



0170

Significances of Matter in Design (SMD) A Portuguese Design Research Project about Sustainability, Identity and Innovation.

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1. The Project “Significances of Matter in Design” (SMD)

The Project “Significance of Matter in Design” (SMD) is about the “world” of Matter (material resources) in Design and its relation with the aspects of Cultural Identity, Innovation and Sustainability.

The Project SMD is integrated in the context of applied research in Design and has as goal to explore, reflect, demonstrate and disseminate activities related to the thematic of material resources in Design for Sustainability.

The Project SMD is promoted by SUSDESIGN¹, which main activities are Design, Research and Education in the field of Design for Sustainability.

The main activities described in the current paper took place during the year of 2005 with the participation of professional researchers, designers and students, from five national and international institutions: SUSDESIGN¹, FBAUL³, DUT⁴ and IADE⁵. Additionally Local Portuguese Artisans working with different materials and crafts skills were participating in the SMED project.

The Project main output was a Design Exhibition which showcased the design projects of 14 Portuguese contemporary Designers working with different local materials in collaboration with 7 regional artisans. Other relevant out put was the exhibition catalogue that synthesis the main achievements and results of the SMD Project (Mestre, Diehl et al. 2005).



2. The Context of the SMD Project

2.1 Design for Sustainability

At a global level we can observe the relation between Design and the new paradigm of Sustainable Development. One of the 'hot' contemporary design issues is related with the integration of the social, environmental and economical aspects in Design often referred as Design for Sustainability.

Our common challenge of 'Sustainability' is to provide social and economic well-being for everyone locally and globally, now and in the future, without compromising the long-term well being of the environment (Brundtland 1987). This is even a bigger challenge if we take into consideration a growing world population and a meanwhile continuous increase of consumption of products and services per person.

To open our mind: Over 30 tonnes of waste are produced for every tonne of product that reaches the consumer. And 98% of those products are thrown away within 6 months. When you include these hidden impacts of producing the raw materials and the manufacturing processes of the product itself, we each consume our own body weight every two days (Datschefscki 2002).

Though 'sustainability' is widely accepted as a general goal, it is often still rather intangible in practice for consumers, enterprises and designers. The so-called "Triple Bottom Line" concept (Elkington 1998) provides a more transparent picture by elucidating sustainability by three main pillars; Profit (Economic Prosperity), Planet (Environmental Quality) and People (Social Equity).

Designers and enterprises can (and should) take an active role in this challenge. It is, for example, estimated that as much as 75% of the environmental impacts (as well as the costs) that a product throws off throughout its lifetime is determined at the design stage (Ottman 2004). By connecting the Product Design Process to the concept of Sustainability, a fourth 'P' of Product can be added with as result the 'Design for Sustainability 4P Triangle' (Diehl 2005). The connection between People, Profit, Planet and Products suggests a smooth process in which all '4 Ps' get the same attention and are in equilibrium during the design process. In reality, the daily design practice, this is more complex than it looks at a first sight.

Until recently, most of the experiences in design, research and industry practice have been focused on Ecodesign. Ecodesign concentrates on optimizing the ECONomical (Profit) and meanwhile minimizing the ECOlogical impact (Planet). In other words, the social cultural aspect (People) has been so far often ignored (Diehl 2005).



Figure 1: The Design for Sustainability 4P Triangle (Diehl 2005)



One of the big challenges of the 'SMD: Significances of Matter in Design' project is to enter this still limited explored field of socio-cultural (People) aspects in relation to the design discipline and product life cycle.

Within the Project SMD, the following Sustainability issues are taking in account (Mestre 2005):

- Social aspects (people) by taking into consideration the local production of products. Local production stands for use of local technological competences, use of local expertise and know-how; creation of new working places in decentralized regions.
- Economical aspects (profit) by the development of new innovative products with the use of local resources (local available materials) that will be capable to enter in the global market as 'Regional quality products' and meanwhile increasing the local economies.
- Environmental aspects (planet) by the development of products that make use of local available renewable resources, that are both extracted and transformed in new products at a regional scale avoiding environmental impacts related with the use of non-fossil and toxic materials as well avoiding impacts related with the transportation of materials.

