International Journal of Corporate Sustainability

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Management Systems Approach
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Developing a Management Systems Approach to Sustainability at BMW Group (Part 1 of 2 Parts)

Michael W. Toffel, Natalie Hill, and Kellie A. McElhaney

This article describes how Designworks/USA, a subsidiary of BMW Group, developed a Sustainability Management System (SMS) by integrating the management of environmental, social, and traditional business issues. After several months of deploying the SMS throughout its business operations, this industrial design company became the first organization in the world to achieve third-party certification of a SMS. An article in the next issue of *CES Journal* will describe the preliminary outcomes of the SMS and challenges Designworks/USA faces in its ongoing SMS development efforts. In addition, that article will describe how the SMS is facilitating BMW Group's commitment to implement the United Nations Global Compact's human rights, labor, and environmental principles.

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Introduction

Situated in Southern California amongst more than 20 design studios operated by major automobile companies, Designworks/USA provides design and engineering services. Founded in 1972 as an independent design company, the firm developed expertise in designing vehicles—including automobiles,

long haul trucks, railroad passenger cars, and construction equipment—as well as a wide array of consumer products such as cellular telephones, camera bodies, personal computer frames, ski goggles, and sunglasses. In addition, the company creates graphic designs for products ranging from vehicles to snowboards. Its clients have included Atomic, BMW Group, Compaq, Heidelberg, John Deere, Gulfstream Haworth, Microsoft, Motorola, Nokia, Siemens AG, and Vivitar.

of automobiles. Approximately half of the firm's design work is for third-party clients. Designworks/USA employs 80 people across its four design departments (Automobile Design, Product Design, Transportation Design, and Advanced Communications Design or AdCom), Engineering, Human Resources, Operations, Finance/Administration, and Marketing/Sales. In addition, the firm bolsters its design department with nearly 20 contractors. The $15 million firm operates in a 77,000 square-foot facility an hour north of Los Angeles. In 1998, the firm opened a satellite office in Munich to facilitate communication with BMW Group and other European clients.

Table 1: The Designworks/USA creative process

Element	Objectives	Main players
1. Define	Define the client's needs and expectations, determine the project scope and primary participants.	Design Client
2. Understand	Investigate the possible user profiles and the current market situation in terms of brand identity, product positioning, distribution, and retailing. Based on these findings, identify opportunities and strategies for concept exploration.	Design Engineering
3. Explore	Idea generation and visualization.	Design Engineering
4. Refine	Benchmark the various concepts against the original program criteria to prioritize design ideas. Resolve design concept, complete preliminary engineering and prototyping. Liaise with material suppliers and manufacturers.	Design Engineering
5. Implement	Transfer the design idea to the manufacturing process.	Design Engineering Client Third-parties

Designworks/USA began working with Munich-based BMW AG (which later became BMW Group) in 1985, when it was asked to design the seats for the BMW 8-series. The relationship grew and eventually BMW Group acquired 51% of the company in 1991 and the remaining share in 1995. Now a wholly-owned subsidiary of BMW Group, Designworks/USA continues to serve many other clients, which enables designers to leverage their experience with BMW Group to other types of products and allows BMW Group to learn from design projects beyond the domain

Designworks/USA has developed a standard workflow process to manage client engagements. Table 1 describes the objectives and main participants of each workflow element.

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Vol. 10, Issue 2 (February 2003) ISSN 1066-7938

Sustainability Management: From BMW Group to Designworks/USA

BMW Group has long displayed a commitment to improving the environmental profile of their products. In the early 1970s, BMW Group introduced the first electric powered car, was the first car manufacturer to appoint an environmental officer, and worked with other companies to establish a hazardous waste disposal system. In the late 1970s, BMW Group introduced the first hydrogen powered car. By the late 1980s and early 1990s, BMW Group was using water-soluble paint technology, focusing on issues of disassembly and recycling of end-of-life vehicles, and extending its management principles to include environmental guidelines. From the mid-1990s to the present, BMW Group began using low-emission, water-borne paint technology and powder clear coat, produced a natural gas powered series-production car and a small production series hydrogen powered car, committed itself to sustainable environmental protection, and is currently focused on clean production, clean energy, and lightweight engineering.

