Managing Design and Ergonomics at the Macro Level – The Design Policies

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Abstract. This paper brings an overview of a part of a proposed Course of Managing Design and Ergonomics (from macro to micro levels that we assume to be a desirable elective course to the Design Doctoral Program at the Faculty of the author, from the University of the author. Thus, the paper will explore specifically the approach to be done to the management of Design and Ergonomics within it at the Macro level. The knowledge on these issues allows students to have a broader perspective on its management, one that includes the design (and within it ergonomics) participation and impact in terms of national and global strategies. Until know the academic approach to these issues is done by Design Management and ergonomics management as separated issues that are strictly focused on the business level and sometimes it expands themselves to the project management (what is known as "operational level" at the business design management stage). With the proposed approach to the curricular unit we hope to enrich students' perception and knowledge about design and ergonomics influence in the world and the way it can be planned, monitored and evaluated at distinct stages of its intervention. The main reasons behind the choice of this topic are: (a) the fact that the contents to be taught in this context normally are not disseminated in Design Education; (b) the circumstance that this is a PhD course in which broader approaches and understandings are necessary to support better framing and critical perspectives about the Design discipline its relationship with ergonomics and its intervention in the world.

Keywords: Design management · Managing design and ergonomics
Design education

1 Introduction

This is a short approach to the management of Design (including ergonomics) at the Macro level presenting the concept itself and the way it can be useful to students especially the ones at the PhD level. The knowledge on the issues integrating the macro scale of managing design and ergonomics allows students to have a broader perspective on managing Design, one that includes the design (and within it ergonomics) participation and impact in terms of national and global strategies. Among the aims of the course there is one of making PhD students aware and knowledgeable about the broadness and nature of design impacts in the world being ergonomics one of the key issues to pay attention to. During the course, there are going to be unfold the main subtopics

considered to be determinant at this level of design's intervention. By doing so we intend to give students the possibility of identifying the key elements of this territory of action including the agents, strategies and methodologies that make part of this system in which design is both an agent of change and subject of the change.

1.1 Course Context

In general terms, we propose to exist three intertwined approaches that structure the knowledge in this specific area: (a) Design (including ergonomics) as a strategic tool at national levels and its management at a global point of view; (b) Design and ergonomics at the business level and (c) Design and ergonomics at the process/project level.

Managing Design (including ergonomics) at the macro level is a specific lesson designed to be taught in the 5th week of the course's calendar. It follows lessons related with the acquaintance with key concepts of management and design management as well as with an overview on the relationship design and ergonomics management have with specific issues such as information and knowledge management or innovation management. Thus, it is important to understand the structuring of the course that is here represented by the diagram on Fig. 1. If students do not have any previous contact with any of the three areas its processes and context of interventions, they should familiarize themselves with them not only as separated topics per se but mostly in its interrelationship thus being able to have an ample and trustful vision of the socio-political-economical context of design nowadays. The proposal of this course takes place in a context where in one hand, we acknowledge the increasing complexity of the design process and a progressive shortening of the time to complete it. In another hand, there is a paradigm change in economic development of developed and underdevelopment countries which become dependent on the production of innovative products and services with higher added value. Furthermore, social and cultural issues experienced an increase of importance in the last 20 years and the so called social design as well as the sustainable design are assumed by western governments as central topic on their agendas. Therefore, the main objective of this course is to enable students to better understand, reflect upon and operate in this complex context and to develop research with an ampler and accurate perspective of Design and ergonomics intervention in the world's innovation.
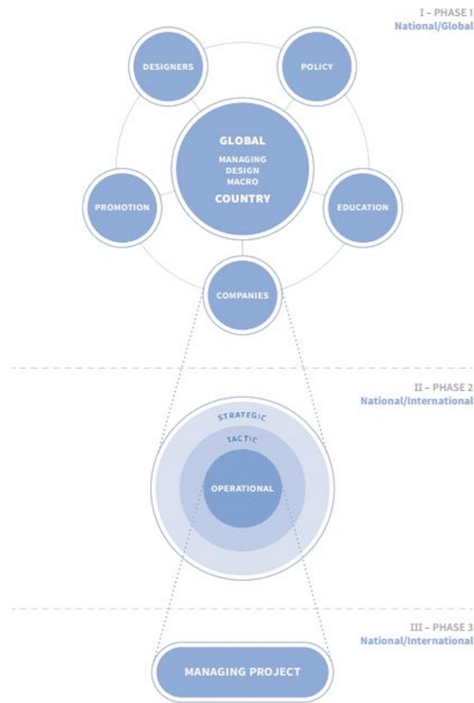
Fig. 1. Diagram of the managing design course with its phases

2   Managing Design (and Ergonomics Within It) at the Macro Level

The structuring of the complete lesson is twofold including both a theoretical and a practical approach to the contents. This didactic option is related with the necessity of making knowledge more 'visible' to students since they can use the theory and apply it. This is done using exercises that are not focused on this paper.

