

# REFLECTIONS ON EXISTING SUSTAINABLE DESIGN AND ECODESIGN INFORMATION TOOLS

Consideraciones sobre las  
herramientas de información del ecodiseño y  
diseño sustentable existente

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## RESUMEN

*Aunque el Diseño Sustentable en particular y la Sustentabilidad en general, han estado en la mente del público y de las compañías en años recientes, ha sido observado que muy pocos realmente conocen lo que significan dichos términos o tienen suficiente información de calidad para aplicar realmente cualquier medida sustentable en sus productos o procesos. Esto es particularmente notorio en México, donde las PyMES (Pequeñas y medianas Empresas) se encuentran atrasadas en información. Desde inicios del año 2000, una solución propuesta a solucionar esta brecha informativa es la generación de herramientas tales como: guías, manuales y sitios web. Este artículo revisa algunas de estas herramientas disponibles y reflexiona en las características deseables que deben tener para ayudar a PyMES mexicanas que quiera implementar medidas sustentables o de ecodiseño en sus productos y procesos.*

**Palabras clave:** Diseño Sustentable, PyMES, Herramientas de la información, Ecodiseño.

## ABSTRACT

*Although Sustainable Design in particular and Sustainability in general have been at the forefront of the public and companies minds, it has been observed few of the actually know the terms or have enough quality information to actually apply any sustainable measure in the products and/or processes. This is particularly notorious in Mexico, where SME's are behind in terms of information generating a knowledge gap that can impact in the competitiveness. One proposed solution applied since the early 2000's is the offering of information tools (such as guidebooks and websites) that allow closing this knowledge gap. This paper reviews a handful of the available information tools aimed for Small and Medium Enterprises (SME's) in an initiative to help them apply Ecodesign or Sustainable Design in their products and processes. Finally it reflects in the advisable characteristics this kind of tools should have posses when they are proposed and created for Mexican SME's*

**Keywords:** Sustainable Design, SME's, Information tools, Ecodesign.

## INTRODUCTION

One of the more used words nowadays is Sustainability. Everybody wants to be sustainable, and every company wants to be that. The problem lies in the lack of proper information to allow the interested parties to even know what really implies to be sustainable, what it is needed. There is a visible knowledge gap about sustainability, sustainable design and even its predecessor ecodesig. This gap often foils any attempt by any company, specially Small and Medium Enterprises (SME's). This is more noticeable in Mexican SME's. As such, it has become germane to develop tools that help companies to close this knowledge gap and raise awareness and better understanding of what are sustainability, sustainable design and ecodesign, with the aim of helping these companies to be more competitive, socially responsible and sustainable. Experiences in Europe and Central America have shown that one successful approach for raising awareness and understanding in SMEs, is the creation of different types of tools. There are few if none of such tools available for Mexican SMEs. In response to this, seven of the most interesting and potentially relevant tools identified through the literature review have been evaluated, to identify whether any of them are appropriate for translating directly into Spanish to meet the needs of the Mexican market, or alternatively to identify potential characteristics which can be used in the development of a specific tool for Mexican SMEs. The tools - EMAS SME Web Toolkit (European Commission, 2004), Information/Inspiration (Lofthouse, 2004), The Sigma Guidebook (The Sigma Project, 2003), Design for Sustainability manual (Crul and Diehl, 2006), the PROMISE manual (Brezet and van Hemel, 1997), Ecodesign Infoknoten (ECODESIGN Team, 1996) and Ecodiseño Centro America (CEGESTI, 2006)- were selected on the basis of their focus on SMEs, or sustainable or eco design processes, their level of accessibility, and the appropriateness of their content.

Each of these tools was analyzed against a series of desirable and non desirable characteristics to determine which characteristic should be used to developing a tool aimed for Mexican SMEs.

### EMAS (ECO-MANAGEMENT AND AUDIT SCHEME) SME WEB TOOLKIT

The EMAS SME Web Toolkit is a guidebook which is presented in the form of a website, within the main EMAS website (European Commission, 2004). It is a free resource written in English which can be found at <http://ec.europa.eu/environment/emas/toolkit/> using Microsoft Internet Explorer software or similar. Aimed at European SMEs, it aims to explain how to introduce environmental management into the manufacturing process and obtain EMAS certifications. It works through the explanation of environmental policies, how to carry out audits, offer of additional resources and case studies to serve as examples.