In 1999, BMW Group achieved a major milestone by implementing environmental management systems (EMS), which allow the company to identify and manage environmental risks and impacts, in all of its manufacturing facilities. Each of these facilities was certified to the International Organization for Standardization (ISO) 14001:1996 Environmental Management System standard, and some were also verified to be in compliance with the Eco-Management and Audit Scheme (EMAS). This completed a process begun in 1995 in Germany and Austria, and subsequently extended to all BMW Group production facilities worldwide. Indeed, BMW Group was the first automobile manufacturer to have an EMS in place at every one of its production plants. With this achievement, the BMW Group turned its attention to improving the environmental performance of its business partners and its non-production facilities.

Looking externally, the BMW Group began encouraging BMW dealerships in Munich and South Africa to be certified to ISO 14001. Internally, BMW Group was interested in deriving more value from their EMS efforts in a manner consistent with the company's commitment to continuous improvement. In addition, BMW Group sought to promote the concept of sustainable development within their organization. With over a decade of experience implementing EMS at their production facilities, BMW Group's environmental management team developed a clear understanding of benefits and limitations to the EMS process. Accordingly, discussions amongst BMW Group's Environmental Management Systems Representative Suzanne Dickerson and two representatives of WSP Environmental, Ed Quevedo and Andrea Sumits, at the 1999 Munich US/European EMS Workshop led to the idea of developing a Sustainability Management System (SMS). WSP Environmental North America, part of WSP Group plc, provides sustainability, environmental, and geotechnical consultancy services to corporate and public agency clients throughout North America, Europe, and across the Pacific Rim. BMW Group had worked with WSP to implement EMS at several of its production facilities. A series of discussions ensued at BMW Group's Munich headquarters to select a pilot site.

Several factors led to the selection of Designworks/USA. First, it was acknowledged that design is a high leverage point over many sustainability issues. Designers are uniquely positioned to investigate and offer design alternatives that can influence the environmental, social, or economic impacts of products. Second, designers can bring a high level of creativity to developing and implementing an SMS. Accordingly, Dickerson and BMW Group's Director of Environmental Protection Manfred Heller approached Chris Bangle, Chief of BMW Group Design, to suggest that

one of BMW Group's design facilities serve as the pilot test site. Bangle agreed and approached Designworks/USA because it was unique among BMW Group's design facilities as it serves a wide range of industries and clients in addition to BMW Group. This was an advantage because the length of time to design many of the consumer products that Designworks/USA designs is significantly shorter than the length of time it takes to design an automobile, allowing for a more rapid assessment of the success of the SMS. At this point Designwork/USA had no comprehensive approach to identifying and managing its environmental and social aspects. The company's experience would answer three key questions for BMW Group: (1) Can the EMS concept be extended into an SMS? (2) Can an SMS be made relevant and useful to a design consultancy? (3) To what extent can an SMS be adapted to suit BMW Group's other facilities and business operations around the world?

Developing an SMS Framework

Designworks/USA agreed to facilitate the pilot. Designworks/USA could readily see the advantages in a system that allowed them to manage their environmental impacts and was intrigued, as a small firm with a 'family feel', by the opportunity to deal more systematically with its employees. In addition, as a profit center, Designworks/USA was very interested in a system that allowed better management of their financial aspects. Anticipating that significant modifications would be required to accommodate the many differences between its aspects and impacts and those of an automobile production facility, BMW Group lent Dickerson to the initiative and sponsored the involvement of WSP Environmental.