2.1   Theoretical Approach

The theoretical approach will confront students with knowledge about the concept of managing design and its relationship with ergonomics as a key aspect of the design thinking and process at the macro level and the importance it has at the PhD education level. The main topics to be addressed are: design policies, its management and the contribution the topic can have to PhD research (the topic addressed in this paper); Design world rankings (DWR) and its relationship with design policies; structuring elements of DWR; DWR potential contributions to PhD research; Global and National Studies on design and ergonomics' macro contributions.

2.2   Practical Work

The practical work aims to give students the chance to operationalize the knowledge taught; there is an exercise to be developed in group. In general terms, the practical work has a component to be develop in class and another one to be done outside classes. Regarding the work to be done in class it has do to with the structuring of the tasks to be done; the selection of supporting bibliography and case studies as well as the critical discussion of the contents to be developed. This work will be supported by several tools (prepared matrix and forms to help collection and structuring of information) to be provided by the teacher to students.

3   Managing Design (MD) at the Macro Level - What Is Meant by MD at the Macro Level

Managing Design at the Macro level refers to the management of Design assumption and use (real and potential) and the role ergonomics has in it in the wide context here represented by regions, nations and the world. It has to do with acknowledging the contribution of Design (taking into account the key contribution of ergonomics) to the nations and world's shaping, its role as a player, a facilitator or even an engine of societies' transformation and development. The Design Leadership Board, an organism created in 2011 at the European level that aims to boost design use at European level, defined a set of cultural, social and economic values (see Fig. 2) that should support design intervention at this level that we believe to be better implemented if the key role of ergonomics is to be carefully and fully assumed.

Fig. 2.   Design system is based on cultural social and economic values [1]

In a closer look to each of the value dimensions we clarify the role of design in cultural terms as one that should celebrate diversity and identity; that should tap into continuity of culture and heritage, that should promote synergy through complementarity; furthermore and in what concerns design vision and actions these must consider social equity as an enabler of a sustainable and inclusive growth pursuing the achievement of higher life quality - Here ergonomics are an essential element while contributing

to the quality of life; Finally design actions must be resource responsible, effective, efficient and accountable revealing a true commitment with ethics professionalism.

4 The Importance of Acknowledging MD at This Level in the PhD Education

The importance of design policies knowledge and its framing derives from the awareness that such knowhow enables students at different formation levels to understand the role of design and within it of ergonomics at a macro-global level. Moreover, to understand the world design rankings and the way they are structured gives the designers and the ergonomists and design researchers the ability to situate the discipline´s intervention in societies. Learning who, why, when and how regions, countries and global structures manage design is of key importance to PhD students in Design independently of their research theme and focus. For those that have topics not so close to this area of knowledge it allows a more thorough understanding of the net of connections and interrelationship design establishes in the economic, social, technological, legal, political and cultural dimensions of societies; on the other hand, for those who have closer approaches to this area of knowledge it allows them to have a more grounded and informed background on the historical and contemporary actions of design and ergonomics at this level. Furthermore, to study these issues makes all designers more aware of the ethical importance of design and ergonomics intervention in the world. It gives them a broader perspective of design implications in world's modeling thru a comprehensive decoding of the macrolevel structures that rule societies.

5 Design Policies (DP) as a Managing Design Topic

5.1 What Is a Design Policy

Has Patrocínio [2] acknowledges there are authors using the terms 'design policy', 'design promotion', and 'design promotion policy' as equivalents [3]. However, he defends the idea proposed by Bourn [3] that design promotion refers to an 'action', while design policy relates to a 'principle of action' what implies that design promotion integrates design policy.

If we look at the Cambridge dictionary a policy is "a set of ideas, or a plan of what to do in particular situations, that has been agreed officially by a group of people, a business organization, a government, or a political party" [4]. Moreover, if we seek a definition on a business specialized dictionary such as business [5] dictionary the terms come together with procedures (pointing to the direct connection the concept has with actions) and the definition is: "A set of policies are principles, rules, and guidelines formulated or adopted by an organization to reach its long-term goals and typically published in a booklet or other form that is widely accessible. Policies and procedures are designed to influence and determine all major decisions and actions, and all activities take place within the boundaries set by them. Procedures are the specific methods employed to express policies in action in day-to-day operations of the organization.

