THE INTEGRATION OF SOCIAL CRITERIA IN SUSTAINABLE DESIGN FOR FURNITURE

José Vicente[1], Rui Frazão[2], Cristina Rocha[3], Fernando Moreira da Silva[4]

[1]CIAUD, Faculty of Architecture, TU Lisbon, Rua Sá Nogueira, Pólo Universitário Alto da Ajuda, Sala 6.1.12, 1349-055 Lisbon, Portugal, jmanvicente@gmail.com, +351 96 2789480

[2]LNEG, Lisbon, Portugal, rui.frazao@ineti.pt

[3]LNEG, Lisbon, Portugal, cristina.rocha@ineti.pt

[4]CIAUD, Faculty of Architecture, TU Lisbon, Portugal, moreiradasilva.fernando@gmail.com

Abstract

Sustainable design is a complex area that integrates a wide range of environmental, social and economic criteria. This paper is part of a research (www.designsustentavel.org) that intends to develop a toolkit and information for wood furniture designers to use in their work process and that should push this product range closer to the sustainable production and consumption system. In the course of this research it has been understood that the available information on social criteria is more general and difficult to implement by designers. Not only it appeared to be distant from the designer's area of influence, but also too scarce and general when compared with environmental criteria already in use on ecodesign tools. The profusion of environmental criteria versus the lack of proper social criteria creates an imbalance on the available decision supporting criteria for the product development team. To tackle this problem the research team analysed the social issues proposed by ISO 26000 and conducted an expert workshop to establish relevant social criteria for this industrial sector that were within reach of the designer action. This paper presents (1) the process of selection, analysis, reflection and discussion of relevant subjects, (2) the effort to involve the stakeholders and (3) the main findings of this process considering the specific characteristics of the wood furniture sector in Portugal.

Keywords
Sustainable design, social criteria, design tools, wood furniture, product development.

1. Introduction

Design is closely tied to how society, culture and environment interact, and therefore the responsibility of designers in these areas is a key factor in our common effort towards a sustainable and harmonious society (Amland, 2004), aiming to keep high levels in quality of life in industrialized countries and extending them to all other countries. In this sense designers must address the problems of our time: the environment, sustainable development and globalization (Walker, 2006). This implies a comprehensive view of problems and interactions between material, environment, economic, demographic, cultural and ethical aspects.

Working towards this concern is the designation sustainable design, which involves an inclusive but more comprehensive approach than those made so far in design with environmental concerns. In order to move to a paradigm of sustainable production and consumption is necessary that our material culture becomes more benign in a variety of ways (Walker, 2006). Among these criteria are, of course, environmental concerns, but it is also necessary to pay special attention to social issues to address all pillars of sustainable development: the triple bottom line of sustainability. Sustainable design should therefore have two objectives: (1) to facilitate the systematic integration of sustainability information on the design process and (2) promote the creation of information allowing to realize the load a particular product or service has on the production and consumption system.

The integration of environmental criteria in product development did not alter the basic structure of the design methodology (Hemel, 1998), so we can extrapolate that with the integration of social criteria that will not happen also. However, it is noted that we should give equal importance to all criteria (Bhamra e Lofthouse, 2007). To make this possible it is necessary to address the problem in a holistic and integrated way, which requires new types of information and product development tools for designers to use.

This paper aims to present the process of analysis and discussion made by this research team, with the purpose of defining social criteria relevant to the furniture industry. Here will be exposed the research that serves as background to this paper, including relevant tasks performed in the selection of social criteria and determining the relationship between the characteristics of design tools and the products in this sector. It will also be explained the process that led the team to realize it would need an expert workshop to select and define social criteria that were relevant to the sector and that were within the scope of the designer.

Finally we present the results of this discussion, namely the set of strategies and criteria that aim to work alongside with environmental concerns on a checklist.

2. Research Context

Towards a more efficient, practical, operational and focused approach to sustainable design, the research "Contributions to a sustainable design methodology applied to the furniture industry: The Portuguese case" (www.designsustentavel.org) is being developed. Based on the recommendations made by Hemel (1998) which indicated that the formulation of specific strategies for a particular group of companies can achieve significant efficiency gains, as some industries are more oriented to certain forms of action than others and that sectoral initiatives have already proven to be an influential stimulus in the direction of design, this research aims to promote a sustainable design approach focused precisely on the sectoral level, in this case in the field of home furniture.

The aim of this research is to develop a set of sustainable design tools for designers, to be used on the development of home furniture products whose main material is wood or wood-derived.

To this aim, a methodology was designed that includes the study of three main areas: sustainability, design and furniture (Vicente et al., 2009). For sustainability, the philosophy, principles and criteria were studied in order to relate them, in a practical way, with the design. In addition, the development of ecodesign, the strategies and tools were analyzed to understand how improvements can be made to join the sustainability criteria with the everyday needs of the furniture sector. For the furniture, and so that the tools developed are efficient and appropriate, we examined the products life cycle and the design processes used inside the companies.

Therefore this research starts from the assumption that sustainable design tools need to integrate all different aspects of sustainability in reach of design and not only address the environmental concerns.