The SMS initiative was initially led by a team comprised of Dickerson, Designworks/USA's Director of Finance Arnd Wehner, and WSP's Quevedo. The first task was to develop a framework to ensure that environmental, economic, and social concerns would be incorporated throughout the organization's decision-making processes. While no international standard for such a system existed, the team recognized the value in creating a framework akin to ISO 14001. Dickerson and WSP's Quevedo and Andrea Sumits took the lead in drafting *A Sustainability Management System Guidance*, which would become the standard against which the organization's management system would be audited. As such, this document is referred to in this article as the "SMS standard." In part, it calls for Designworks/USA to implement the following elements:

- Create a sustainability policy;
- Identify and prioritize SMS aspects and impacts;
- Establish objectives and targets;
- Develop programs to achieve objectives and targets;
- Evaluate progress via periodic internal audits and management reviews.

The SMS standard addresses the broader sustainability issues in a similar way that the ISO 14001 EMS standard deals with environmental issues. The SMS standard is based on the structure of ISO 14001, includes the same major elements, and uses common terminology and definitions (e.g., environmental aspects and environmental impacts). In addition, both standards afford the organization wide latitude to develop its own impact prioritization scheme.

Functionally, the SMS standard requires that roles and responsibilities for improving sustainability performance be defined, and that a host of documented procedures be developed and controlled. The SMS standard requires the organization to develop procedures to:

- Identify and prioritize sustainability aspects and impacts;

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- Identify legal requirements related to sustainability concepts and to evaluate compliance;
- Develop sustainability objectives and targets within each organizational function;
- Identify and deploy education and training to ensure awareness and competence;
- Regularly interact with stakeholders including regulators and the public;
- Routinely audit the organization's management system against the requirements stipulated in the SMS standard;
- Ensure that top management periodically reviews the SMS.

While the SMS standard was built on the ISO 14001 framework to facilitate certification to both standards, it contains many unique elements, particularly with regard to integrating social issues into the management system process. The SMS standard incorporates two leading conceptualizations of sustainability. First, it incorporates the "triple bottom line" concept by requiring management decision-making to incorporate economic, environmental, and social impacts.[1] The Global Reporting Initiative's 2002 Sustainability Reporting Guidelines [Editor's note: see interview with Ernst Ligteringen, Chief Executive of the Global Reporting Initiative, on page 3-1.] promotes this approach, and many multinational companies have adopted it. Second, the SMS standard employs perhaps the most widely used definition of sustainable development, "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." [2] Accordingly, the SMS standard defines sustainability as "a state of balance among the environment, society, and economy, achieved by creating a sense of shared organizational and personal responsibility for all future environmental, economic, and social impacts of the organization, which become the basis for actions calculated to meet the needs of the organization without compromising the future ability of others to meet their needs." The "balance" called for in this definition is left to Designworks/USA to define.

The SMS standard extends beyond ISO 14001's environmental scope by also including social and economic aspects into the management system. The SMS standard defines a social aspect as "elements of an organization's activities, products, or services that can interact with society" and a social impact as "any change to the society, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services." Economic aspects and economic impacts are defined in a parallel manner. The SMS standard also broadly defines an interested party as an "individual or group that is or may be concerned with or affected by the sustainability performance of an organization."

Even within the environmental domain, the SMS standard departs from ISO 14001 in several substantial ways. For example, while the only performance level stipulated by ISO 14001 is that an organization's environmental policy must include commitments to comply with all relevant environmental laws and to continuous improvement, the SMS standard includes "an expectation of progress in the management and consequent reduction of impacts or risks from the environmental, economic, and social impacts of the organization's business operations."

Initial SMS deployment

Implementation of the Designworks/USA SMS began in January 2001. To begin devel-

[1] John Elkington, Cannibals with Forks: The Triple Bottom Line of 21st Century Business, New Society Publishers, Gabriola Island, Canada, 1998.

[2] World Commission on Environment and Development (the Brundtland Commission), Our Common Future, Oxford University Press, New York, 1987, p. 43.

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oping its SMS, management created an SMS Steering Committee, which was initially comprised of Designworks/USA's Director of Finance and the Director of Operations. A year later, the committee structure was expanded to include a representative from each department. This section describes how Designworks/USA implemented the SMS standard by creating a sustainability policy, enumerating SMS aspects and impacts, developing an impact prioritization scheme, drafting action plans to address prioritized SMS aspects, and conducting the initial internal SMS audits. The section concludes with a discussion of the third-party certification process.

