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Systemic Design approach in policy-making for sustainable territorial development

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Abstract: The era of transition that we are experiencing need a radical change also in the structure of society. This must be reflected in **political commitment** to find a new structure of rules able to facilitate **participatory** processes and to support initiatives than can bring social innovation. For this reason, cooperation between design, technology, economics and sociology is fundamental. As the society is currently undergoing a profound change it is necessary that the policies outcome from a commitment arising from a **multidisciplinary team**.

An example of coordinated work between universities, local authorities, government offices, associations, public bodies is the RETRACE project (Systemic Approach for Transition towards a Circular Economy). RETRACE's aim is to drive EU policies applying the SDA (Systemic Design Approach), which means by using the output of a system as an input of another system. Applying CE to define a strategy in order to look forward to a regional development allows to reach fundamental social benefits: "[...] the circular economy will offer a number of societal benefits for European countries not least in terms of carbon emissions reductions and job gains" (Wijkman, Skanberg, 2015).

Keywords: Systemic Design, Policy Design, Retrace

1. Introduction

The contemporary era is characterised by radical technological, economic, cultural and social shifts. As we are experiencing a changing period, since the role of design and designers is always broader, we need, as designers, to make also our application areas broader. Design in last years has changed in a very deep way, the systemic model, compared to the linear one, involves many disciplines and leads to more complex scenarios. The designers of the new generation went further. They increasingly have proved to be ready to accept new and stimulating challenge. The focus is not only product, not only services and processes, not only social and environmental systems, but also policy-making. As designers, the definition of pattern, frameworks, models and intangible is exactly where our challenge lies. Designers are supposed to know to 'think outside the box'. This is the skill that we are required to use in the process of policy development: to respond creatively to complex problems. Complex problems such as, for instance, the ones that policies aim to solve.

Social, cultural and environmental changes that we are experiencing need to be reflected in political commitment to find a new structure of rules and containers that are able to facilitate participatory processes and are able to support initiatives and projects than can bring social innovation. This is the reason why the, cooperation and the development of disciplines such as design, technology, economics and sociology are fundamental to harnessing a team able to find innovative solutions.

Prof. Mark Considine, Dean of the Faculty of Arts at The University of Melbourne, concludes his article titled *Thinking Outside the Box? Applying Design Theory to Public Policy* with the identification of 8 propositions that underline the “conditions and characteristic elements likely to distinguish a creative design expertise from other decision-making attributes” (Goal emergence, Pattern recognition, Anticipation, Disruption, Emotional engagement, Fabulation, Nonconsistency, Risk protection) (Considine, 2012). From this research derive specific features about the way designers work and the thought-process that belong to the designers which are useful and effective to undertake a policy-making path. Not only creativity, probably the most recognized and approved feature that belongs to the designers, but also the capacity to recognize patterns and to read complex environments, the capacity to visualize unexpected future states, and to promote openness and surprises.

2. The abilities of designers

“At IDEO, a ‘design thinker’ must not only be intensely collaborative, but ‘empathic’ as well as have a craft to making things real in the world. Since design flavors virtually all of our experiences, from products to services to spaces, a design thinker must explore a ‘landscape of innovation’ that has to do with people, their needs, technology and business.”

(Brown, 2006)

In this time of changes, designers must explore new issues and develop new ability, he must be able to make things simple and to create connection, or put to the service of new fields the skills that have always characterized him, such as creativity. Below is a deepening of 3 of the basic skills that characterize the designers.

2.1 Make things simple, from complexity to richness.

The first characteristic of designer is the ability to make things simple, in order to make things more easily managed and to make exchange of information possible. In this sense design become important to create better information tools in order to foster:

- Information exchange: to help people understanding by creating human-centered information materials
- Information accessibility: to help people, in our case policy makers, to use in a better way the huge quantity of data collected in the analysis phase of the process/project. Data should be transformed in something understandable from end-users and, first of all, from policy makers.

This capability makes possible to reach the creation of communication tools but also community-based strategies to creating knowledge-sharing networks.