The format of this tool allows the user to directly access whatever information they require via hyperlinks nested in an index. This allows them to either resolve specific enquires or access a detailed, step-by-step guide of how to apply this kind of management approach. The best trait of this guide is that information is presented in small bites, as opposed to longwinded texts, which require time to be read. It also offers examples of successful case studies from different members of the EU, classified by sector, which illustrates how other companies could approach similar problems regarding sustainable design. The key disadvantage of the tool, however is that the structure is messy, which causes navigation problems.

## INFORMATION/INSPIRATION

Information/Inspiration is also presented in a web format and can be accessed for free at [www.informationinspiration.org.uk](http://www.informationinspiration.org.uk) (Lofthouse, 2004). This website was developed with industrial designers in mind, rather than SMEs. This tool is divided in two main sections information and inspiration. 'Information' offers the user information about Ecodesign. The different subsections are accessed through tabs located in the left. These tabs contain the following information:

- Getting Started: explains three basic steps to start the improvement of the design or process.
- Tools: provides access to different Ecodesign tools, such as the Ecodesign Web and the Design Abacus.
- New Ways of doing it: reflects on new ways to deliver a desired product.
- Materials: presents different Ecodesign strategies that can be used around the consideration and selection of materials.
- Distribution: Considers how the distribution of products to the end consumer can have a significant impact on the over all environmental impact.
- Use: presents Ecodesign strategies (such as inclusive design, educating the user, alternative energies) to reduce the product impact during the use stage.
- Optimal Life: explains how determining the functional life period of the product can have an impact on the overall sustainability of the product.
- End of Life: presents Ecodesign strategies to deal with the end of life of the product.

- Legislation: introduces different European legislation such as Waste Electrical and Electronic Equipment (WEEE) directive, the Restriction of Hazardous Substances (RoHS) directive and the Energy using Products (EuP) legislation.
- Ecolabels: explains the different kind of ecolabels, such as 'Energy Star' and 'Green dot' that help consumers to choose products.

The main focus of the 'Inspiration' section is to present the user with inspiration from existent products and design concepts. Each product subsection includes different products, with images and a description about how they are sustainable. Information/Inspiration also contains a contact page and a search engine to look for specific concepts.

The layout is user-friendly, very attractive and dynamic with an index map of the site and a search engine, which facilitates the experience. The information is presented in small nuggets which are quicker and easier to read and understand. Though originally created in this way to meet the needs of designers, this is also a characteristic sought by managers in Mexican SMEs.

## SIGMA GUIDEBOOK

The Sigma Guidebook is another free resource. It is an electronic document, in the form of an Adobe Acrobat pdf file. It was developed by the British Standards Institution, Forum for the Future and Accountability as a key part of the Sigma Project (SIGMA Project, 2001). It is divided in seven sections where it is explained what sustainability is and the aims of the SIGMA Guiding Principles, how it was developed, its principles, how to apply it, the critical phases during the implementation, toolkits and appendices

The Sigma Guidebook is very detailed, providing long explanations of each phase of implementation. Although it does not include tools, it does explain how to use the tools developed by the Sigma Project. Despite the fact that the manual uses a colored index to identify different sections, the length of the guidebook makes it time consuming to read. However, despite these limitations, this guidebook was strongly recommended as tool for SMEs by the Quality and Environmental Manager at Bovince Ltd (Hall, 2001) and used by them in their endeavors. It could be argued that this guidebook, with its relative complexity was created with engineers and business managers in mind, rather than entrepreneurs or people who do not have specific technical knowledge. In the case of most Mexican SMEs, founders/managers know how to manage the company in general, but usually do not have the technical knowledge needed to understand a complex guidebook (Carrillo, 2007).