Sustainability Policy

One of the first steps the SMS Steering Committee took was to develop a Sustainability Policy. The policy includes a commitment to continuous improvement of environmental, economic, social and ethical performance. Furthermore, the policy commits Designworks/USA to encourage all of its stakeholders—including suppliers, contractors, and clients—to implement similar practices. The SMS policy is available on the company's website: www.designworksusa.com.

Environmental issues are directly addressed in many portions of the company's SMS Policy, including a commitment to continuously improve environmental performance and to incorporate "responsible resource use" and "environmental protection" into products designed for clients. Furthermore, the policy calls for Designworks/USA to incorporate the BMW Group's Environmental Guidelines into decision-making.[3] Social issues are also directly referred to in Designworks/USA's SMS policy. The policy commits the company to "meeting or exceeding all ... health and safety legal requirements" and to continuously improve social and ethical performance. The policy also requires Designworks/USA to incorporate social responsibility into product development and advanced communications consulting services.

SMS Aspects

After developing the policy, each department was tasked with creating a comprehensive list of environmental, social, and economic aspects. These are defined, respectively, as elements of an organization's activities, products, or services that can interact with the environment, society, and the economy. After listing their aspects, departments categorized each one as relating to environmental, social, or economic issues.

Identified environmental aspects include on-site issues such as solid wastes, emissions, effluents, and resource use, as well as environmental issues associated with products designed for clients, including those associated with their manufacture, use, and end-of-life disposition. Most environmental aspects associated with on-site activities, such as the modeling shop and general building operations, resemble those typically found in an ISO 14001 EMS. For example, Operations identified various waste streams and resources consumed as a result of their activities. More innovative environmental aspects related to the products the firm designs for its clients. For instance, the design departments identified as environmental aspects several opportunities during the project workflow process to suggest environmental criteria to clients, explore product life cycle impacts, and expand clients' environmental/sustainability thinking. A sample of identified environmental aspects and impacts are presented in Table 2 (next page). The Significance column will be explained below.

Social aspects include on-site issues such as employee retention and turnover, optimal working conditions, gender and racial equity, workload and sufficient staffing, building

[3] The BMW Group's International Environmental Guidelines are incorporated in the BMW Group *Sustainable Value Report* 2001/2002, available at www.bmwgroup.com.

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Table 2: SMS Aspects analysis: environmental

Department	Activity	Aspect	Impact	Significance
Design/ Engineering	Product options and attributes brainstorming	Identify opportunities to include environmental and sustainability criteria into product attributes and performance evaluation, and to expand scope of client's business considerations	Potential to reduce environmental impact of manufacture, use, disposition of products, and of product processes	26
Operations/ Shop	Paint booth	Spraying and paint removal activities, sanding and cleaning	Employee exposure, potential for environmental release, VOC emissions, dust and grit release	20
Purchasing/ Operations	Supplier relations	Environmental screening criteria applied to suppliers and vendors	Improved decision-making process and potential influence over environmental, social, and economic issues	25

evacuation and first responder training, indoor air quality, and general environment, health and safety (EH&S) awareness. The action plans also identified off-site social aspects. For example, child/forced labor and human rights screening criteria applied to suppliers/vendors and the dissemination of information and idea generation by teaching at local design schools. In relation to the design process, social aspects were not identified to the same level of specificity as were the environmental aspects. Some of the social aspects and impacts identified are presented in Table 3.