The design of this research includes a literature review, case studies analysis, survey of the furniture sector in Portugal, interviews with an experts' panel on ecodesign and sustainable design and, finally, the development of a model in form of tools and their validation.

2.1. Furniture

In previous generations the relationship with furniture was more durable, today the use rate of these products is much higher, influenced by fashion factors (EGP, 2007), obsolescence and fragility of the products themselves. Moreover, there are increasingly concerns about the

environmental problems of furniture and with the quality of breathing air inside the buildings. (CSM, 2006), to which the furniture products significantly contribute.

Wood is a natural material whose sustainable management is increasingly practiced in Europe and in Portugal (CEIBOIS, 2007a) and through which it can contribute to reducing CO2 levels via three factors: (1) effect of absorption of carbon in the forest; (2) carbon storage in products and (3) substitution of materials that are intensive in terms of carbon (CEIBOIS, 2007a). Therefore, wood has the rare ability to contribute to the mitigation of CO2 through the only two possible ways: reducing emissions and carbon storage. However, the potential this material can have on the environment should not be viewed isolated but inside the social context where the various stakeholders in the supply chain are integrated, because in that context other impacts may arise.

The wood furniture sector in Portugal, though a modern industry, does not avoid being human resource intensive which helps explain the vulnerability to rising costs of labor and competition from countries with cheaper labor costs (Bärsch, 2001). It comprises a vast majority of small and medium enterprises (CSIL, 2007), from the c. 2500 only about 500 companies employing more than 5 workers (EGP, 2007). It is a sector that has evolved over the past decade, both in technological terms and investment on new materials and design, but still turns his back to the more skilled components of the innovation system: technological centers and universities (EGP, 2007). Additionally, the sector has been classified as strategic for the country (MEI, 2009) due to its positive balance in the import/exports relation (AIMMP, 2007).

In the survey directed to the Portuguese companies of home furniture made in this work was concluded that the use of design to product development is now done mostly by designers (47% internal designers + 10.8% + 4.6% outside independent designers or design studios) and that this is mainly because they feel that design is an important tool to create innovative products (81.3%).

For this sector, the main aspects identified at European level in the context of social responsibility include health and safety at work, flexible working hours, training, gender equality, impact on local communities and the environment (CEIBOIS, 2007b). However when the survey questioned the involvement of interested parties, only customers, employees and suppliers are listed significantly. We can therefore conclude that only the stakeholders who are directly linked to the company are considered relevant. Regarding the criteria taken into account in product development, as can be seen in Figure 1, only the traditional criteria are usually considered by companies.

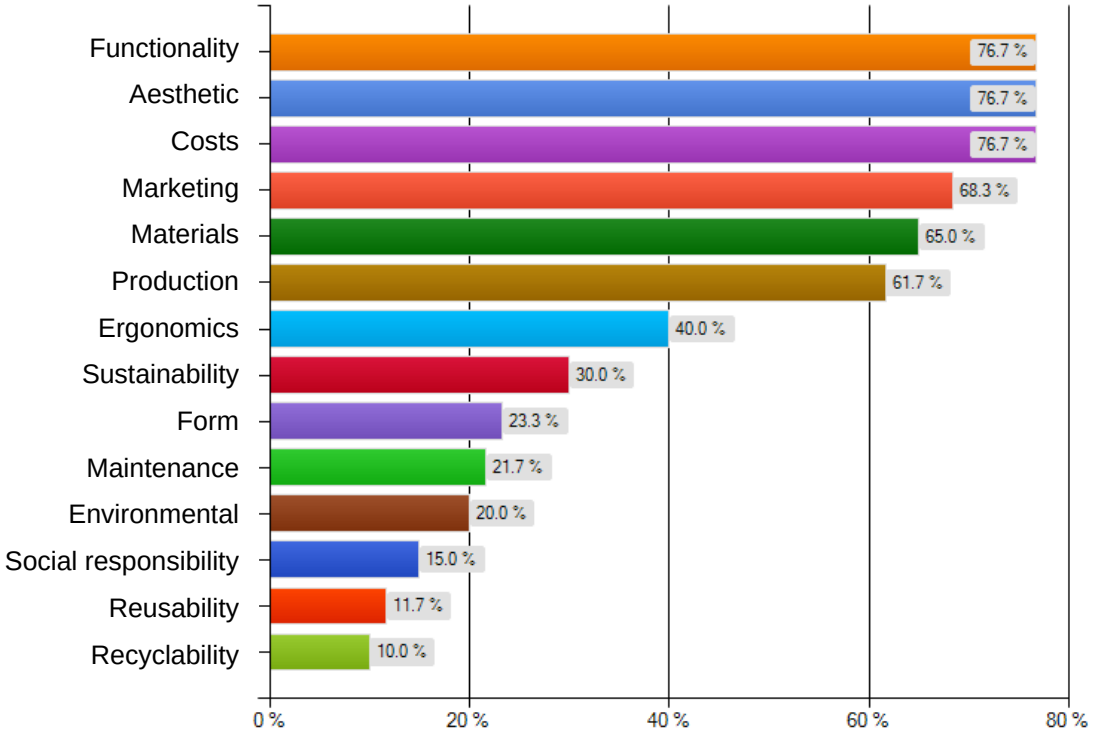

Figure 1: Criteria considered in product development

On the other hand, it is noteworthy that 83.1% of the companies feel the need for tools that can help integrate the various criteria for product development and that 85.7% of the companies are sensitive or very sensitive to all the environmental, economic and social problems associated with sustainability.