Together, policies and procedures ensure that a point of view held by the governing body of an organization is translated into steps that result in an outcome compatible with that view."

Important to attain from both definitions is the idea of formalized plan meaning that some activities are designed to occur in an interval of time. Additionally, and coming from the business definition of policy we clarify the specific need of having actions to be taken that imply major decisions to be taken in a limited and well-defined territory. However, some elements are missing on these two definitions: the fact that policies have a strategic nature; and the specific reference to the stakeholders involved and the fact that they have explicit and shared responsibilities in designing and implementing those policies.

There is still a stricter definition such as the one proposed by Bourn [3] that defines a policy as "the translation of government's political priorities and principles into programs and courses of action to deliver desired changes." Bourn [3] designed a circular model for policy-making that integrates three phases starting with design, followed by implementation and finishing in maintenance that are operationalized in four key steps from planning to assessment (see Fig. 3).
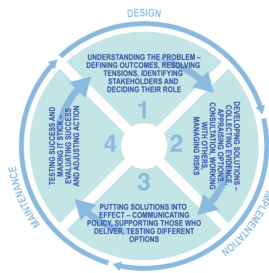

Fig. 3. Bourn model for policy making [2]

In the case of Design policies, one can also mention the generic definition of Gisele Raulik-Murphy [6] that proposes design policies to be understood as strategies defining the vision and directions adopted by a country in terms of its understanding and use of design. Moreover, it is important to present the DeEP definition of Policy since this organism is the one responsible for monitoring the European existing policies. In their view: "Policies are the way in which a Political System shares a set of rules, activities, and processes necessary for the transformation of existing conditions into preferred ones." [7], and "Design policies aim at sharing a set of rules, activities, and processes to support design through the reinforcement of design capabilities at all levels of the policy cycle (The policy cycle is a conceptual model describing the stages involved in making policy and its cyclical, iterative nature. There are many variations in the number and types of activities within the cycle – for DeEP the used stages are:1 – agenda setting; 2 – policy formation; 3 – policy adoption; 4 – policy implementation; 5 – policy evaluation" [8].

This definition introduces another key concept related with design policies which is the design capabilities that are strictly linked to the organization's level of design

management. In this case, they give respect to the "capabilities set needed to carry out design activities. Capabilities are recognized in three macro areas as it can be seen in Fig. 4.

(a) Design Leadership, (holistic view, how people give meaning to things) is encountered when design participates to the strategic choices of the firm/organization, so that a design-driven innovation strategy is the core activity carried out through a people centered approach being ergonomics a key issue;

(b) Design Management, (visualizing/materializing, managing the process) is the ability of managing design resources, in terms of human resources, design process (and ergonomics within it) and creativity, economic resources;

(c) Design Execution (applying new technologies) involves the presence of human resources with technical skills, design and ergonomics technologies and infrastructures, investments in the NPD process [8].
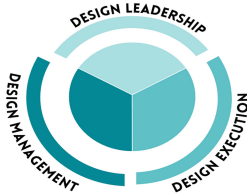

Fig. 4. Design capabilities [9]

Each of these is divided in one or more specific skill to detail the focus of the area. In a closer look to design policies' literature it is impossible not to notice its intimate link to innovation policies and there is a strong desire in Europe to assess the impact of such policies by the creation of frameworks and indicators to evaluate all actions – from macro scale (regional, national, European) to micro (specific initiative) - thus allowing a comprehensible picture of its impacts. That close connection can be observed in the creation of The European Design Leadership Board (established in 2011) that has issued a set of recommendations on how to enhance the role of design in the innovation policy in Europe at the national, regional or local level trying to promote a joint vision. Taking a broad-based view of design, they identified 21 policy recommendations grouped in six areas for strategic design action as it can be seen in Fig. 5 [1].

Fig. 5. Recommendation for growth and prosperity through design intervention [1]

Important to notice in the diagram of Fig. 5 the broadness of areas and stakeholders involved in the process. The development and implementation of a design policy thus implies the coordinated and articulated intervention of the government – normally through the ministries of industry and/or economy) of the public and private agents dedicated to the promotion, execution, regulation, normalization and support of industry and technology namely in the sectors of production and education. In general, the use of design (and ergonomics within it) at the national/global levels is accomplished because it exists the vision shared by all part involved in the process that it is a creative and innovative process able to generate sustainable and efficient solutions to specific problems, which have a key importance not only to the production, technological and economic areas but also to the social, environmental and cultural fields. The vastness of the design policy study includes the possibility of learning how countries establish their goals considering factors such as: research and education, design and ergonomics as professions; companies and industries; public sector, general population and international public. This is also the view of Gisele Raulik Murphy that has written her PhD Thesis with the title "A Comparative Analysis of Strategies for Design Promotion in Different National Contexts" in 2010 [3] in which she concludes that:

- The competitiveness has been the main rationale for design policies being intimately linked with economic goals and visions;
- There are different agents involved in design policies such as: initiatives by individuals – introduce design to small communities; government programs – foment the use of design by industries; official public policies – foster the use of design resources.
- Supporting design by itself is not being enough to have companies using it; It is necessary to combine it with design promotion, to support it with design education and to align it with other government policies;
- Recent trend on design policies to be more user centered and have an ethical approach rather than only benefiting economic development.