2.2 Creativity

Creativity cannot be considered a new and innovative ability of designers. Creative process links creativity to the ability to develop new problem descriptions to enable new solutions. But this

feature, if applied to other fields than the usual, such as policy-making, becomes able to generate innovative solutions. In this sense, design become itself a tool. Design is a tool useful to link and connect creativity and innovation, able to guide innovative ideas to become practical solutions for social innovation. Applying design methods and design thinking to design policies, the tool is no longer the design, but the designer himself, as a methodology expert, as an expert of processes, in this case, intangible processes. Designers are able to see problems in a new light, to see solutions in a new way. This idea of design as a link between two fundamental aspects of the policies is driven by Cox Review of Creativity in Business: Building on the UK's Strengths (Cox, 2005) that represents design as a "creativity deployed to a specific end". The idea of design as a link, sometimes as a vehicle, between different disciplines and fields, is very common. It's a meaning of design already deeply analysed and studied.

"Creativity and innovation are normally complementary activities, since creativity generates the basis of innovation, which, in its development, raises difficulties that must be solved once again, with creativity...It is not possible to conceive innovation without creative ideas, as these are the starting point." (European Commission, 1998). In a discipline manner, creative thinking plays a key role in innovation.

2.3 Creating connections

Not only creativity, as written before, a very important a capacity that belongs to the designer is to create connection in complex systems, to offer a wider look on the problems.

As systemic designer, connections have a central role into the design process. Our projects are based on interconnection built between the elements of the system, in order to generate new business activities, new products and new relations. From these connections comes the sustainability of autopoietic systems. The designer is required to think to new connection, to work within multidisciplinary team non only for designer that deal with the definition of social systems or services, but also for designers of tangible products. We could speak about "trans-disciplinarity", instead of "multi-disciplinarity". As it is well described in Introduction: Futures of transdisciplinarity, in 'trans- disciplinarity' there is the involvement of a transgression or transcendence of disciplinary norms, sometimes 'the pursuit of a fusion of disciplines, an approach oriented to complexity or real-world problem-solving (Lawrence, Després, 2004). What we call multi or inter-disciplinary is no longer an optional choice but a necessity. We are experiencing a reality in which boundaries between different disciplines, between different capabilities and roles are always more interconnected. We could say that designers have to create an environment able to foster connection between different disciplines, between business, engineering, environment, social sciences and, of course, design.

3. Policy Design

As written previously, design is no longer necessary a product or a service. Always more we consider the aim of the design process itself the applied way of thinking, the shaping of decisions. One of the fields in which design has now assumed an important role is policy making. The policy-making process is a problem solving process. Policy defines processes. "Policy making is the process by which governments translate their political vision into programs and actions to deliver 'outcomes' - desired changes in the real world" (Blair, Cunningham, 1999).

Policy making has to deal with complexity, it's a complex issue. Today we are required to solve complex problems that involve several aspects. This is why it become necessary to find creative

approaches that allow people involved in the research of solutions to look at the context more broadly. Design Thinking (DT) can be used to approach these complex issues.

Design policy is based on the application of design methods and DT in particular in order to extend to a new level design methodologies and use them for the policy planning. Design thinking can be used to solve complex problems. In policy making processes many programs are developed by different stakeholders and actors. To face this kind of complexity it is now necessary to use creative and structured innovation processes and approaches.

“Designers must be taken seriously by policy makers”. This is what the team of the Education for Policy Design Synthesis (EPDS) claims Babitch, Fort, Kasemkosolsri, Kim, B. Nelson, 2005). This report reflects how fundamental is to put together design skills and approaches with policy knowledge in order to reach the aim of developing innovative solutions to public problems.

