COLLECTIVELY DESIGNING SOCIAL WORLDS

History and Potential of Social Innovation

Carla Sedini

D.I. DESIGN INTERNATIONAL
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Acknowledgments

This book arrives late. But maybe this is the right time.

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Introduction

This book results from several years of research, during which I brought social research theories and methodologies in design research projects. More and more, the pieces of research I have been working in took into consideration sustainability issues and social innovation. After about ten years, I concluded that nowadays, innovation could not be other than social.

Social innovation is a concept that entered our everyday language already several years ago. However, as it often happens when a word is commonly used, it lost its original meaning, even "winking" at liberal entrepreneurial solutions. This book can seem somehow a step back to the definition of innovation and social innovation, identifying specific areas of interests and stakeholders; in particular, I will identify design roles and methods in dealing with social issues, especially from an academic point of view.

But what is innovation? The Schumpeterian approach provides a starting definition, which looks at innovation as a new combination of known elements; it is a non-repeatable process because it happens thanks to the actions of the creative but isolated entrepreneur (Schumpeter, 1934). Later on, Schumpeter defined innovation as a "*process of industrial mutation, that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one*" (Schumpeter, 1942: 83), as it is going to be discussed later on. The improved concept is less focused on the role of a lonely and isolated entrepreneur, who does not have to be one person but can even be the country itself and its innovation agenda (Śledzik, 2013).

From this, a new growth theory has been developed. According to the Neo-Schumpeterian approaches (Hanusch & Pyka, 2007), the innovation process becomes repeatable; technological, social, and cultural environments become essential factors in developing creativity and innovation.

Four distinct elements can be identified to define different typologies of innovation, which are not exclusive.

First, innovation can act on processes devoted to developing a product, a service, or – in general – a solution; these processes can change and can be improved.

Second, innovation can regard the solution itself, that is, to ideate a novel or improved product or service.

These first two typologies are the most common and known in the definition of the concept. However, other two very relevant typologies of innovation exist.

Third, innovation needs to be disseminated to be really so. As an entrepreneur, a maker, an inventor, etc., a solution that is not diffused and available to other people (in the market but, in general, in the world) cannot be called "innovative". The last sphere that can define innovation and which is strictly connected to the previous point is the value that this solution creates: is there only an economic and market return, or is there some other positive impacts that this solution generates? The value and the impact of the solution is another relevant typology of innovation to be taken into consideration. The last fourth sphere that connects innovation with its value and its impact helps to go beyond a view where the concept of innovation has mainly to do with technological improvements. First of all, technology is not innovative in itself, but the use and the purposes of its implementation can be innovative; secondly, there is a standard view of technological innovation as mainly related to digital improvement and transformation. However, works of (collective) ingenuity, such as the wheel or the movable type printing, are entirely part of the definition of technological innovation as well. Going back to the first point, technological innovation can allow innovation in other fields of society, as it is going to be discussed in this book. From a historical point of view, innovation has always existed. However, it changed (and changes) its goals, targets, areas of interest, and applications according to the different needs and challenges that societies had to face. Schumpeter, who can be considered as one of the principal scholars dealing with innovation, in the forties, defined innovation as new goods of consumption, new productions, new means of transportation, new markets, new forms of industrial organization created by capitalist enterprises (1934, 1942). This connection between capitalism and innovation is particularly important, and it relies on Marx's previous works (Marx & Engels, 1848; Marx, 1857; Marx, 1863). As David Harvey compares, "*Both Karl Marx and Joseph Schumpeter wrote at length on the 'creative-destructive' tendencies inherent in capitalism*" (Harvey, 2010: 46). Schumpeter introduced the concept of creative destruction to describe

the innovation process and defined it as the incessant product and process innovation mechanism by which new production units replace outdated ones (Schumpeter, 1942; Caballero, 2010). Marx did not explicitly use the term creative destruction, but he focused on processes of accumulation and annihilation as characterizing capitalistic societies. Indeed, as Marx argues, "*Capitalism, […], destroys the old pre-capitalist economy 'and constantly revolutionizes it'* [1973, p. 410]" (Elliott, 1980: 48). The adjective "creative" has a positive meaning, which is related to the creative generation of something new that did not exist before or that it was different, but this creativity is self-destructive. Changes and improvements have an impact on what it was the *status quo*, on the hitherto known and used process; this means that, at the microeconomic level, innovation process leads to changes within the market, and through the competition between firms and sectors, it generates both profits and losses (Christensen, 1997). Therefore, innovation causes *creative destruction* processes, typical of capitalism, which undergoes, in Marx's view, to continuous moments of crises and self-destruction.

