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What's on the Business Horizon for Environmental Performance?

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Abstract
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What's on the Business Horizon for Environmental Performance?

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Global environmental regulations specific to the production and disposal of electronics present a host of information challenges to manufacturers, distributors, original equipment manufacturers (OEMs), and more specifically to management systems. Within the last year, companies such as Intel have developed country specific recycling and producer responsibility information systems for Germany, Austria, Norway, and Switzerland.

Others such as Lucent Technologies have corporate reports highlighting the management systems in place to accommodate electronic take-back programs since 2004 and are now still trying to figure out how to close the supply chain loop in the EU. So what is this all about and how do management systems bare the burden of more product regulation?

Management systems facilitate the cooperation and mobilization of resources, and the coordination of effort that facilitates the joint survival of an organization and its members. These contributions to survival are accomplished through measurement and the control of information. While all organizations process and channel information through established and continuously evolving systems, some organizations are better at creating standard practices for appropriate behaviors that help to measure, manage, and hold people accountable for their actions. The central themes of performance management systems are decision making and the flow of information within organizations that instructs, informs, and supports decision making processes. But how do companies create and integrate sound measurement systems within ever-changing competitive environments, and how do some firms create successful systems for measuring and managing performance?

Improved environmental performance is increasingly important, yet simultaneously difficult to research since access to internal systems and data is hard to obtain. Managers are aware of the potential offered by improved environmental operations but have difficulty trying to create solutions to new problems, such as the supply chain implications of two recent European Market directives. The first, Waste from Electrical and Electronic Equipment (WEEE), mandates the treatment, recovery and recycling of electric and electronic equipment. The second, the Reduction of Hazardous Substances (RoHS) restricts the use of hazardous materials found in electrical and electronic products. Both WEEE and RoHS impact all applicable products in the EU market after August 2006. After this time, the products need to be compliant and carry compliance documentation and symbols.

Additional, ongoing Sarbanes Oxley initiatives (SOX) will push the corporate world to move from the auditing and process documentation work into rigorous and real-time measurement and management of control points. So how do managers cope with all of these external pressures to reexamine performance measurement and who is pushing for these changes?

Stakeholders such as corporate investors, creditors, customers, regulators, and environmental interest groups are interested in corporate performance since the level of waste produced by the firm affects these groups either directly or indirectly. Researchers interested in the growing field of environmental performance find theory development and the ability to explain or predict phenomena is difficult given the lack of comparable data. As this interest in environmental performance increases,

there is a commensurate increase in the need for performance measurement as delivered by performance measurement systems. The functions provided by performance evaluation include not only measurement, but also clarification and direction, and identification of opportunities for improvement.

The need for improved environmental performance and the accompanying measurement introduces its own set of issues. The first is that these metrics must meet the needs of several diverse groups. The metrics created by governmental regulations become drivers for business managers, which in turn become drivers for shop floor personnel. Metrics will have different implications for stakeholders at all levels of the firm, both internally and externally. Second, there is the issue of how to introduce new metrics into the existing measurement system. If the addition of these metrics makes the resulting set of metrics too large, then the result may be confusion, frustration, and a movement towards doing only enough to meet the minimum requirements of an ever expanding performance dashboard.

Our intentions are to highlight some of the current issues managers face regarding performance measurement and management, discuss a research project we conducted, and suggest future areas of research. For the sake of what we are talking about here, an Environmental Management System (EMS) involves "The formal system and database which integrates procedures and processes for the training of personnel, monitoring, summarizing, and reporting of specialized environmental performance information to internal and external stakeholders of the firm" (Sroufe, 2003). The basis for the information presented here comes from our direct contact with industry managers during several field research projects. We have found several differences in the perceptions of environmental metrics and the barriers facing management when attempting to create change through the introduction of new performance metrics.

Financial and/versus Nonfinancial Measures

Environmental or other nonfinancial measures can play an important role in measurement systems. The potential value of nonfinancial measures for predicting and interpreting financial performance prompted the Financial Accounting Standards Board to consider the disclosure of these measures to investors in financial statements over six years ago (FASB, 2000). This argument was recently reiterated by the CEOs of the world's largest accounting firms (DiPiazza, Rake, McDonnell, Samyn, Parrett, & Turley, 2006). Basically, nonfinancial environmental metrics can help auditors understand the risks of the client and make an audit less likely to run the risk of litigation in case of a client's failure due to mismanagement. Just how environmental metrics can reduce risk or how they are linked to firm performance is not always clear due to a dearth of information regarding frameworks or models for these metrics and a lack of agreed upon standards as to how to report environmental information in corporate environmental reports.