## PROMISE MANUAL

The 'Ecodesign: a promising approach to sustainable production and consumption' manual, known as the PROMISE Manual, developed by Brezet and van Hemel at Delft University of Technology is presented as a binder with section dividers (Brezet and van Hemel, 1997). Of the five tools evaluated in this study, it was the only one provided in a physical rather than digital format. Though the complete manual is bulky, its physical form and internal layout make it easy to access specific information which can be removed for portability. This does however raise the potential risk of missing pages.

Probably the most interesting element of the PROMISE manual is its structure, which uses mind maps to guide the user to the different sections. Their value lies in the graphical representation which speeds up access. Among the offered tools there is a detailed explanation of Life Cycle Assessment Methods (such as the MET Matrix), usually useful for manufacturing companies whose products tend to produce considerable amounts of waste; and one of the most mentioned methods in the literature. The information is offered again, in small 'nuggets'. Interestingly, this tool is aimed at SMEs around the globe. The previous three tools are more focused in European and/or British companies of different size. However, as it is written in English, there is still the same language barrier for companies from non-English speaking countries.

## DESIGN FOR SUSTAINABILITY

The Design for Sustainability guidebook (D4S) (Crul and Diehl; 2006) was based on the PROMISE manual outlined above. D4S was created specifically for SMEs in developing countries, taking into consideration the generally accepted limitations of these companies (Crul and Diehl, 2006), while PROMISE was intended to be used by any company around the world, regardless of its location (Brezet and van Hemel, 1997). D4S provides information about successful examples in developing countries, such as Costa Rica. The D4S guidebook can be found either as an interactive webpage or a PDF file. Both versions are visually attractive and dynamic, making good use of pictures and diagrams. It is divided in three sections:

- Part I: What it is Design For Sustainability: provides an introduction and explanation of basic concepts.
- Part II: How to do D4S in Practice: explains how to apply these sustainable concepts in a well thought through work plan. It also mentions benchmarking of current products and how to improve them through the use of the recommendations and methods offered in the manual.
- Part III: Reference Information: provides case studies, extra tools such as creativity techniques and recommended lectures.

The information is presented in a clear, concise way; is easy to read and use, addressing each issue in a clear language, without lengthy paragraphs. It also offers examples and information that considers the particular conditions of SMEs located in developing countries. It provides worksheets, creativity techniques, guidelines about how to deal with particular and offers explanations about the available sustainable design tools. In 2008 the manual was translated to Spanish and Vietnamese and delivered in PDF format (Crul and Diehl, 2006).

D4S is the most relevant to this study and has some limitations that need to be considered. The case studies are focused on product design; however, not all the Mexican SMEs have the capacity of designing products. Some of these SMEs instead are focused in providing services rather than making products. Others only make products following the specifications of their clients. Another concern is that, although D4S uses a fairly clear and easy to understand language, it suffers from the same problem that the Sigma Guidebook, where the length of the text, can make it difficult or time consuming to read, although the inclusion of explanatory graphics lessens these effects.

## ECODESIGN INFOKNOTEN

Ecodesign Infoknoten is an information platform developed by the Institute for Engineering Design, Vienna University of Technology and sponsored by the Austrian Federal Ministry for Transport, Innovation and Technology, Siemens and Phillips. It is aimed at European companies and aims to explain simply how to introduce Ecodesign concepts and tools into the manufacturing process. It is divided into four main sections, each one with its own subsections:

1. Introduction: explains the origin and purpose of the website and contains general information about environmental product design/ECODESIGN.
2. Research: it provides links to diverse sources of Ecodesign research.
3. Methods: provides methods and links to download software to apply Ecodesign. The three main subsections are 12 steps, Software and Environmental Assessment
4. Implementation: provides examples and legislation information for the implementation of Ecodesign.

Amongst its advantages is the ever present index, allowing the user to keep track of his whereabouts. This web tool is also being constantly updated with new information and the format allows easy access.

The Ecodesign Pilot tool included in the main site, works in a semi-independent way, easily accessible through a box that appears in each section of the tool. This tool allows the user to search for strategies to be applied in each stage of the production process (such as alternatives to raw materials material). A second option is the use of the 'Assistant', which provides the user with an assessment of the critical stages of the life cycle of the selected product and will suggest concrete ideas and solutions to modify the product's life cycle within environmental standards, based in a database of similar products. This is an excellent tool to provide to SMEs as it allows a quick assessment of their products. However it requires of extended technical knowledge. The key disadvantages of the tool are that the current format lacks of clarity and could result in confusion of terms by the user of the tool, reducing its effectiveness in providing information.