‘Having worked with hundreds of organizations to design products, services, and environments, we believe true innovation happens when strong multi-disciplinary groups come together, build a collaborative culture, and explore the intersection of their different points of view. [...] We believe having designers in the mix is key to success in multi-disciplinary collaboration and critical to uncovering unexplored areas of innovation. Designers provide a methodology that all parties can embrace and a design environment conducive to innovation. In our experience, design thinking is the glue that holds these kinds of communities together and makes them successful’ (Stanford Institute of Design). At the Stanford’s “d-school”, the Stanford Institute of Design, they argue that design thinking is the effective language to dissolve disciplinary barriers. Design thinking can be described as a discipline that uses the designer’s sensibility and methods to match people’s needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity (Brown, 2009). Moreover, DT is defined by Design Sojourn’ as “a thinking process that anchors your decision making with multi-disciplinary influences.”

3.1 Design with, not for

Participatory processes and bottom-up processes are fundamental in design thinking. For the definition of policies it is usually applied a top-down approach that rarely includes final users and citizens, during the definition phase. Therefore cooperation between different professionals (designers, technicians, economists, sociologists, housing developers, community-based organizations that assist low-income residents, policymakers) (Mauldin, 2014).

DT, bottom-up design, human and user-centered design, co-design, participatory design have in common the bottom-up approach and the active involvement of users in the designing process. As Lorenzo Allio describes very clearly in his paper *Design Thinking for Public Service Excellence* (Allio, 2014), end-user needs become at the centre of the policy formulation system, creating a new decisional process.

It is very useful to refer to several case studies to understand what practically means PD, which the values are, how design approaches applied to policy making become strategic to reach social innovation. The common objectives of these case studies are to find user-driven innovation and new tools for policymakers and to develop design policies as a key support for business and public sector.

These objectives are central for European Commission and become always more important in last years. This is witnessed by the large number of programmes and initiatives launched by the

European Commission that put design at the centre of the definition of new strategies to reach innovation.

- The European Commission founded in 2011 the European Design Innovation Initiative (EDII) that aims to “raise awareness of how design-driven innovation increases efficiency in public services and drives business growth create capacity and competencies to deliver these policies.” (ec.europa.eu). With the aim to support the uptake of design in policies, under this programme there are: IDeALL (Integrating Design for All in Living Labs), EuroDesign – Measuring Design Value, DeEP – Design in European Policies, SEE Platform: Sharing Experience Europe – Policy Innovation Design, EHDM;
 - European House of Design Management, REDI: When Regions support Entrepreneurs and Designers to Innovate.
 - Chelsea Mauldin, executive Director al Public Policy Lab (2011): design strategies to tackle public policy problems. The lab helps Americans build better lives by improving the design and delivery of public, it is a non-profit dedicated to improving public services through design services. PPL works with a very interesting process. There are multiple phases of work, the whole process is divided into 3 phases (discovery, design, piloting&evaluation). Design in this process is collaborative-design. This phase is guided by end users, service providers and policy makers. One of the examples of the importance of the application of design thinking, human-centered research and collaborating design in policy making process is the collaboration between the Public Policy Lab and Parson DESIS Lab within the “Public & Collaborative: Designing Services for Housing”. Within this project a real collaborative process has been activated. Including tools as small-team interviews, on-the-street interviews, design workshop and usability testing session (Mauldin, 2014).
 - The Action Plan for Design-Driven Innovation (2013) build on the report Design for Growth on Innovation (2012).
 - Design for Europe (2014), a web platform that underlines and collects case studies, guidelines and tools as the main outcome of a 3 years programme to support innovation development by design across Europe. Design for Europe outcomes from a partnership, led by the Britain Design Council, of 14 subjects including universities (Lancaster University, Birmingham City University, Politecnico di Milano), design centres (Danish Design Centre_DDC, Estonian Design Centre), an innovation foundation (Nesta), a regional business development agency (Invest NI), a Business and Cultural Development Centre (KEPA), an agency for innovation and research (Luxinnovation), a multi-disciplinary lab composed by designers and social scientists (La 27e Region), an innovation policy and reserch institute (ARC Fund), the European Network of Living Labs (ENoLL).
- Design for Enterprises (2016), launched by European Commission to drive design methodologies in order to model new businesses. This programme offer free training courses to SMEs to improve competitiveness throw design-driven innovation.