2.2 Design for Cultural Identity

The conscious introduction of cultural and identity aspects into product design, is a topic which is gaining popularity in some parts of the World, and has become a trend in design during the last years.

The expression 'cultural identity' commonly is defined by the expression of values, norms and artifacts of a certain group of individuals (or community). These communities can be related for instance with a particular region (Wikipedia 2006).

The word *culture*, from the Latin *colo, -ere*, with its root meaning "to cultivate", generally refers to patterns of human activity and the symbolic structures that give such activity significance.

Designers are one of the new professionals interested into to work with Culture, particularly with what's related with Material Culture (related with everything that's produced by man, like artifacts, etc). There are other disciplines, like anthropologists that already explore this thematic for a long time. Moreover, anthropologists understand 'culture' not only in relation to consumption goods, but to the general processes which produce such goods and provide them with a meaning, and to the social relationships and practices in which such objects and processes become embedded (Wikipedia 2006).

One intends that regional craft products are part of the material culture of a certain region and they express a certain "cultural identity".

Cultural Identity itself became a more relevant issue in Design while integrated in the so called globalization in which we can observe an increase of standardization of products around the world.



The availability and promotion of local crafts could definitely contribute to 'keep alive' the cultural identity of the cultures around the world.

2.3 Design for Innovation

Innovation is as *the process of making changes to something established by introducing something new*. The term innovation may refer to both radical and incremental changes to products, processes or services (Crul 2003). Product innovation is related with the process of innovation within the context of a product.

Design is an effective mean of innovation (Bonsiepe 1992), being a catalizer that match two dimensions: the micro dimension of cultural relate aspects, strongly connect with the national production capacity and with the particularities of local cultures (and its identity) and with the macro dimension of economical and commercial aspects, that creates an strongly need for the understanding of the expectations, needs and opportunities of the new competitive global markets.

The Design practice is considered for several business innovation strategies, essential for the development of local economies. As example one refer the innovation strategy of South Korea (Chung 2004) that represents the improvement of this Country on product innovation.

Design can, integrate both tradition and innovation, bringing together the old concepts, know-how, materials and techniques with the new projectual solutions that present the new contemporary thoughts.

A designer is often a catalizer of the innovation process by managing multi-disciplinary information and knowledge social global topics, as well as new emerging topics, varying from the use of traditional methods, technologies and cultural aspects till the integration of new scientific technological developments, integrating all types of knowledge into the new design solutions.

Design is used in SMD Project as the "tool" for the development of new sustainable products. The SMD Project intends to be a contribution for the increasing of 3 relevant issues in Design: Design for Identity, Sustainability and Innovation.

3. The focus of SMD Project – the use of local materials and skills in Design

On a national and international level, research and development in the field of materials and production technologies have led to the development of promising new sustainable materials. These materials distinguish themselves from ordinary materials by for example consuming less raw materials and energy during production, by being lightweight, by avoiding damage during the disposal stage of the products or by including cultural and social aspects during production and use. These materials can be based on high-tech innovations as well as on the 're-invention' of traditional materials and processes. However, these promising sustainable materials only will have a real positive contribution to sustainability if they are indeed applied in new products. Designers play a critical role in this stage: he or she can stimulate or even decide to apply more sustainable materials into the product design.



We can observe different trends in the consideration of materials in Design (Mestre & Diehl, 2005):

- At the International level, we observe the development of the scientific field of material mainly related with the use of new materials and technologies that consider a efficiency of materials use, as well the optimization of the applicability, inspiring the development of new sustainable products and design solutions.
- At a Regional level, we observe the use of traditional (related with regional cultures) that consider the cultural aspects of the materials, as well, in some cases its high relevance in avoiding environmental impacts (when we consider large availability of local renewable and non toxic resources in substitution with the use of synthetic or long distance material resources). Also, the use of local human resources and technical knowledge (as regional artisans) has a social importance for Design. The last relevant issue, is related with the promotion of innovation in Regions where scarce access to new technologies and with difficulty in the promotion of local economies by other means. Design can contribute for the promotions of local economies by means of integrating local know how and culture in Innovative Cultural oriented Product Design.
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The field of SMD project is related with the second issue: Re-introducing traditional materials and skills blended with industrial design dedicated to modern sustainable consumer society.