## ECODISEÑO CENTROAMÉRICA

The Ecodiseño Centroamérica guidebook was developed by the Technical University of Delft in collaboration with UNEP and CEGESTI, to be used with Central American companies. It focuses on the process of adapting the know-how from Europe regarding Ecodesign, into the companies using the guidebook. It is structured in two parts. The first describes the importance of integrating environmental requirements into products with the aim of making products more competitive. The second part presents the methodology for applying Ecodesign, as a knowledge transfer process. The methodology splits into six steps, providing examples for each step: company strategy and organization, pick a product, and analyze the product, new ideas creation, detailing the concept and continuous evaluation.

One interesting quality was that it provided practical examples or summaries of case studies with each definition of a core concept, allowing the user to relate the theory to practical examples. This guidebook also provided plenty of management tools and explains in detail the benefits of Ecodesign and how is related to cleaner production. Until 2008, the manual could be downloaded from the website of Ecodiseño Centroamérica, however this is no longer the case. The link to download it was replaced with a link to access the D4S manual.

## REFLECTIONS ON THE DESIRABLE AND UNDESIRABLE CHARACTERISTICS FOR A WEB BASED TOOL

Previous research on topics of knowledge transfer to SMEs show that it is possible to assume that guidebooks or web based tools have potential to fill the sustainable design knowledge gap of Mexican SMEs. This has been already done in some cases, with guidebooks such as D4S that were created with SMEs from developing countries in mind. However, while it can be argued that any of the tools presented in this paper could be translated into Spanish, and that developing countries in Latin America

share some cultural, social and historical links; their context and needs of their industries differ (e.g. environmental legislation and local policies). For these reasons, the challenges that the implementation of a Sustainable Design tool might face are likely to be different from country to country. Therefore, it is advisable to develop a specific tool for Mexican SMEs as it will be tailored with these issues in mind.

It should be noted that, with the exception of Ecodiseño Centroamérica, all the tools are 'stand-alone'. This means that they were developed in such way that they are able to convey and transmit the information without any help from external sources (namely a 'consultant'). These tools are aimed to be used by SMEs on their own.

One of the main barriers to applying sustainable design measures in Mexican SMEs is the language barrier (Barrera, 2001) both in terms of the language that the tools are written in and the nature of the language used. Many existing Ecodesign tools are written in English and not Spanish which limits their usefulness to the Mexican market. Some of them are written in a technical way which might not necessarily be appropriate to the types of personnel working in SMEs. These language barriers, coupled with the excessive amount of similar terms and a lack of awareness/ understanding which appears to be available in Mexico adds to a general level of confusion (Casalet, 1999; Barrera, 2001).

However analyzing the tools has provided useful insights into the types of characteristics that can be used and how they can be achieved during the development of a tool for SMEs.

## CONCLUSIONS

By drawing inspiration from the tools analyzed it is possible to identify successful desirable characteristics, which can be used in the development of a tool that would meet the needs of the Mexican SMEs. From the analysis of the state of the art tools presented it can be seen that attention should be paid to the following:

- Accessibility and guidance: clear formats, mindmaps and interactivity are a must.
- Length of the information: small pieces of information have better chance to reach the user, opposed to longer texts.
- Graphics: images coupled with text makes the guidebook look friendlier and transmit better the ideas.
- Tools: offering explanations of which Ecodesign tools are available and how to use them in the company.

- Case studies: to provide inspiring examples to SMEs that the user can feel related to or even use as guide.
- Keep the technical requirements to the minimum.
- Internet format might be better than printed format.
- The tool should be developed to be able to work as 'stand-alone', without any external help, as it might not be possible to offer constant support to the SMEs.

By analyzing successful tools, it has been possible to gain a better insight into how to structure possible a guidebook for SMEs, the type of sections to include and how to address specific points of sustainable design in an attractive way, enabling an easy understanding and interaction by the user.

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