4. Systemic Design (SD) approach to support the transition throw circular economy

“Systemic and inter-connected problems need systemic and inter-connected solutions.”
(Brown, Wyatt, 2010)

Policy planning aims to solve complex issues. Complexity is strictly linked to systemic concept. The world around us is a complex web of relationships connecting people, companies, and countries, into a system that provides the context for our daily existence. Given this complexity, it is hard to imagine

any interesting problem that can be solved in isolation, it is imperative that our policies at all levels (local, regional, national and international), intended to regulate such systems, take into consideration this richness. Complex systems define a class of problems that are often described as non-linear (the whole is greater than the sum of its parts), adaptive (both the system and its constituent parts adjust over time to the changes in the environment, within the system, and within the components), self-organizing (components self organize without central direction), and emergent (it is hard to anticipate the system outcome of interventions carried out at the component level) (Hadzikadic, 2015).

The systemic vision is what characterizes systemic designers, what allows them to investigate problems broadly and develop territorial systems after the definition of the Holistic Analysis.

For policy makers, incorporating SD and a holistic view of the state of the art, would support the creation of more efficient policies effective for a transition towards a Circular Economy (CE).

The achievement of a sustainable, low carbon and resource efficient and competitive economy is led, within European Commission, by considering CE as an essential objective.

This is clearly shown by the Action Plan that the EU has defined. Moreover, the EC points up that “the transition to a circular economy is a systemic change” (Europe, 2007) and wants to support initiatives that follow this path. The Horizon 2020 work programme 2016-2017 includes the “Industry 2020 in the circular economy”. This initiative aims to support with over €650 million the projects that make innovation a priority.

The approach of Systemic Design can help business and policy makers to this transition to CE and to find innovative solutions to reinvent and shape economy, making it more sustainable.

5. Retrace Project

The RETRACE project, “A Systemic Approach for REgions TRAnstitioning towards a Circular Economy”, developed by the Department of Architecture and Design at the Politecnico di Torino won an Interreg call focused on the promotion of cooperation within a network of 5 European partners: Italy, France, Spain, Slovenia and Romania. The project will last four years (2016-2020) and will mobilize a total budget of around € 1.5 M. The project aims at promoting systemic design as a method allowing local and regional policies move towards a circular economy when waste from one productive process becomes input to another, preventing waste being released into the environment. It addresses the EU challenge of transitioning towards a CE following the priorities set up by the “Flagship Initiative for a Resource-efficient Europe” for a shift towards a resource-efficient, low-carbon economy to achieve sustainable growth as enshrined in Europe 2020 strategy and the EC Communication “Towards a circular economy: A zero waste programme for Europe”.

The SD approach, developed by the research group of the Department of Architecture and Design at Politecnico di Torino, seeks to create complex industrial systems. It aims to implement sustainable productive systems in which material and energy flows are designed so that waste from one productive process becomes input to other processes, preventing waste from being released into the environment. RETRACE partners deem that the adoption of more systemic approaches at territory/regional level can play a leverage effect in such transition.

The main expected outputs and results of the RETRACE project are:

- The development of 5 regional/national Holistic Diagnoses (HD). The HD is divided into 3 steps, we are currently completing step 3.
- The identification and exchange of 30 Good Practices in 5 target policy areas.
- The holding of 7 interregional exchange of experience activities with the participation of 182 stakeholders and partners.
- The engagement of 5 regional/national stakeholders groups all along the exchange and strategic thinking process leading to the definition and implementation of 5 Action Plans.
- The outreach of politicians and policy-makers with specific activities and publication for increasing the ownership of process at target policies and RIS3 level.
- The issue of policy recommendations and road map for the adoption of method and good practices by other EU regions.

The methodology that we are following is the definition of the HDs, the selection of 30 Good Practices with a focus on the policies behind the good practices, the identification of the gaps of the good practices and the research of policies than could solve and combine with the gaps find during the analysis.