This overview means the tools being developed should help improve this scenario, making it easier to bring companies together with all stakeholders, enabling integration of the various sustainability criteria at the same level and in a simple and versatile manner, appropriate to the fragility of the industrial fabric and to the disparities that exist in the product development process from company to company.

2.2. Design tools

To integrate environmental aspects into product development, designers need support tools (Byggeth e Hochschorner, 2006). Based on the experience of ecodesign we can say that the development of tools, with information and strategies to support them, is essential for the practical implementation of sustainable design (Vicente et al., 2009), in particular methodologies and tools that deal and integrate social and ethical considerations along with the environmental (Charter e Tischner, 2001).

From the information gathered in the survey about the use of tools we can see that in addition to the traditional techniques of drawing, CAD and CAM, only the checklists, being generic, are used by over 25% of firms (Figure 2). Most design tools are not known or used by the industry, apart from the life cycle assessment, although known, is not widely used. The actions and strategies implemented in design for the environment had conservative responses. This tends to worsen when we approach the social area. When asked about the knowledge or use of standards on social responsibility or performance indicators on social responsibility, the overwhelming majority does not know or intend to use (> 70%).

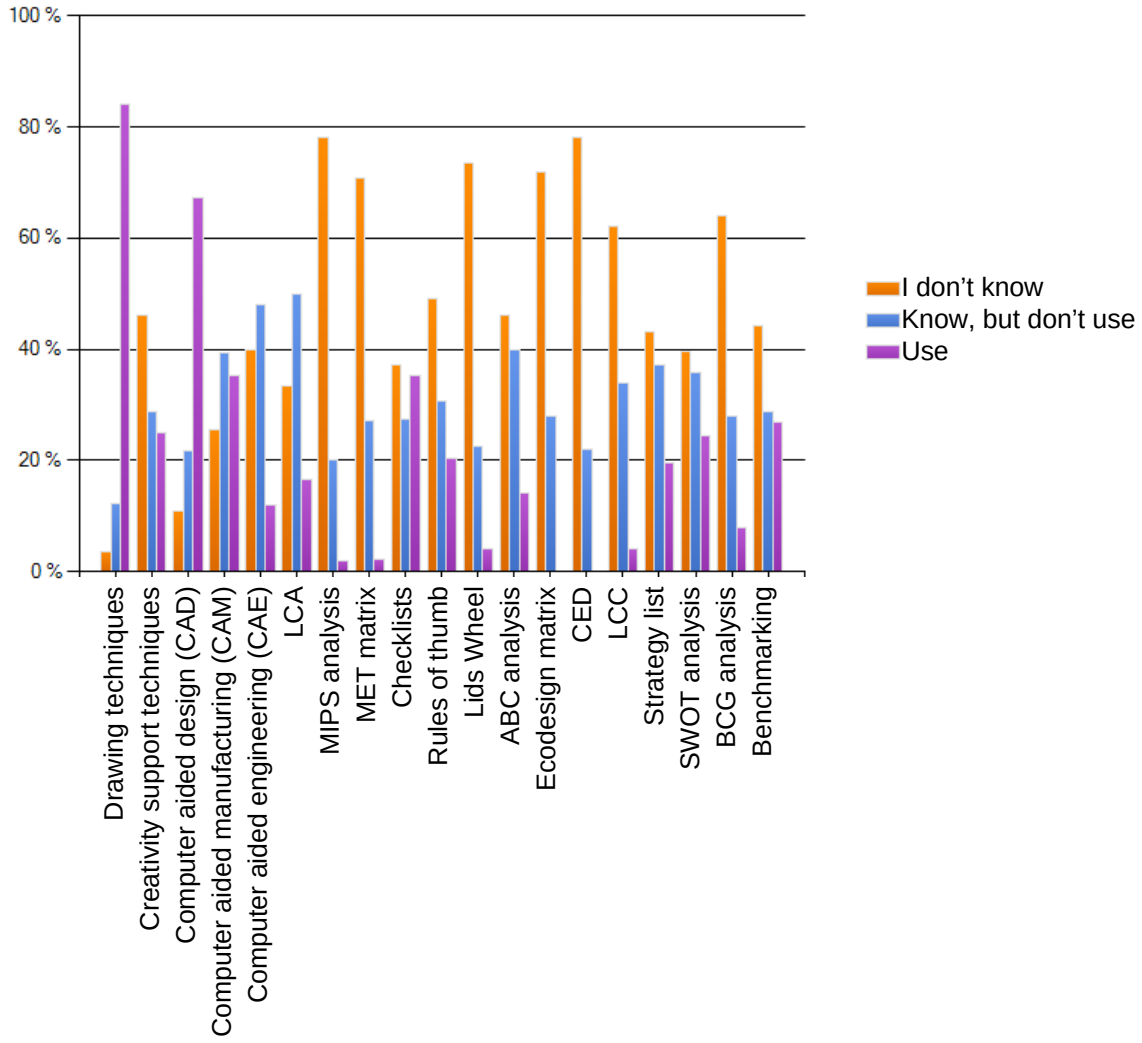

Figure 2: Tools and techniques used or known

This data reinforces the information on the existing gap between companies and tools, but at the same time shows the companies need for a set of tools that help integrate the various aspects in the product development process in an adequate manner.