The approach proposed in this book looks at innovation as a process that can confront the negative externalities, the contradictions, and the unsustainable effects of capitalism and liberal approaches to the market. For this reason, as it is going to be discussed in chapter two, we can talk about social innovation since it is (or should be) rooted in the different components of sustainability, which are environmental, social, and economical. One of the most popular definitions of social innovation, provided by Mulgan looks at it as "*innovative activities and services that are motivated by the goal of meeting a social need and that are predominantly diffused through organizations whose primary purposes are social*" (2006: 146); however, as it is going to be presented in chapter two, several definitions of social innovation have been provided. Social innovation can both be a process or a product; in the first case, when social innovation is a process, it depends on individual creativity, organizational structures, and environmental context able to positively influence its attainment. When social innovation is a product of an innovative process, the "*attention is focused on the outcome of social innovation, and how this is manifested in social change, in this case, more sustainable forms of community development*" (Baker & Mehmood, 2015: 323). Nilsson (2003) defined social innovation as a "*significant, creative and sustainable shift*" (ivi: 3) from previous problematic situations to more desirable conditions. The two adjectives "creative" and "sustainable" are both very critical. For this reason, I will address both in this book, trying to define creativity in the light of innovation practices and sustainability in a strict connection with its possible manifestations within society.

This book adopts a multidisciplinary approach to eviscerate social innovation as a concept with its foundation in theoretical, political, and methodological domains. Principally, the present discussion will be based on sociology and design; the first will mainly define the theoretical framework of reference. The second will mostly deal with experimental and applied research dealing with social innovation. However, the two cannot be separated due to my personal background and have to be seen as an essential *unicum*.

In the first chapter, the operative definitions of creativity and innovation will be provided; these concepts are used both in everyday, academic and entrepreneurial discourses. It is important to historically and methodologically frame them to understand how they are culturally defined and how they can influence our cultures. At the end of this chapter, an initial focus on design will be provided, since it has often be associated both with creativity and, more recently, with innovation.

In the second chapter, I will focus on those social facts and changes that influenced the emergence and the popularization of the social innovation concept. We will see how the issue of sustainability is strictly connected and cannot be separated from it, and theoretical foundations of it will be presented. Urban areas will be the main context taken into consideration, as they constitute the places where these changes mostly occur, but also because they are privileged places for the activation of processes of social innovation; in fact, research centers, decision-making powers, places of consumption (and often of production) and civil society are concentrated in them. I will address Universities and specifically Design Universities as important agents for the activation and the persecution of social innovation processes.

Design and consumption have always been strictly connected, and in the third chapter, they will be analyzed in light of their approach to sustainability issues. Designers and consumers can be agents of change in order to address sustainability and social innovation. In this chapter, sociology and design theories are interrelated and sustain each other. In particular, I will provide clarification on the design field in connection with the issues previously introduced and explained: sustainability and social innovation. I am aware that the concepts and theories here presented could be already known to designers; however, I think there is no comprehensive understanding of design outside the "design world". Design is commonly connected with the beautification of objects or places. Rarely people outside the "design world" are acknowledged on the existence of a long tradition of studies and research in the design field(s) that not always have to do with the production of the objects. The last section of this

chapter will focus on participatory approaches, which since the 70s, and increasingly in recent times, have been presented as essential actions in design applied research, especially when they address social issues.

The last two chapters will present two research projects that I have been working in during the last years and that can explicitly explain the relationship between design, design research, and social innovation. The fourth chapter, which I wrote with Laura Cipriani, Stefano Maffei, Massimo Bianchini, and Mirko Gelsomini, will present SISCODE research and the pilot project BODYSOUND, which deals with Patient Innovation. Co-design processes with and for children with cerebral palsy have been implemented and will be the chapter's main topic. The fifth chapter, which I wrote with Xue Pei and Francesco Zurlo, will present LONGEVICITY research, which deals with a type of innovation focused on senior citizens' involvement in urban planning processes.

In the conclusions, in light of the reference literature and the research experiences presented, the Grounded Theory's methodological approach will be proposed as preferable in the research processes that see the involvement of different stakeholders as an important moment in the planning for social innovation. The concept of *well-being scalability* will also be introduced, based on the principle according to which improvements in the quality of life of a specific category of people can promote improvements in the quality of life of other subjects and populations to whom the design solutions do not directly address. Finally, questions will be asked about the future that social innovation co-creation processes may have in light of the recent health emergency.