Due to its clear importance in nation's development it is than important to comprehend design policies in respect to its genesis, structuring elements, drivers and implementation modus allowing the students to relate it to different historical, cultural, political, technological, legal, social and economic contexts thus perceiving the positioning of design (and ergonomics as a key element) in each context and the influence it has in national/global strategies.

Figure 6 makes clear different stakeholders are involved in design policy design and implementation. The way they interact, their role in society and in the nation strategy differs from country to country depending on multiple factors such as culture, politics; legal framing, social structure etcetera. Finally, one must acknowledge the European effort of developing a meta structure of European design policies [10] which is called the European Design Innovation Ecosystem that is represented in Fig. 7.

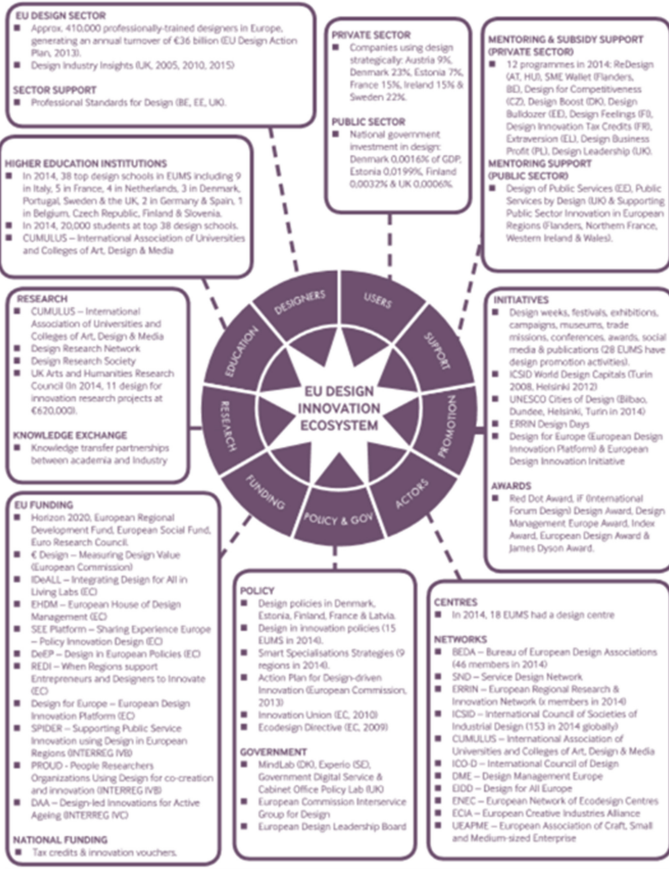**Fig. 6.** Design policy structuring elements [2]

Fig. 7. Stakeholders and initiatives in European Design Innovation Ecosystem [10]