3. SDf Toolkit

Since there are four objectives for the design tools: (1) analysis, (2) selection and definition of priorities for improvement, (3) support the generation of ideas, (4) coordination with other criteria (Tischner et al., 2000), the toolkit "Sustainable Design for Furniture" (SDF) developed in this research tries to encompass all these aspects in order to meet the specificities of the sector. Therefore, this toolkit comprises a set of five qualitative, low complexity and small application time tools organized to suit the design process. It has an introduction with the objectives, the most relevant concepts and description of the tools followed by their templates: # 1 Priorities List; # 2 Checklist; # 3 Matrix 3 E's: # 4 Network Diagram; # 5 Table of Trade-offs.

Tool # 1, designated Priorities List, gathers the 18 strategies (which are detailed in Tool # 2) for sustainable design, 5 in the area of social responsibility and 13 in the environmental areas. The tool is intended for the product development team, together with top management, to set priorities in the design strategies. It aims at defining priority actions for the next design cycle and should be used seamlessly with the company's strategic plan.

Tool # 2, designated Checklist, presents a list of criteria relevant to this product category and for each design strategy. Its purpose is the verification of the correct integration of different strategies. It can be used by the product development team at different stages of the process in accordance with the priorities outlined in Tool # 1 for both social responsibility and environmental areas. The structure and operational mode of this tool is based on several checklists (Behrendt et al., 1997) (Frazão et al., 2006) (Tischner et al., 2000).

Tool # 3, called 3E's Matrix, is a table used to classify and represent the analysis of a previous product or a solution in which we are working on. It aims at exposing the weaknesses and identifies potential improvement areas. The analysis is done along the life cycle and according to the elements for each of the three E's: Economy (Cost / Benefit Analysis), Ecology (resources / emissions) and Social Equity (Internal / External). This tool is based on the known MET Matrix (Brezet e Hemel, 1997) which did an analysis of the environmental components.

Tool # 4, known as Spider Diagram, is based on models of web or polar diagrams - LIDS Wheel; Eco-compass; Siper-Web; Ecodesign Web - (Brezet e Hemel, 1997) (Tischner et al., 2000). This spider diagram is intended for a specific group of products and aims at broadening the scope beyond ecodesign. Therefore, it introduces two significant changes: (1) each vector contains two axes, representing the ecology and the social equity throughout the stages of life, and (2) the size of each axis is different to match the importance that each phase has on the entire life cycle. Similar to the previous polar diagrams, the purpose of this

tool is to evaluate, compare and visualize solutions/ products. This will be done based on social and environmental information covered in the previous tools of the kit.

Tool # 5, called Table of Trade-offs, is a table for harmonization of the various criteria that can conflict, for which we must make a trade-off. It aims at explaining and systematizing the required decisions to reduce the harmful interactions between criteria throughout the lifecycle. It can be used for interaction between the criteria presented in the checklist or other traditional criteria.

Since the creation of the toolkit, the research team attempted to develop equally environmental and social aspects. Nevertheless, the environmental side has already a long discussion and practice on the various strategies and criteria that can be taken into account. This is reflected in extensive literature, case studies and consensus when questioned experts in the area. But in social information it's only available in certain approaches to sustainable design, most of which are impractical in nature or yet very close to ecodesign and, therefore, suffer the same problem in integrating the third pillar of sustainability. To correct this situation we aimed at finding different sets of criteria and principles on international standards in the area of social responsibility. Including the UN Global Compact (UN, 2008), SA8000 (SAI, 2008), NP4469-1 (IPQ, 2008), G3 GRI (GRI, 2007) and ISO 26000 (ISO, 2009). From these documents, a matrix was created (Table 1) to cross check the criteria identified in each document and to find which ones were related to the sector, leaving aside the section on environment and management.

Table 1: Matrix of social responsibility documents (Part1 of 4)

SOCIAL RESPONSABILITY		NP	ISO	GRI	UN	SA
Human Rights	Right to life	X	X		X	
	Right to home ownership, privacy and family	X	X		X	
	Right to freedom of expression	X	X		X	
	Right to freedom of movement	X	X		X	
	Right not to be deprived of liberty	X	X		X	
	Right to work and decent working conditions	X	X		X	
	Right to food and a decent life	X	X		X	
	Right to health	X	X		X	
	Right to education	X	X		X	
	Right to freedom of religion, thought and sexual	X	X		X	
	Right to property	X	X		X	
	Diversity	X	X	X	X	
	Elimination of all forms of forced labor		X		X	
	Effective abolition of child labor		X		X	
	Non-discrimination and Gender Equality	X	X	X	X	X
	Maternity and paternity rights	X	X		X	
	Reconciling professional, family and personal	X	X		X	
	Integration of persons with disabilities	X	X		X	
	Children's rights	X	X		X	
	Indigenous rights, indigenous and ethnic minority	X	X	X	X	
	Rights of migrant workers	X	X	X	X	
	Due diligence		X			
	Avoid complicity through acts or omissions		X			
	Effective mechanisms for complaint resolution		X			
	Contracts with clauses on human rights			X		