Research has shown that environmental performance and firm performance are positively linked while some research has shown that as an industry grows, environmental performance will have a greater positive impact on firm profitability (Klassen & McLaughlin, 1996; Konar & Cohen, 2001; Pagell, Yang, Krumwiede & Sheu, 2004). Additionally, improved manufacturing performance can occur simultaneously with investments in technology that improve environmental performance (Klassen & Whybark, 1999). What has not been researched to date are the actual environmental metrics that facilitate environmental initiatives, how firms integrate metrics, who uses the metrics, and how this information is reported internally and externally. With the impact of new international environmental initiatives such as WEEE-RoHS, the business horizon for many manufacturing firms includes questions as to how these new initiatives should be measured and managed.

Who Have We Been Talking to?

In order to gain a greater understanding of the issues involved with attempting to implement environmental metrics, we hit the road to interview a number of firms. The Kinder, Lyndenberg and Domini social performance rankings were used to help identify potential firms. (Complete information about these ratings can be found at http://www.kld.com/research/index.html.) The list was sorted by environmental performance and overall social performance. The firms on this list were then contacted by the research team with the objective of visiting 10 of the firms. We were able to visit with 10 of the top 90 ranked firms. Over the course of a day-long visit, multiple people from a variety of functions were to be interviewed individually by two researchers along with a tour of the facilities. A variety of functions was desired so that the researchers could get as complete a picture as possible of the firm's environmental metrics system and so that the researchers could explore how extensively each function participated in the system.

What We Found

One interesting result of these interviews was the feedback obtained on the research project itself. Many of the managers said they found the interviews to be an occasion for them to re-think some of the things they were doing with their environmental metrics system. In fact, one interviewee got up in the middle of the interview to contact a co-worker about an idea that was brought up. At the end of the visit with this firm, the research team was informed that the new idea (a new measure) had been implemented and reported externally in the future.

Throughout all the firms, the interest and attention top-level management gave to the environmental metrics system had a clear effect on how successful this system was. With WEEE-RoHS on the horizon (at the time of the field studies), top management's attention increased as the compliance date for these initiatives grew closer. This was especially more

true of firms in technology industries. The perceptions of top management varied for a variety of reasons. Primary among these was not only timing, but the level of environmental impact the firm had which was inherent in its business.

One opportunity to better understand and explain differences in performance can come from how well everyone within a firm understands the metrics system and related procedures. More than a few interviewees indicated something to the effect that "nobody likes to hear from the environmental people, because that meant problems." This was especially notable in the new product development process. Based on these interviews, a key to a successful environmental metrics system appears to be fully integrating it into the firm's business processes, so that it is not seen as a "roadblock." For example, one firm's environmental, health and safety (EH&S) function took every measure to ensure that their systems and metrics were not considered a hindrance to any existing processes and made sure to always make a strong business case for any changes to existing environmental procedures.

In discussing the gap in perception that existed between upper and lower levels of management, we found that different levels of management need or desire different levels of granularity in the metrics they use. This is not surprising. What seemed frustrating to the people we interviewed, however, was that this could cause conflicting views of what were essentially the same measures. To overcome this gap, many firms spoke of the concepts of communication and "alignment," though in yet another paradox, alignment was often defined differently by the interviewees. The idea they were trying to get across was to have everybody working toward the same goals by making sure the measurements and related rewards were designed properly.

Evolution versus Revolution

Like other initiatives, successfully implementing environmental metrics involves a rather large commitment by management. Successful systems collect and disseminate environmental data internally and externally with the expectation that external reporting will continually grow in demand. The expected growth in reporting by the managers we talk to parallel the findings of KPMG's 2005 survey of International Corporate Responsibility Reporting, which also claims that corporate environmental reporting will do nothing but increase in the future (KPMG, 2005). With the onset of WEEE-RoHS, some firms may be pushed more quickly up the evolutionary learning curve, and it may feel like a measurement revolution is taking place. What this may in fact be is another difference between innovative firms and laggards. Environmental performance measurement in innovative firms can be normalized to units of product, cost, or quality/waste, while other firms not wanting to cross the environmental metric chasm have embedded environmental metrics that typically do no more than react to problems and help maintain compliance. Thus, new performance indicators for new environmental metrics will need to be determined, tracked, and reported.

Too often, key performance indicators (KPI) have yet to address environmental metrics or how these metrics can be normalized and related to existing KPIs. Many firms are already using enterprise resource planning (ERP) systems and these large integrated systems are a logical place to house new metrics and disseminate information. Through the extended use of an ERP system, we find an already cross functional, integrated system that can be adapted to the use of environmental metrics. For firms and managers to successfully integrate environmental measurement, it is likely that ERP systems will have to evolve to the point of revolution, a point in which the systems "extend the horizon of analysis" as discussed by Corbett and Klassen (2006).