5.2   Types of Design Policies

Different contexts call for distinct approaches. This is also the case of design policies. Moreover, there are countries that had created formalized design policies (with and without reference of the key role ergonomics plays in it) and others that didn't do it although having design programs and actions that all together can be seen as a pre-design policy. That is the case of most European countries that try to implement design programs (some in a more explicit way other in a tacit one). This state of art implies the actual lack of evaluation that results in less effective design/innovation policies that must be studied not only in what concerns its nature but also regarding its national perform-ance and its impact in firms. If one performs a diagnosis about design policies around the world it is identifiable that different countries generate different policies with distinct goals. In general, there are two approaches: one more economic oriented; another more wellbeing oriented, both requiring an ergonomic approach that is fundamental. There are countries (specially the more developed ones such has the Nordic) that use design as a booster of life quality; other countries make a stricter use of design policies focusing on industry development and performance (it is the case of BRIC countries in general). As stated in DeEP report [11] countries like the Netherlands have implanted design policy within industrial policy hence there are a limited number of particular design policies; Belgium displays embryonic but growing design initiatives although the impact of such initiatives remains to be determined; Some smaller countries like Malta and Cyprus, have little or no policies related to design nevertheless they have good design-related businesses; Sweden and Denmark enjoy high levels of trade, exchange of design-related activities, personnel and resources further strengthening an already well-defined policy. Generically it is observable in all design policies the existence of design programs aiming at the increase of national companies and industry and services competitiveness however the role of ergonomics its far from being well defined. Such focus excels from the set of developed countries as well as from other countries that have a precise need to boost its national competitiveness A closer look to the work developed by Raulik Murphy and Cawood [7, 12–14] allow us to understand the diver-sity of policies and ways of engagement among stakeholders that are best acknowledged using visual diagrams such as the ones presented in Figs. 8, and 9 for example.
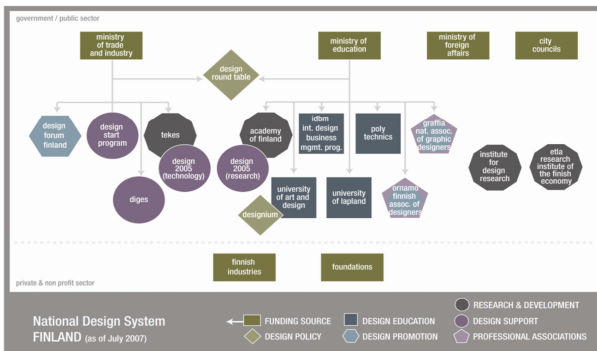

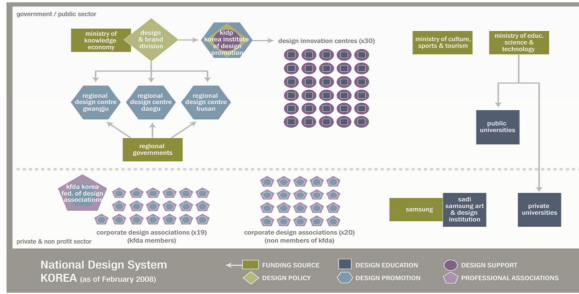**Fig. 8.**   National Design System Finland [14]

Fig. 9. National Design System Korea [14]

The analysis of the different country diagrams designed by Raulik Murphy and Cawood [14] shows as the most relevant fact the distinct role of the government in comparison to the non-profit/private sectors in the chosen four countries. As seen in Figs. 8 and 9 the governments in Finland and Korea play a key role by defining strategies and financing design policy and programs. Otherwise in Brazil and India (which diagrams we didn't present here) it is visible the absence of public funds being design programs mainly independent self-guided initiatives. As a direct consequence, there is a difference with more private/non-governmental initiatives seen in India and Brazil compared to Korea and Finland. Additionally, leadership and integration are clearly more defined in Korea and Finland in comparison to the developing countries, which may be a result of the key financial role played by their national governments. Regarding the way different design policies perform it is also central to refer the design policy monitor 2015, a publication dedicated to review innovation and design policies in Europe since Europe seeks a convergence of European countries policies to have a competitive benefit of a joint action. In this document, some trends in Europe to be developed until 2020 are anticipated such as: Policy-makers across Europe will integrate design more holistically within innovation policies as well as smart specialization strategies and some will develop design action plans. Governments will seek to build design and ergonomic capabilities with small and medium-sized enterprises by integrating design and ergonomics as an eligible cost within innovation programs such as mentoring, subsidy, tax credit and export schemes as well as developing dedicated design support programs. Governments will develop their internal capacities for design-driven innovation by training staff in design and ergonomics methods, employing design managers and establishing multi-disciplinary innovation units. Public sector administrators will recognize design (and ergonomics within it) as an enabler of innovation in multiple policy domains such health, social, environmental, digital and transport policy and as a method for inclusive policy-making. Besides the study of Design Policies (DP) the study of Design World Rankings (DWR) is a very relevant element along with other governmental and nongovernmental studies about this macro presence and use of design. Unfortunately, we have no space to develop the topic that integrates this approach to managing design at the macro level.

6   Conclusions

This paper stresses the importance of Managing Design at a macro level stressing that the key role of ergonomics usually is absent from this approach and presents design policies as one of the topics that can help students to understand this level of design and ergonomics intervention. The main conclusion of the study of these issues (design policies, design world rankings and other macro studies on design performance and use) is that having a holistic view on how design (and ergonomics within it) affects and is affected at the macro level benefits student's understanding of the broadness and deepness of design and ergonomics intervention in societies. A second immediate conclusion one must be aware of is that the vastness of issues raised with this singular topic calls for the study of numerous subjects ranging from economics to education. Thus, it is essential to promote a lesson (following one in which these issues are presented to students) in which case studies are offered to make evident some of the aspects taught and explained.

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