Table 1: Matrix of social responsibility documents (Part 2 of 4)

Labour Practices	Recognition of a legal relationship		X	X		
	Equal opportunities and non discrimination		X	X	X	
	Protecting personal an private information of employees		X	X		
	Responsible practices by suppliers		X	X		
	Child labour	X	X	X	X	X
	Forced labour	X	X	X	X	X
	Job Security	X	X	X		X
	Termination of the employment relationship	X	X	X		
	Working time / schedule	X	X			X
	Holidays and social protection	X	X			
	Freedom of association and collective bargaining	X	X	X	X	X
	Protection of trade union rights	X	X		X	X
	Disciplinary Practices	X	X		X	X
	Recognition and reward for the work	X	X			
	Remuneration and financial benefits	X	X			X
	Profissional mobility	X	X			
	Active aging	X	X			
	Sexual and moral harassment	X				
	Occupational Health and hygiene	X	X	X		X
	Workplace Safety	X	X	X		X
	Occupational diseases	X	X	X		X
	Accidents at work	X	X	X		X
	Vocational training	X	X	X		
	Career development	X	X			
	Skills development	X	X			
	Employability	X	X			
	Placements and curriculum	X	X			

Table 1: Matrix of social responsibility documents (Part 3 of 4)

Fair Operational Practices	Suppliers subjected to assessments			X		
	Anti-corruption		X		X	
	Partnerships for development of new products	X				
	Fair Trade Practices	X	X			
	Undue influences	X	X			
	Segregation of markets, suppliers and customers	X	X			
	Subcontracting	X				
	Conduct anti-cartel and monopoly	X	X			
	Intellectual property	X	X			
	Industrial espionage	X	X			
	Fair competition	X	X			
	Legitimate and responsible pressure	X	X	X		
	Cooperation with public institutions	X				
	Politically responsible contribution and involvement	X	X	X		
	Involvement for political ends	X	X	X		
	Partnership relations with suppliers	X				
	Knowledge sharing with suppliers	X				
	Mutual development and synergies with suppliers	X				
	Technological innovation in support of Sust. Develop.	X				
	Attracting and retaining talent	X				
	Respect for patents and copyrights	X	X			
	Promote social responsibility in the sphere of influence		X			

Table 1: Matrix of social responsibility documents (Part 4 of 4)

Consumer Issues	Health and consumer safety	X	X	X		
	Information on content, use and maintenance	X	X	X		
	Conflict resolution and disputes	X	X			
	Deceptive practices	X				
	Privacy and data protection	X	X			
	Meeting needs and expectations	X				
	Foreign sales and after-sales	X	X			
	Goods and services quality	X	X			
	Information, training and education for s. consumption	X	X			
	Warranties	X	X			
	Traceability of goods and services	X				
	Responsible advertising	X	X			
	Access to essential services		X			
Community involvement and development	Education and culture	X	X			
	Sponsorship / Philanthropy	X	X			
	Volunteering	X	X			
	Social activities	X				
	Public health / welfare	X	X			
	Participation of citizens and organizations	X				
	Support local trade	X				
	Support local community development	X		X		
	Involvement with community	X	X	X		
	Conditions for improving the welfare of the neighborhood	X		X		
	Hiring local	X	X	X		
	Development and access to technology		X	X		
	Wealth and income creation		X	X		
	Skills development		X			

From this selection we asked in the survey what were the most relevant aspects to the furniture industry (Figure 3) and, again, the mostly identified relate more to the internal functioning of firms than with their relationship with external stakeholders and society. This shows a non-comprehensive view of social responsibility.