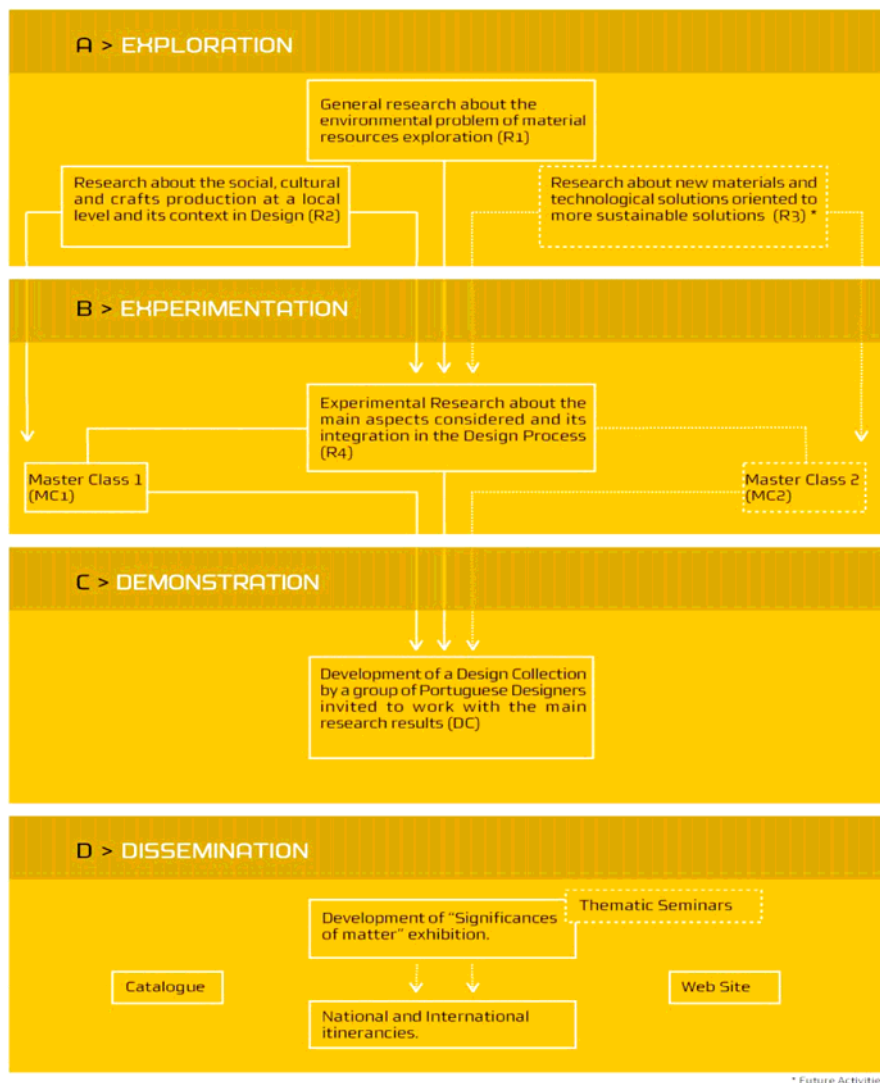
4. Design Research Methodology within the Project SMD

The SMD Research methodology integrates different types of research: fundamental (based on bibliography sources); field research (based on observation of the working methods and techniques) and applied research (the exploration theories becomes practice). The four main phases of the Project were:

- Exploration Phase: The first phase of the SMD Project was related to the Fundamental and Field Research phase. The fundamental research occurred during four months of the one year project and integrates several research themes as 1) the environmental impacts of materials extraction and use and 2) the social and cultural aspects of the local arts and craft production and its contextualization in Design. The Field Research took place during one month and focused on the previous selected region of Portugal – Alentejo. The region was selected based on the amount of local materials availability and local competences in traditional production techniques.
- Experimentation Phase and Demonstration Phase took place parallel: It was concerned the development of Design Concepts by 14 invited Portuguese Designers from different generations. These phases of the SMD Project integrated one Master Class that joined Designers, Researchers and Artisans for the discussion and development of Practical Design Projects. This Master Class occurred in the Alentejo region during 3 days. The master class integrated discussion sessions, as well visits to the artisan's workshops. The working prototypes were manufactured by 7 selected artisans and followed by the Designers.
- Dissemination Phase: The last phase of the project includes the development and production of an international exhibition each included the main results of the project, with a focus on the 14 design projects. Other dissemination materials were the project catalogue and the Website.