The economics aspects identified were primarily related to four themes: (1) increasing

Table 3: SMS Aspects analysis: social

Department	Activity	Aspect	Impact	Significance
Human Resources	Hours worked	Workload, sufficient staffing	Employee satisfaction and health; quality of life	28
Purchasing	Procurement	Child/forced labor and human rights screening criteria applied to suppliers/vendors	Awareness of supplier/vendor organizational behavior	26
Designers	Teaching at local design schools	Dissemination of information and idea generation	Opportunities for environmental, social and economic awareness in design	24
Design/ Engineering	Product options and attributes brainstorming	Identify opportunities to include environmental and sustainability criteria into product attributes and performance evaluation, and to expand scope of client's business considerations	Potential to reduce environmental impact of manufacture, use, disposition of products, and of product processes	26

revenue by increasing sales to niche customers interested in sustainability management; (2) reducing various business risks; (3) improving employee productivity; and (4) reducing operating costs. For example, an aspect related to Human Resources included improving incentives to employees for creativity, innovation, and business development. The corresponding economic impact is improving employee productivity. Business recovery (Operations) is an aspect associated with the impact of mitigating risks of downtime. Table 4 illustrates a few additional economic aspects and impacts that were identified.

industry leadership. A score for each aspect was calculated by adding the seven sub-scores. While the SMS standard calls on the company to "consider inviting interested parties to participate in the prioritization of its sustainability aspects," Designworks/USA conducted this process in-house, with the assistance of BMW Group and WSP. Designworks/USA management indicated that they may invite interested parties to participate in this process in the future. After scoring each aspect, each department focused its efforts on those aspects with the highest scores, and set to work developing objectives and targets for many of these.

Table 4: SMS Aspects analysis: economic

Department	Activity	Aspect	Impact	Significance
Marketing	Develop success stories from use of environmental/ sustainability considerations in projects	Use SMS as market advantage	Improve Designworks/USA's economic opportunities and performance, and contribute to advancing client base environmental and sustainability thinking	(Not rated)
Design	Teaching at local design schools	Dissemination of information and idea generation on "green design careers"	Improve recruiting	28

Aspect Prioritization

All aspects were prioritized along the following seven dimensions: probability of occurrence; intensity; duration; legal and regulatory requirements; stakeholder concerns; leadership potential; and level of control. Each dimension was scored for each aspect using a five-point scale. In each case, a score of one represented the lowest priority or significance, such as the lowest probability of occurrence or the least intense impact. A score of five represented the highest priority or significance, such as an impact being of great concern to many stakeholders or where the impact presents an opportunity to demonstrate

Objectives, Targets, and Action Plans

After identifying and prioritizing aspects and impacts, each department created an SMS Action Plan. This document listed several prioritized aspects and described an objective for each one. To achieve each objective, one or more targets were established, and an individual was assigned the responsibility for meeting the target by a particular deadline. These plans are revised frequently following the SMS discussions that begin each department's weekly meeting. After a few targets were met, each department added other aspects, objectives, and targets to their SMS Action Plan.

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Vol. 10, Issue 2 (February 2003) ISSN 1066-7938

Participation and support of management was critical in the process of creating action plans. For instance, Director of Transportation Design Greg Brew, who serves as his department's SMS Lead and sits on the SMS Steering Committee, noted "An enthusiastic Director allows people in the department to be into it, to become involved." Where managers were particularly committed to the implementation of the SMS, for example in Transportation Design and Operations, action plans were prepared, action plan items were diligently addressed, and corrective action items from SMS audits were promptly implemented. Where commitment from management lagged, the process suffered. For example, the manager of one of the largest design departments neither attended nor sent a representative to SMS Steering Committee meetings where the action plans were coordinated. Consequently, the SMS action plans did not reflect the work or concerns of his department. He also declined to involve his staff in the weekly discussions of SMS. As a result, his design staff had not been thinking about incorporating SMS into their design processes due to their lack of exposure to, and consequent minimal understanding of, the Designworks/USA SMS processes. As the company has become more energized and committed to the SMS, this manager has recently begun to participate and involve his staff members, who are beginning to understand and enthusiastically embrace SMS as part of their work.

A few items from various departments' SMS Action Plans are presented in Table 5 (next page). The actual documents include additional columns to denote the person responsible and the deadline associated with each target.