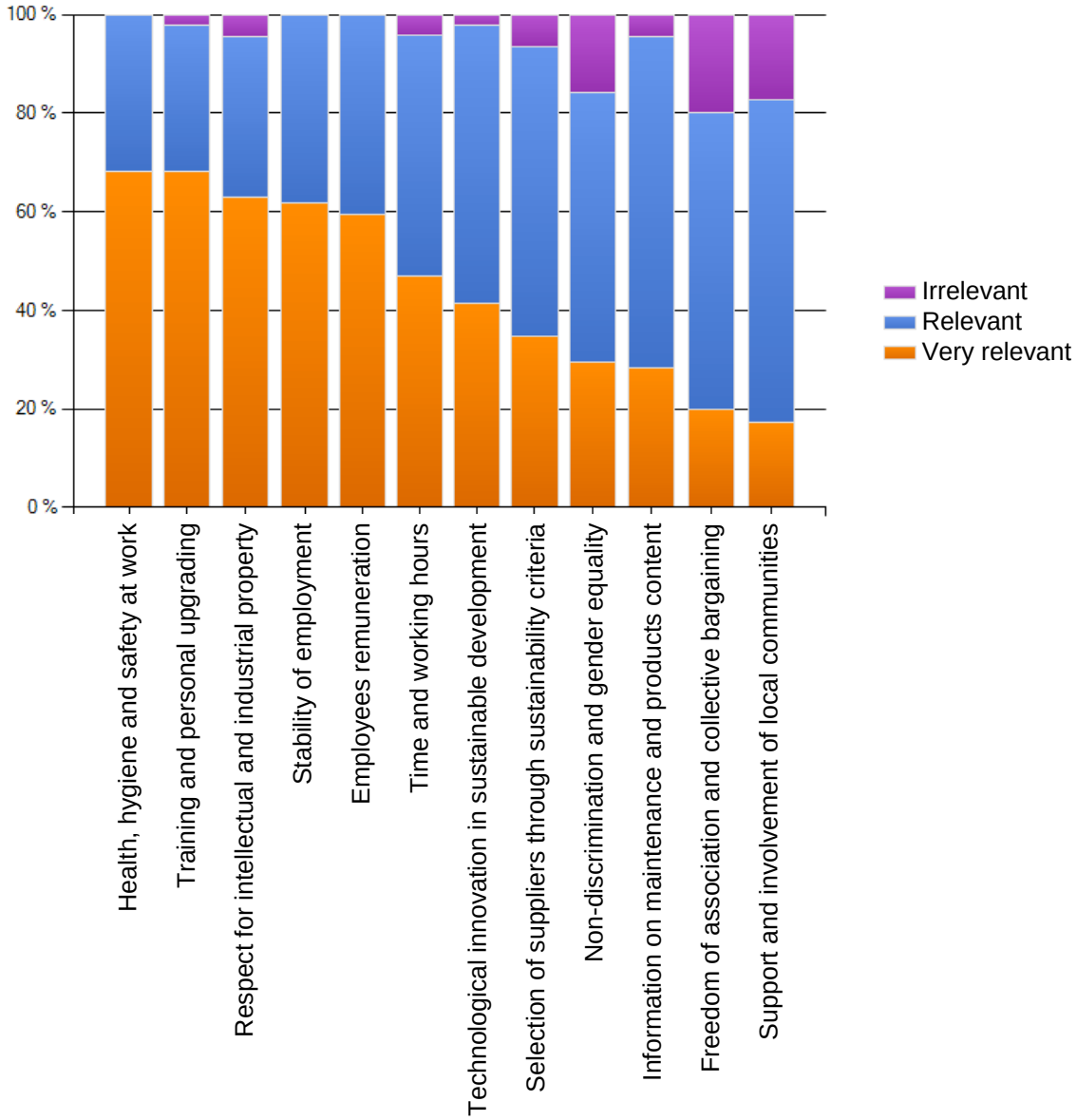

Figure 3: Social responsibility criteria identified as relevant by the furniture sector

It also represents a lack of sedimentation on the subject, which is proven by the disparity of responses obtained in consultation with the experts' panel. Indeed, the panel identified with some consensus the main problems of the sector related to sustainability, although most of them are environmental and very few are of social nature. Moreover, the panel suggests that the sustainable design tool criteria should include social criteria, but there is a great disparity among the panel when identifying those criteria.

Cross-comparisons in standards, the sector inquiry, interviews with experts and literature review did not allow the design of a solid body of strategies on social criteria with the same level of development of the environmental part. This would cause an imbalance between the two areas that would affect the ability of decision making and commitments.

Nonetheless, two other problems remained. The few selected social criteria from the scope of the designer were too vague, and there was no confirmation of their relevance to the sector, as the responses in the survey were not conclusive for the whole spectrum of social responsibility. We conclude that additional work was required, particularly regarding the tools which support and aid at dealing with the strategies and their design criteria (priority list and checklist).

4. Expert Workshop

Aiming to remedy the shortcomings mentioned above, it was thought an experts workshop. The aim was to define the design strategies and their criteria in the area of social responsibility that fulfilled two requirements: (1) to be relevant to the industry and (2) needed to be under the influence of the action of the designer, either at an operational level or at a strategic level. To achieve these objectives it was necessary to define the information on which to base discussion and select the relevant areas of expertise.

4.1. Work base

In a previous analysis of several existing standards in the area (see Table 1), we have reached a pre-selection made by the two standards that have revealed a higher bandwidth range, detail and breakdown of core issues and their criteria: the Portuguese Standard 4469-1 - Management Systems of Social Responsibility (IPQ, 2008) and ISO 26000 - Guidance on Social Responsibility (ISO, 2009). After a more careful comparison between the two, the research team chose the ISO 26000 because it incorporates all relevant aspects and explains in detail each issue. Then, in a macro analysis of ISO 26000, the categories were seen, from which we confirmed that it should be removed the part of governance and environment, once the first does not refer directly to the design practice and the second was already addressed. Within the remaining categories (Core Subjects), to enable greater efficiency in the discussion, and based on knowledge of the first tasks taken (literature review, survey and interviews) the pre-selected criteria were as follows:

Human Rights

-Human rights risk situation

-Discrimination and vulnerable groups

-Civil and political rights

-Economic, social and cultural rights

-Fundamental principles and rights at work

Labour Practices

-Employment and employment relationships

-Conditions of work and social protection

-Social Dialogue

-Health and safety at work

-Human development and training in the workplace

Fair Operational Practices

-Anti-corruption

-Fair competition

-Promote social responsibility in the sphere of influence

-Respect for property rights

Consumer Issues

-Fair marketing, factual and unbiased information and fair contractual practices

-Protecting consumers' health and consumer safety

-Consumer service, support, and complaint and dispute resolution

-Education and awareness

Community involvement and development

-Community Involvement

-Education and culture

-Employment creation and skills development

-Technology development and access

-Wealth and income creation

-Health

-Social Investment

4.2. Expert selection

To achieve the proposed objectives the research team needed to assemble an expert panel representative of all areas relevant to the topic: furniture designers, furniture companies, trade association, ecodesign experts, experts on social responsibility and experts in design research. In addition, there was an effort to involve all stakeholders, having been invited several companies that represented different sizes and contexts and the various designers who worked inside and outside companies. The main association representing the sector (AIMMP) was also contacted in order to get a macro view on the sector. However, due to various constraints, the association could not be present and the experts panel was resumed

to one furniture company, two designers, a ecodesign specialist, an expert on social responsibility and an expert in design research.

4.3. Discussion

Despite these limitations, the panel was gathered during an afternoon, was briefed and a structured discussion based on the issues of the pre-selected ISO 26000 was conducted. In the course of discussion and reflection on various topics, it was possible to determine which would not be relevant to the industry or outside the scope of design, making then not applicable to the toolkit. It was also possible to determine that several criteria were not fully applicable or directly applicable by designers, but could be used in selecting suppliers or that would only be within range of the design if it were used at a strategic level.

Given the purpose of obtaining information that could be embodied in various design strategies and criteria, the discussion was deepened within each applicable criterion.

In the Human Rights Core Subject, the issue "Human rights risk situation" was considered not applicable because it concerned more dramatic situations. The issue "Discrimination and vulnerable groups" was considered applicable at both operational and strategic level. This because in this sector, there may be gender discrimination and designers can choose to work or not with these companies and may also influence the choice of suppliers that provide good practice.

The issues "Civil and political rights" and "Economic, social and cultural rights" were considered not applicable directly, but that would still be within reach of designers indirectly through the selection of suppliers that meet standards of social responsibility.

The issue "Fundamental principles and rights at work" has been determined applicable on a strategic level, but was included in the core subject of the labour practices.

On the Core Subject Labour Practices, the issue "Employment and employment relations", which is related to the employment relationship, was determined as applicable because the designers can intervene to maintain the internal know-how, skills and experience of workers by integrating these features in the project and thus reinforcing the link between workers and company. The issues "Conditions of work and social protection" and "Social dialogue", as related to work schedules, rest periods, holidays and other social security guarantees were not applicable because they were considered outside the scope of design. The "Health and safety at work" issue was considered applicable both on strategic and operational levels. At a strategic level, the designer can influence the company's strategy by defining and implementing best practice standards in this area, despite the lack of compliance, which can occur by workers of the implemented measures. At the operational level, the designer can choose materials and processes that pose less danger. The "Human development and

training in the workplace" issue was considered applicable as the choices of project may require or encourage new training or innovation.

On the Fair Operational Practices, the "Anti-corruption" issue was considered applicable since there are various forms of misconduct: bribery, conflict of interest, fraud, influence peddling, etc. To strengthen this point, the designers should follow the Code of Professional Conduct set nationally by the Portuguese Association of Designers in accordance with an international document defined by ICSID / ICOGRADA / IFI - International Design Alliance. The "fair competition" issue was considered not applicable because it could only be checked on the enterprise level. The issue "Promote social responsibility in the sphere of influence" was considered too vague and redundant with the category development of society, and therefore was not applied. The "Respect for property rights" issue was accepted as both the designer and the company are not allowed to copy others work and must register their own work.

On the Consumer Issues Cores Subject, the issue "Fair marketing, factual and unbiased information and fair contractual practices" was accepted as the designer works for and with the area of marketing and advertising. Thus, the designer can develop good practices and develop communication supports that promote sustainability, such as maintenance manuals and assembly / disassembly information on products. The issue "Protecting consumers' health and consumer safety" was accepted since the decisions taken at design stage can influence aspects such as: the surface treatments selected may or may not contribute to the passive emission of toxic particles into the indoor environment, the ergonomics of the pieces and the existence of sharp edges, the development of parts that can be used by people with limitations (inclusive design). The issue "Consumer service, support, complaint and dispute resolution" was considered not applicable because warranties and technical support are outside the scope of design. Here, design can only have an indirect influence through the use of strategies for disassembly and durability, which the environmental section of the existing tools already address. The issue "Education and awareness" is applicable through the company communication, like environmental product declarations information or catalogs mentioning that the product was made according to certain criteria and explaining their benefits or giving tips on maintenance and end of life of the product.

