tasked with designing organizational practices and policies (Tjosvold, Dan and Wong, 1992) such as those described above. In particular, those in the sustainability department may not share their vision of how transparent the company ought to be with those in the PR department: while some PR departments may see the need for high transparency, following prescriptions to address tough issues head on and without greenwashing (Ilia, Zyglidopoulos, Romenti, Rodriguez-canovas and Gonzalez del Valle Brena, 2013), this is a new prescription for the public relations function. More traditionally, and according to Agency Theory (Eisenhardt, 1989), executives have incentive to withhold information from shareholders, and managers from employees, since this enables rent extraction and is a source of financial gain. Information obfuscation can raise profits by making customers less informed (Ellison and Ellison, 2009). Increasingly, those in marketing and public relations are being called to task for presenting promotional information in the guise of independent, unbiased news and information (e.g. Stauber and Rampton, 2002). And certainly there is a legitimate need for firms to protect their intellectual capital. Meanwhile, those in the sustainability function may be concerned about corporate externalities that harm the environment and society, and to the extent that CSR reporting can minimize these, they are likely to believe that more CSR disclosure is better than less. Their knowledge of the socially responsible investment industry may also make them more likely to be aware that companies are being rewarded by the financial markets for being transparent as well as for being socially responsible. For these reasons, the sustainability subunit and the PR subunit may not share their visions of appropriate organizational transparency, making it challenging for them to collaborate effectively during design of practices that release organizational information to the public. In sum:

P7. Lack of shared vision – between the sustainability subunit and the PR subunit – around appropriate levels of organizational transparency may sub-optimize the organization’s stakeholder responsiveness.

To the extent that the sustainability department’s vision is such that more transparency is better, and that of the PR department embraces the need for caution around transparency, the following dysfunction may become apparent:

P8. If design practices are dominated by the sustainability subunit, there may be a lack of feedback information from the PR department that can impair the capability for routinizing future stakeholder information needs into the CSR-reporting boundary object.

At the same time, if these practices are dominated by the PR department, less information may be disclosed on CSR reports to the detriment of the organization’s sustainability ratings, ratings that may affect their cost of capital (Dhaliwal et al., 2011; El Ghoul et al, 2011)):

P9. If design practices are dominated by the PR subunit, there may be a lower likelihood of achieving high sustainability ratings due to lower levels of information disclosure.

Finally, we posited above that appropriate back-end electronic integration between the source-data systems and the CSR-reporting IT artifact will increase stakeholder responsiveness by speeding the data update and delivery process, and by increasing its accuracy and timeliness. However, removing the human hand from the process of populating the CSR-reporting artifact also removes the option for
information gatekeeping at the input side, which may present a threat to those units that are concerned about too much organizational transparency. This reflects the tension in the paradox between the positive effects of back-end electronic data integration, and the lack of human control that it represents:

**P10. If design practices are dominated by the PR subunit, there may be a lower likelihood of efforts to electronically integrate source-data systems with the CSR-reporting IT artifact.**

Further, the benefits of electronic integration come with the additional need to negotiate with those in the IT subunit. If the IT subunit shares the transparency vision of either the sustainability function or the PR function but not both, coalitions may form and have negative consequences for the negotiations necessary for doing the integration work necessary for enhancing ongoing stakeholder responsiveness.

**Conclusion**

CSR reporting is now a standard practice in the vast majority of large corporations. Sustainability analysts use the content of these reports, audited or not, to produce the sustainability ratings that socially responsible investment firms use to decide whether to include a firm in their product offerings. In this way firms with low sustainability ratings are increasingly paying a higher cost of capital. At the same time, stakeholder engagement practices engender either positive or negative views of the firm that, when made public, also serve as input to the reports and ratings produced by sustainability analysts. Thus it behooves the firm to optimize both its CSR reporting processes and its stakeholder engagement practices. This paper has elucidated the role of the CSR-reporting IT artifact in doing so, and ways that back-end electronic integration of this artifact can optimize both CSR reporting and stakeholder engagement. The CSR standards organizations have designed their platform to reward continuous improvement, such that reporting firms are incentivized to refine the design of their CSR repositories and associated reports in a process that is informed by stakeholder engagement. The IT function plays a crucial role in supporting this design process and embedding the new learnings that emerge from continuous engagement with stakeholders into the IT artifact.

This paper has sought to inform IT researchers and practitioners of the importance of this new IT artifact, the emergent organizational practices that occupy its boundaries, and the important role that those in the IT can play in optimizing them. It develops ten theoretical propositions that illustrate future research directions. We look forward to validating these propositions empirically, and invite interested researchers to do the same.

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