Figure 2: SMD Project Methodology (Mestre & Diehl, 2005)



5. The Field and Literature Research – *Discovering Context, Resources and Artisans*

The Project field research started with the selection of the region in which the work should take place. The selected region was Alentejo, a southern region of Portugal (the biggest Portuguese region in scale) with a huge availability of crafts small-scale traditional industries. The Alentejo region is characterized by a Mediterranean climate and is abundant in resources as wood, natural fibers (vime), stone, clay, metal and a huge availability of cork.

The field research was executed in 3 cities in the Alentejo region. These cities are characterized by their big tradition in crafts (Lima 2001): Estremoz, Redondo, Montemor-o-Novo and Évora.



The recognition of the Local Context, at different levels: Social and Human, Cultural, Environmental and Economical was the starting point of this research. These findings were relevant to understand how the future design activities could be integrated in the different referred levels.



Figure 3: the 6 selected materials used in SMD Design Project: Clay, Cork, "Vime" (top), Wood, Stone, and Metal (down).

During the field research, the promoter team, joined the relevant information for the Design Process:

- Collect useful technical and non technical information for designers;
- Did several visits to the local crafts industries and artisans workshops (observe the work condition and production limits);
- Select the more open and social artisans in order to facilitate the communication with the invited Designers;
- Select five main materials and techniques to be applied into the new products design.

The field research was complemented with some relevant findings in literature. These references were mainly literature about National and Regional context of Crafts in Portugal. The most important reference for the literature research was the book collection "Traditional and Contemporary Crafts in Portugal" (Various 2000). In Table 1, we can find an example of the type of information collected during the field and literature research for the six selected materials.

Table 1: Synthesis of information about Cork Material

(Source: adopted from (Mestre, Ruivo et al. 2005)).

Parameters	Cork Material
General	Density: cavum structure material; low-density material.
	Resistance: unskid, later burner, water resistant, heat and sound isolation, high capacity of compression.
	Flexibility: high elasticity.
Formal	Colors: dark brown (outside) and yellow brown (interior).
	Texture(s): bark: irregular with wrinkles; interior: smooth with wrinkles nodes.



	Surface: depend on the additional treatments.
	Weigh: low weight, related particularly with it's low density.
Sensorial	Olfative: neutral, sometimes smells like resin.
	Tactual: tepid, several according surface treatment.
	Auditory: silence material, even while is transformed (manufactured).
	Visual: flat light brown or dark brown material.
Environmental	Biodegradability: 100 % biodegradable if it is not used additional chemical treatments (surface or agglomerate cork).
	Recyclability: 100 % recyclable if it is not used additional chemical treatments (surface or agglomerate cork).
	Resources use: in the manufacturing process, 100 % of the input material is used; the production waste material will be reused again for cork agglomeration.
	Toxicity: 100 % non-toxic if additional chemical treatments have been used (surface or agglomerate cork).
	Distance from material extraction and transformation place: Cork grows in Alentejo Region, it is extracted locally from the trees, and it is transformed in different regions in Portugal. Industrial cork factories are manly in the North of Portugal. Small-scale hand-crafts producers are mainly in Alentejo.
Cultural and Socio-Economic context	<p>The Cork tree is original from the Mediterranean forest. Is the most abundant tree in Alentejo Region. From the beginning of economical-social development in Alentejo Cork plays an important role.. First, being the base material for a handy-crafts technique called “arte pastoril” (the translation is “sheep man art”), secondly in a more advanced period being the based material fo the first regional functional artifacts (one example is the traditional Alentejo recipient for food, where land people will take their lunch).</p> <p>Cork material gets its main world recognition with the industry of cork for wine bottles. Still playing a really important rule in Portuguese economy. Portugal is one of the Worlds Leaders of Cork Manufactures. This situation makes from this Sector, a strategic sector for new solutions and business.</p>
Perspective of Future	Cork has a high potential for innovation, situation that gives Cork crafts industry a good perspective for development in the future.