On the Core Subject Community Involvement and Development the issue "Community Involvement" was considered applicable since the designer can select raw materials and local suppliers and may encourage the preservation of cultural background through the use and reinterpretation of heritage and traditional incorporation in the project. The latter is shared with the next two issues. The issue "Education and culture" is applicable since the

design activity can stimulate the differentiation and identity to face the neutrality of globalization. The issue "Employment Creation and Skills Development" was regarded as applicable, since, in addition to the above in the category of working practices, this sector represents a strong element of employment in local communities. The issue "Wealth and Income Creation" was considered applicable, but overlapping with the issue "community involvement" in regard to selecting materials and local suppliers and job creation. The issue "Health" was considered not applicable, because in addition to what can already be done by the design selecting processes and less harmful materials to health and local ecosystems (which is addressed in the environmental part of the tools), the rest is too vague and relates to public health issues, particularly in cases of countries with low rates of development. The issue "Technology Development and Access" was considered applicable given the possibility of design to foster development and introduction of technology in furniture, such as the use of home automation, lighting systems and other information technologies. These foster the development of knowledge in employees, suppliers and local communities. The "Social Investment" issue can be applied by developing projects that leverage the expertise and resources of the company to repay the local community.

The treatment of the information described above resulted in a set of strategies and criteria appropriate to the sector in study as shown in Table 2 and available to join the SDF Toolkit.

These five design strategies and associated criteria, should allow greater balance between different areas of influence in the development process of furniture products, promoting a more rational decision-making, which in turn will enable the implementation of more conscious commitments integrated into a global vision. This will be tested and validated through the implementation of SDF Toolkit in enterprises.

Table 2: Design strategies and criteria for social responsibility (part 1 of 2)

CRITERIA PER DESIGN STRATEGY	Details
DESIGN FOR HUMAN RIGHTS PROTECTION	
Do not use child labour	Internally or for Suppliers selection, verifiable through CSR Standards compliance
No gender discrimination	Internally or for Suppliers selection, verifiable through CSR Standards compliance
Respect for civil and political rights	Suppliers selection, verifiable through CSR Standards compliance
Respect for social and cultural rights	Suppliers selection, verifiable through CSR Standards compliance
DESIGN FOR FAIR LABOUR PRACTICES	
Promote the utilization of internal skills	Integrate skills of workers on the project to strengthen their ties to the company
Promote the development of new skills	Design choices that foster innovation and new training for human development
Promote health and safety practices	Design choices that contribute to promote health and safety
Select less hazardous processes	Propose and select processes safer for workers
Select less hazardous materials	Propose and select materials that are less toxic and hazardous to workers
Select suppliers with good health and safety practices	Suppliers selection, verifiable through Standards compliance
DESIGN FOR FAIR OPERATING PRACTICES	
Follow professional code of conduct for designers	Work according to principles of professional and conduct
Respect industrial and intellectual property	Do not copy or otherwise usurp the authorship and intellectual property
Proceed to the registration of design patents	Register through the design or patents in countries where it is marketed

Table 2: Design strategies and criteria for social responsibility (part 2 of 2)

DESIGN FOR CONSUMER ISSUES	
Develop responsible marketing strategies	Engage in positive actions in marketing - informative, educational and honest
Develop responsible communication supports	Communication that allows an informed purchase and a correct use
Develop educational communication supports	Communicate the criteria underlying the product, tips on maintenance and end of life
Develop responsible advertising	Do not develop misleading or biased advertising
Develop manual for assembly / disassembly	To promote correct assembly and disassembly without damaging the product
Respecting the precautionary principle	UN Declaration - Rio 92
Use high ergonomic standards	Products that are easy, comfortable and not cause injury during use
Using principles of inclusive design	Products that can be used by all, namely people with disabilities
Use principles for safety in use	Safe products for domestic use. Attention with specific groups like children
Prevent passive emission of toxic substances	During use, as the case of formaldehyde, harmful in enclosed places
DESIGN FOR COMMUNITY INVOLVEMENT AND DEVELOPMENT	
Select local suppliers	Contribute to the development of the local community
Select local raw materials	Contribute to the development of the local community
Promote the differentiation of identity	Incorporate local references as a way to cope with the neutrality of globalization
Foster the use of local skills	Incorporate knowledge of local industries and artisans
Promote the preservation of cultural heritage	Incorporate and reinterpret the traditional heritage
Foster technological development	Develop and incorporate technological advances, both internally and by the community
Develop projects of social investment	Utilize company resources (waste, HR, ...) to return to the community

5. Conclusion

Designers can and should play an important role in the integration of social criteria in the design process at both strategic and operational level. Their choices can influence the company's operating performance, for example, in terms of health and safety practices at work, by creating value for the company stakeholders, in terms of consumption patterns or influencing local development.

In this sense, the creation of design strategies and criteria in social responsibility is an important step in the operationalization of sustainable design. Although the ISO 26000 standard was developed from the perspective of organizational management, the results of the theoretical exercise presented here indicate that the principles of the standard can be translated into design strategies and criteria. However, these still require validation due to their complexity and transversality nature.

By using a focused approach in the furniture industry and selecting the relevant criteria to this sector has enabled their analysis and reconstruction to a practical reality within the reach of design. This approach also allowed the integration of design practices that are already taking place outside the framework of sustainable design, as is the case for inclusive design.

Acknowledgments

Teresa Vedeirinho, Marketing Relations/A&D at Steelcase, Portugal

André Castro, Sénior Designer at Almadesign, Portugal

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