5.1 Social Impacts of RETRACE

The RETRACE project aims to raise awareness on CE and SD among regional politicians and policy-makers, as well as between industrial and business sector and society, in the tangible benefits for a transition towards CE. The learning process plays a central role. Within the project the Interreg Europe Policy Learning Platform on Environment and Resource Efficiency has been studied as an important tool for this purpose.

Fundamental is also the involvement of citizens and people sharing CE and SD culture at a local level. This is why open events and social media are key points of the project: Regional and Interregional Dissemination Events and social media (website, Twitter, YouTube Channel).

The project also aims to involve the stakeholders in each phase, from the very first ones, the local stakeholders as an important part of end-users of the Action Plans that have to outcome from the project. Stakeholders have in the RETRACE project a fundamental key role. They must be informed in a properly way because they should become the subjects that share knowledge with their networks. So, the stakeholder of the RETRACE project is on one hand one of the final users of the policies defined into the Action Plans and, on the other hand, the actor that should share knowledge about CE and SD at a local level with their own networks.

The 3 abilities that belong to designers (Make things simple, Creativity and Create connection) are fundamental for the development of the project:

RETRACE, MAKE THINGS SIMPLE

As written before, the main objective of RETRACE project is the definition of 5 Action Plans with good policies. The first phase of the project is the one that requires a greater effort. It is the phase of the analysis of the 5 territories involved in the RETRACE project. So, on the one hand we have the analysis of the territory itself, able to highlight the potential of the territory from the economic, social, cultural and environmental point of view, on the other hand we have selected the GPs and, above all, the effective policies able to support a sustainable economic growth. In this challenging phase of the project, as systemic designers, we have a fundamental responsibility, which is precisely related to its ability to *make things simple*. It is about, in fact, managing a large amount of data, often not homogeneous, coming from different sources, collected for different purposes. It is a set of disconnected data, a set of elements that do not talk to each other. Our goal, at this stage, is mainly aims to turn this set of separate elements in a system of elements.

As far back as 1916, the Swiss linguist Ferdinand de Saussure, in his posthumous work "Cours de linguistique générale", defined the system as "an organized whole, made up of supportive evidence which can only be defined in relation to each other, according their location in this totality " de Saussure, 1913). Here, the capability of systemic designer to make things simple is practically translated into the metabolization of this very large number of data elements in an inter-related system, in a system that speaks of territory analysed, in a system that can tell us about the "soul" of the territory in a system that can be managed and used.

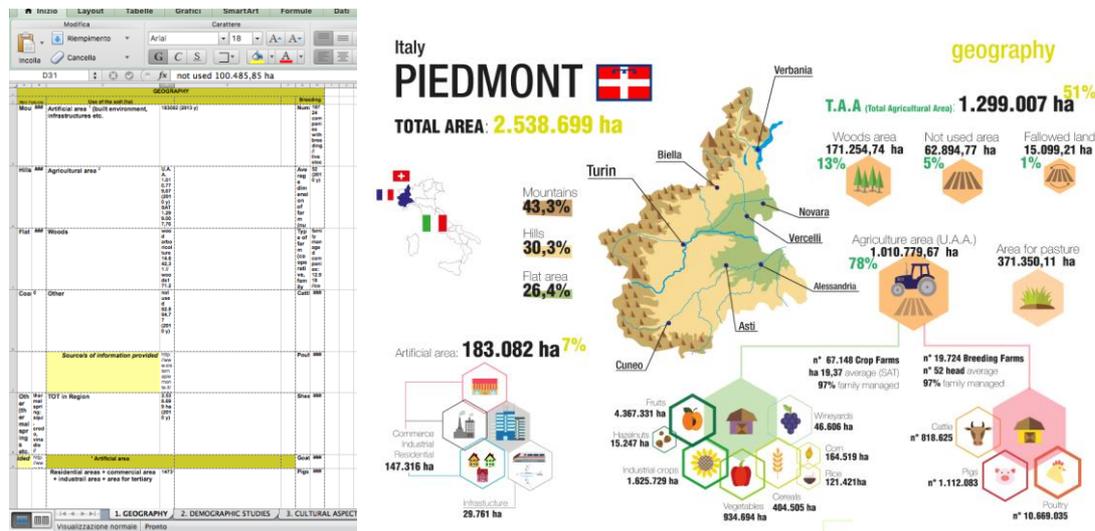


Figure 1. The large amount of data has been simplified to facilitate the management of these data.