6. SMD Briefing Session

The Design Brief session occurred during one afternoon with the participation of the 14 invited Designers. The Promoter team presented in the briefing session the results of the Literature and Field Research; as well they provided an inside of the main ideas of Design for Sustainability. The session was concluded with the presentation of the Design Brief.

In the following text we can find a synthesis of the Design Brief as presented to the Designers (Mestre, Ruivo et al. 2005):

(...)The Designer should select in maximum two types of materials and then he or she should develop a design concept that explicit shows the added value of using the selected material and techniques. The Design Concepts should be finished in the period of one month (...)



(...)For the development of the Design Projects we organize an event called “Master-Class” where all Designers and artisans are invited to be. This Master-Class will be organized in 3 workshops and will happen after the Conceptual Design phase is finished. The workshops sessions were the following: 1st Design Concepts Presentation (Designers Workshop), 2nd Cross Workshop between Designers and Artisans, 3rd Product Prototypes Development (...).

(...) After the workshops and the finalization of all the development work, the prototypes will be integrated in a collective in September 2005. Other National and International exhibition points would be considered (...).



Figure 4: Participants at the SMD Briefing Session

7. A Master Class between Artisans and Designers

Considering the relevant information useful for the Design Process, the SMD Project included 3 types of workshops involving Designers and Artisans, occurred during 4 days in the Alentejo Region. The workshops were the following:

- 1) The Designers workshop: Design Concepts Presentation session and Designers discussion group.
 - 2) Designers and Artisans workshop: collaborative work and discussion in order to find the most appropriate production processes for the projects.
 - 3) Prototypes Workshop: Start up the development and production of the prototypes in Artisans workshops. After the workshop the prototypes have been finalized in one month time.
- Workshop 1: Design Concepts Presentation (Designers Workshop)

The first workshop occurred in a Room of an Old Convent in the City of Montemor-o-novo in Alentejo Region during one day the group of 14 Designers from different background experience and ages presented and discuss the 14 Design Concepts. The designers make use of different types of presentations (Makeup, 3D, Drawing, etc).

- Workshop 2: Cross Workshop between Designers and Artisans

The second workshop occurred in the same room of the old convent in the City of Montemor-o-novo. In this session the promoter’s team joined Designers and Artisans in a discussion session around the Design Concepts proposed by the designers. These sessions aimed to find the more appropriate solutions and techniques for each project, as well bringing together two different “worlds” Design and Arts and Crafts in a informal level of communication in order to facilitate the products development process.



- Workshop 3: Product Prototypes Development

The third workshop occurred in the practical workshops of each artisan. Artisans were the main responsible for the correct development of the products. During the prototype development the Designers could still make some changes in the main design concept according the new findings with the artisans. In some cases two or more testing prototypes have been developed before the last version. Prototypes were ready in one month time after the first session.



Figure 5: The workshops at artisan's work places.

8. The Design Projects - a cross connection between crafts and contemporary

8.1 The Design Projects within SMD

During the period of four months, the 14 designers with the help of 7 artisans developed the 14 projects / products.

Each Designer developed a different concept based on one or more of the selected traditional materials and techniques from Alentejo. The different products, materialized in prototypes, reflect different understandings of the regional materials and the local cultural aspects.

Table 2: Information (Project name, Type of product, Designer, material use, Skills / Techniques) about the 14 Projects / Products develop during the Master Class, Designers

Project name	Type of Product	Designer	Material Use	Skills & Techniques
<i>Puf-fup</i>	Seat	Ana Mestre	Cork	Half industrial, half hand work (micro scale industry).