Opportunities For Further Research

An understanding of facility-wide and company-wide environmental measurement and management appears to be a relatively undeveloped capability for some of the firms we have been working with. All firms have environmental philosophies, measurement, or practices; some are just more explicit about theirs. For those firms that have well-developed environmental management systems in place, we find they have better performance measurement and management while engaging EH&S personnel. This is not typical of all firms, as compliance with environmental regulations typically falls on the shoulders of the often tactically or strategically neglected EH&S department. The people within this department are often very knowledgeable employees that often communicate with Environmental Protection Agency (EPA) or Occupational Safety and Health Administration (OSHA) and managers from other functions within the firm. These EH&S employees may have little power within the organization and lack top level visibility. This lack of top level visibility is more apparent when the responsibility for environmental compliance, environmental championing or an environmental project falls upon only a few individuals. Thus, these people do not know what is going on at the top of the organization at a strategic level. Conversely, top management doesn't know much about what its EH&S department is doing or how this function can contribute to the tactical or strategic levels of the firm.

After reviewing field visits to firms in very different industries we found an understanding of environmental opportunities and metrics within the EH&S department, but that this understanding could be vastly different between upper management even within and especially outside of the environmental function. Thus, the people at the top either couldn't see, or didn't understand the details of their environmental processes and that managers and process level workers only saw their own individual level metrics of any given process. The successful fulfillment of EH&S responsibilities requires a complex mix of overlapping functional responsibilities. A lack of horizontal and vertical understanding can lead to a lack of responsibility in firms that do not have effective performance systems in place. This issue of how to achieve metrics alignment needs further exploration.

Within organizations that have good measurement systems in place, the EH&S personnel have become an integrated part of new product development processes and make sure their involvement in development or production processes do not interrupt operations and production. In those firms that have a formal system in place with management support, communication, and monitoring, there may be an environmental network effect that integrates functions and facilitates product and process improvement. In these firms, compliance is a minimum starting point and the contributions of EH&S personnel can be more closely tied to total quality management and are part of improvement initiatives that have tried to align organizational systems such as ERP implementation teams.

The perception of the costs and benefits of environmental issues may be changing. Certainly, there are some firms who view punishment for non-compliance of environmental regulations as a cost of doing business. Other firms view minimum compliance as an order qualifier. The firms in our study appeared to see a link between proactive environmental polices and competitive advantage. In other words, they saw this proactive stance as an order winner. These firms were actively seeking to integrate environmental measures into their firm's dashboard.

A key issue is the lack of standardization of measures and reporting. A natural comparison is to accounting and financial measures, many of which are defined by FASB and the SEC, respectively. This makes research using traditional financial measures relatively easy as there are standard definitions and also years of data are available. The situation is much different for environmental measures. Many of the firms we interviewed appeared to be forging ahead with their own measures and definitions. This often leads to comparability problems from division to division for managers and by extension, firm to firm comparability problems for researchers. For researchers, these comparability problems become worse when considering across firm and across industry comparisons. Though there are currently many environmental reporting initiatives for standards (e.g., Measuring the Environmental Performance of Industry, Global Reporting Initiative, and the Global Environmental Management Initiative) until agreement on measures is achieved, it appears researchers will have to overcome measurement challenges for the foreseeable future.

Future research should include examining environmental versus non-environmental metrics, and the extent to which are these metrics reported and disseminated. Other directions for future research include, but are not limited to the following.

- A need for more field based studies to build theory regarding the impacts of WEEE and RoHS.
- The use of corporate reports for data collection and analysis.
- A comparison of the different environmental reporting standards and their relative efficacies.
- Empirical research testing new relationships between environmental metrics and other non-environmental performance metrics
- Modeling of supply chain performance measurement systems that include environmental metrics.
- ERP systems' effect on performance measurement?
- Measurement of corporate culture based on the depth and breadth of metric penetration within a firm or supply chain.
- Development of a repository of performance metrics from across industries to be able to contrast and compare metrics at different levels of the firm or across industries.

Some managers and firms we have been interviewing are leading the way in the disclosure of environmental information with the objective of being first movers and possibly setting standards for what will be done in the future across industries. According to the managers solicited in this study, the number of firms creating corporate environmental reports is increasing and will continue to do so into the future especially with directives such as WEEE – RoHS impacting manufacturing firms. As demands for environmental performance information keep increasing, it is likely that this will be an important area of research for many years.

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