RETRACE, CREATIVITY

Creativity: the ability to see problem from different points of view, in a new light. It is undoubtedly the principal designer of the characteristic for which you choose to place in a designer team working in a policy-making process in all cases that have been previously described and in many others. The importance of creativity in this process is demonstrated by the key role design plays in RETRACE project: the project coordination. Designing policies for the territory means, in essence, to plan the future of the territory and, therefore, design the territory itself. The challenge to which we are called is precisely achieve this objective. As previously written, this goal cannot be achieved without entering deeply into the territory in which you work in partnership with those who, better than anyone else, knows the territory: local people. Creativity is needed to extract or, rather, to emphasize and highlight, what can be called the “soul of the land”, not only its characteristics related to environmental or economic resources. This is not the place to discuss and write about the meaning of the term "creativity", which, of course, we may long dwell. According to Boden (1998), creativity could be divided into three types: the “combinational” creativity, able to reach new combination of well-known ideas; the “exploratory” creativity, new ideas explored within structured concepts; the “transformational” creativity referred directly to the structure, mainly the capacity to define new structure (Boden, 1998). The complexity of the concept of creativity explains why this is the current capacity and the designer's characteristic that is required throughout the project. Creativity explains why design has a so central role within RETRACE.

RETRACE, CREATING CONNECTIONS

The project aim to reach to 5 regional Holistic Diagnoses with assessment on the potential connections and synergies of the territorial natural/environmental assets of the 5 target region, the systemic links of 3 priority industrial sectors to their regions and a self assessment on policy gaps. During this process the exchange of information and experiences is a central part. Therefore, connections between actors are fundamental. This is exactly the meaning of the policy instrument: the strategic approach is based on the exchange on different methods shared between partners to tackle a systemic approach for a Circular Economy strategy for the region.

What is required to the designer in order to define policy instruments is to generate exchanges in order to create connections between good practices, policies, territorial and cultural characteristics. Or, better said, Set-up systems to identify synergistic opportunities at cross-sectoral level. One of the most relevant phase of the analysis of the RETRACE project is the identification of policy gaps and potential opportunities upon which to build supportive policies: all partners will update the matrix resulting from the Holistic Diagnoses, matching policy gaps with exchanged Good Practices to identify those most promising to their interests.

This is what practically means creating connections.

RETRACE_ PARTICIPATION

We can assume and consider as end-user of the RETRACE project the stakeholders. Stakeholders are required to play a responsible, active and constructive role in shaping decisions. They should participate to groups all along the exchange and strategic thinking process leading to the definition and implementation of 5 Action Plans. Stakeholders are active subjects of the project and they involved in each phase, from the analysis (phase 1 until April 2016) to the implementation phase 2 until March 2020). Specifically the stakeholders are involved in the project at different steps and to achieve several objectives: they participate to the Stakeholders Group Meeting (tot. 6), to Regional

Dissemination Event, they work together to identify regional Good Practices, to define the Holistic Diagnosis. Moreover they participate to a Field Visit in a foreign country.

6. Conclusions

Applying the methodologies and approaches that belong to the design for the definition of policies for a sustainable future is thus a consolidated practice and well proven. The RETRACE experience shows that, for an effective transition to a circular economy, a transition which is not exclusively focused on recycling and focused on the product and on the reduction of waste, apply the Design System approach can be an effective solution. This indeed, means not simply closing the famous circles of production, finding alternative destinations of waste to landfills. The goal is to shift the focus from the product to the territory. To conclude, the design goes a step further in an effort to define new policies through the design of the whole territory.

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