Hexaedra	Office accessory	Carlos Barbosa	Clay & Cork	Hand work (crafts).
Milk Man Strike	Seat	Elder Monteiro	Metal	Hand work (crafts).
Cantaro Cantor	Pitcher (water container)	Fernando Brizio	Metal	Hand work (crafts).
Vapor	Tea pot	Ines Secca Ruivo	Clay & Cork	Hand work (micro scale clay industry).
Vasilhó	orange juice squizer	José Viana	Clay & Wood	Hand work (micro scale clay industry).
Estante	Cupboard	Miguel Arruda	Cork	Half industrial, Half hand work.
Stand-up	Seat	Paulo Bago d'Uva	Metal	Hand Work(Crafts).
Cadeira Monte	Chair	Paulo Parra	Wood & "Buinho" (natural fiber)	Hand Work (micro scale industry).
Candeeiro Alentejano	Lamp	Pedro Leitão	Wood & "Vime" (natural fiber)	Hand Work (micro scale industry).
Cadeira Corque	Chair	Pedro Silva Dias	Wood & Cork	Half industrial, half hand work (micro scale industry).
Banco I	Seat	Raúl Cunca	Cork	Hand Work (micro scale industry).
Ouriço	Biombo	Rogério Ribeiro	Metal and "Vime" (natural fiber)	Hand Work (Crafts).
Terra	Seat	Rui Pedro Freire	"Vime" (natural fiber)	Hand Work (Crafts).

8.2 "puf-fup" Project: a sensory experience of matter

"puf-fup" was one of the outcome products of the SMD project, bringing together tradition and innovation in Design. "puf-fup" has been design based on the following quote: "Re-think, Re-form, Re-feel and not less ... Recycle".

The first concept behind the "puf-fup" project is to turn around the structure of the traditional *puf*. Bringing the interior material from the traditional *puf* to the outside and substitute it for natural materials like Cork. The second main concept of "puf-fup" is to add to the conventional function of seating, the sensorial experience of the material in use which results from the direct contact of the body with the Cork.

The cork creates a specific sensorial experience which is related with it's own physical characteristics. Cork is a natural material, smooth and light with some elasticity, creating a perfect comfort feeling when you seat on it.

"puf-fup" is shaped by perfect spheres which give ergonomic and therapeutic characteristics when used to seat. The spheres have a middle hole and are connected by a "line" (cotton string). One unit is constituted by 2500 spheres that turn the object structure changeable and flexible, making possible to use it in multiple seat postures for relaxing. So many, as the user is able to think, to create or fell. "puf-fup" is an amusing object that challenges the creativity of the user.



Figure 6: the "puf-fup" project, design by Ana Mestre.

Additionally, "puf-fup" integrates the three ideas in discussion in SMD Project: Sustainability, Identity and Innovation in Design.

- 1) The Environmental Sustainability aspects of the "puf-fup" are closely related with the Cork material, a natural local material, 100% renewable, 100 % biodegradable and 100% recyclable. Other environmental aspect of cork is the 100% use of material in production (all production waste material it can again be reuse for another valuable sub material of cork, that's common known by agglomerate cork material). The Social Sustainability aspects are related with the use of local human resources and know how, creating jobs for local people. The Economical Sustainability aspects are related with the possibility of develop and produce a new product considering the new trends in Design, and the trends in the external markets, creating an attractive innovative product able to compete in the international market.
- 2) The identity aspects are mainly related with the cultural meaning of Cork material for Portugal, particularly important in the Cultural and Socio-Economic context of Portugal. The huge tradition of this material in Portugal, related either with the availability in nature either with the quantity and quality of Cork Products from Portugal, are particularity connect with the production of cork for wine bottles. However, there is an enormous space for the development of new innovative products.
- 3) The innovation aspect of the "puf-fup" is related with the introduction of innovation tools of Design in the development of this new product. A complete new concept has been translated in a new product using traditional products, however prepared to compete in the competitive markets. The idea of minimization of the production steps to the minimum as possible has lead to a really efficient



product in terms of production. There are only 3 steps: 1) preparation of the cork spheres, 2) link the cork spheres in a long cotton string 3) give a final form to the *puf*.