Internal Audits

The SMS standard requires that an internal audit be conducted annually to ensure that business operations and decision-making throughout the organization conform to both ISO 14001 and the SMS standard. The internal SMS audit team, which consists of volunteers from several departments, developed separate SMS audit reports for the Design / Engineering, Marketing / Communications, Supply / Finance, Human Resources, and Operations departments. The audit scope includes examining the policy, aspects, objectives and goals, the development of each SMS Action Plan, compliance with legal and other requirements, and the extent to which each department applies SMS to customer relations and onsite activities. Internal audits have been conducted semi-annually since August 2001.

Certification and Registration

Designworks/USA sought to have a third-party organization certify that its management system fully adhered to both the SMS standard and ISO 14001. Leveraging its experience with ISO 14001 and EMAS certifiers, BMW Group and WSP initially identified ten certification bodies, and used a systematic qualification process to initially reduce this number to three and subsequently select TÜV Süddeutschland. In December 2001, Designworks/USA became the first industrial design firm in the world to be certified to ISO 14001. Two months later, Designworks/USA became the first company in the world to achieve third-party SMS certification.

Results and Future Challenges

An article in the next issue of *CES Journal* describes the preliminary outcomes of the SMS and challenges Designworks/USA faces in its ongoing SMS development efforts. For example, management challenges that will be discussed include creating a common SMS vision across all departments, training employees to speak knowledgeably about sustainable design, stimulating customer demand, and developing metrics to assess their performance. In addition, that article describes how the SMS is facilitating BMW Group's commitment to implement the United Nations Global Compact's human rights, labor, and environmental principles.

Table 5: SMS Action Plan Excerpt

Dept.	Aspect	Category	Objective	Targets
Design/ Engineering	Identify opportunities to include environmental and sustainability criteria into product attributes and performance evaluation, and to expand scope of client's business considerations	Environmental & Social	Build capacity within design and engineering groups to enable effective assessment and coaching of clients on product environmental and sustainability issues	Develop product sustainability assessment tool for use in initial tutorial and on defined client projects
Operations	Consumption of electricity from building usage	Environmental	Educate workforce to reduce energy consumption (i.e. turn off lights and computers at night, computers, space heaters, lessen use of screen savers)	Train all employees
Purchasing	Environmental and social aspects of suppliers and vendors	Environmental & Social	Screen suppliers and vendors to understand their environmental and social issues and their management commitment	Develop questionnaire, including environmental and child/forced labor issues based on SA 8000 and send to top 100 vendors and all new vendors
Design	Dissemination of information and idea generation on "green design careers"	Economic & Social	Propagate SMS thinking in Design Schools curricula via teaching program commitment, with goal of enhancing recruiting and expanding design and engineering	Identify at least five design schools (or in house design firms in our client base) to be targeted with teaching program Prepare teaching materials for use by design and engineers in teaching program Deliver at least 4 teaching sessions

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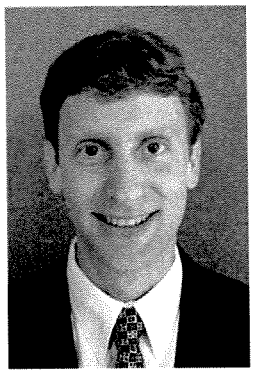
Corporate Environmental Strategy: International Journal of Corporate Sustainability
Vol. 10, Issue 2 (February 2003) ISSN 1066-7938

Acknowledgements

The authors gratefully acknowledge those Designworks/USA employees who provided information to support this case study, including Nadya Arnaot, Craig Eggly, Holger Hampf, Soren Petersen, Sheila M. Walker, Arnd Wehner, Kristi Yates and especially Greg Brew and Nicole Kranz. We value the useful information provided by Suzanne Dickerson, Guido Prick and Chris Bangle of BMW Group. In addition, we appreciate the insights offered by Edward Quevedo and Phil Stewart of WSP Environmental North America. Finally, we thank Christine Rosen for helpful feedback on earlier drafts.



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