9. Evaluation and Conclusions

The outcomes of the project were attracting more attention than expected. The exhibition was extended and several of the designed products have been exhibited in internal galleries in amongst others Lisbon, Berlin and London. Also the interest from the press and design magazines was overwhelming. The melting pot of contemporary design, sustainability and cultural identity seems to be a so far under explored field with a promising potential.

Not only, the reactions from outside the project were positive, but also within the project positive reactions were received by the contemporary designers with regard to their interaction with the local artisans and the traditional materials and crafts of the Alentejo region. The approach of the project by interacting between the designers and artisans by means of a master class in the region and by working in the artisan's workshops facilitated a kind of natural, not forced, interaction and exchange of skills and knowledge.

At the beginning of the projects there was a wide range of objectives related to sustainability. At the end of the project it was concluded the social, human and cultural aspects have been taken more or less thoroughly taken into account into the designs of the designers. In that sense the project can be concluded as successful. However the two other aspects of sustainability, planet (environmental aspects) and profit (economical aspects) have been integrated on much lower level into the final designs.

The project has started up a knowledge exchange (including practical knowledge like skills) between designers, artisans, academics and students. To continue and stimulate this exchange of knowledge, SUSDESIGN and her partners will initiate similar kind of projects related to design, sustainability, identity and cultural heritage (find more at www.susdesign.org).



10. References

- Bonsiepe, G. (1992). *Teoria e Prática do Design Industrial*. Lisbon, Centro Português de Design.
- Brundtland, G. H. (1987). *Our Common Future World*. Oxford, Oxford University Press.
- Chung, K.-W. (2004). *Korean Design Strategy and the Role of Design Education Played to Build Korea into an Industrial Giant*. *Design Education Forum of South Africa*, Pretoria, South Africa.
- Crul, M. (2003). *Ecodesign in Central America*. Design for Sustainability research program. Delft, Delft University of Technology.
- Datschefski, E. (2002). *Sustainable Products*, Biothinking International.
- Diehl, J. C. (2005). *The Design for Sustainability Challenge for Designers*. *SM Design: Significados da Matéria no Design*. Lisbon, SUSDESIGN.
- Elkington, J. (1998). *Cannibals with Forks: the Triple Bottom Line of 21st Century Business*, New Society Publishers.
- Lima, R. d. A. (2001). *Artesanato Tradicional Portugues Volume VII: Alentejo*, Amadora.
- Mestre, A. (2005). *Design de uma ideia o Séc. XXI com tradição de oito séculos*. *SMDesign: Significados da Matéria no Design*. Lisbon, SUSDESIGN.
- Mestre, A. & Diehl, J.C. (2005). *SMD Project: Final Report*. Lisbon, SUSDESIGN.
- Mestre, A., Ruivo, I.S. et al. (2005). *SM Design: Significados da Matéria no Design; Alentejo*. Lisbon, SUSDESIGN.
- Ottman, J. (2004). *Design: Green, business solutions for sustainable products*. Design Green, New York, J. Ottman Consulting.
- Various (2000). *Artesanato da região do Alentejo*. Évora, Instituto do Emprego e Formação Profissional - Delegação regional do Alentejo.
- Wikipedia (2006). www.wikipedia.com.

¹ SUSDESIGN, starting as a Group of Designers under the name “Association for the Dissemination of Design Culture and Sustainability”, is actually a private entity for the “Promotion of Design for Sustainability” from Ana Mestre, the conceptual founder of SMD Project and SUSDESIGN (find more at www.susdesign.org).

² IA “Instituto das Artes” from the Portuguese Cultural Ministry (www.iartes.pt).

³ FBAUL “Faculdade de Belas Artes de Lisboa”- The host institution of SMD Exhibition (www.fba.ul.pt).

⁴ DUT “Delft University of Technonology”, join the Project with the it’s “Design for Sustainability Program” from the “Faculty of Industrial Design Engennering” (www.io.tudelft.nl).

⁵ IADE “Instituto de Artes Visuais, Design e Marketing”, join the Project with it’s “ESD - Escola Superior de Design” and “UNIDCOM – Unidade de Investigação em Design e Comunicação” (www.iade.pt).