To conclude this short introduction, I want to quote Pievani (preface in Wilson's book "Le origini della creatività"). The scholar states that discovering that we have a common origin and we as members of societies face common issues can give importance to what binds us, not to what divides us. The global problems that humans will have to face require that far-sightedness that only a convergence between the scientific community and the deeper humanism values can generate. They require the ability to imagine better and more just alternatives.

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1. Creativity vs innovation? A matter of culture

What is the difference between creativity and innovation? According to Legrenzi (2005) creativity is something that attain to a singular person while innovation is a collective phenomenon; that is why creativity has been often studied by psychologists while innovation was mainly studied by economists. However, this is one of the possible definitions. Indeed, these two concepts have been often used as synonyms, and the collective side of creativity has been explained and studied by several historians, sociologists, but also economists, and designers. As it is going to be discussed in this section, especially at the end of the XX century, the word creativity became very popular in describing innovation carried out within the economic and political sectors, especially at the urban level. Creativity is no longer defined by its relationship with personal inspirations or genius as in the traditional Romantic model; on the contrary, sometimes, this "umbrella" includes any kind of activity. This topic has become very fashionable, and it has been used in several disciplines to describe fields of economic production, urban politics, and the actions of the social actors.

The discussion, therefore, shifted from the creative capacities of individuals to the creative capabilities of places, demonstrating the importance and the need for an (eco)systemic and cultural approach to the issue. Nowadays, the boundary between creativity and innovation is blurred because of the *software* and cognitive characteristic, making the first similar to the second and vice-versa (Legrenzi, 2005). However, this mutual approach to art and science, to creativity and innovation, is not something new as I am going to discuss.

1.1. Individual and collective creativity

As Charles Landry explains, creativity is an overused concept, difficult to define, and often associated only with artistic matters (2000). Creativity is not just the skill of producing new and singular ideas and objects, but also an aspect of intelligence characterized by an original way of thinking and solving problems (Kunzmann, 2005).

In different theories and disciplines, the concept of creativity has gone outside the boundaries of artistic production, becoming a kind of intellectual inclination in economy, politics and technological innovation inside big cities.

Edward de Bono defines creativity as a "*messy and confusing subject*" (in Kunzmann, 2005: 2); the product of creativity is not always obvious or simple, in most cases a creative product, to be defined like that, must be unique and rare. If we agree with this view, it is clear that the unique character of creativity makes this concept almost antithetical to that of innovation.

Psychologists, in the past, gave a lot of attention to the topic of problem-solving. I can mention the Gestalt Theory studies, conducted by Max Wertheimer (1959) or the Lateral Thinking presupposed by Edward De Bono (1971). Geir Kaufmann (1991) gives some insights into the definition of this concept. Creative thinking requires:

- the "*modification or the rejection of previous accepted ideas*" (Kaufmann, 1991: 105);
- high motivation, persistence, and relatively long periods of time;
- to formulate the problem itself if it is vague and ill-defined.

Herbert Simon (1986), for example, explains that creative actions are those that produce something original, interesting or that have a social value (Santagata, 2004); but, as Gregory Bateson affirmed, "*nobody is ingenious, dependent or fatalist in emptiness*" (1984: 326). Indeed, creativity could be conceived in an absolute sense, but its manifestation is related and happens in the tangible world. For this reason, creativity is deeply connected and influenced by temporal and spatial dimensions (Testa, 2005).

The necessity of taking creativity to a tangible level and dimension also requires a discussion about the transformation which society has passed through. Koestler (1964) distinguished between cultural creativity and individual creativity by using the concept of "ripeness", which has to do with maturity and development at the right time. Indeed, he noticed that

the most creative societies occurred in periods of redefinition and understanding (of current situations), such as for example of Classical Greece or the Renaissance (Sill, 2001); however, also periods of crisis, such as the one we are going through right now, in 2020 with the COVID emergency still present, have potentialities for being creative. Thinking of chaotic, uncertain and complex periods, it is possible to refer to post-normal times (Sardar, 2010; Montuori, 2011) and post-traumatic growth (Tedeschi and Park, 1998). Even if the second concept (post-traumatic growth) has been mainly used to talk about individual trauma and artistic creativity, it can also be collectively applied to groups and societies (Fuentes, 2017; Fredrickson, at al., 2003). The collective dimension of creativity (and innovation), devoted to facing a crisis, can be generally associated with the concept of resilience[1]. Indeed, "*Investing in city resilience is the best defence against crisis. Creativity enhances resilience*" (Girard, 2011: 57). Folke *et al.* (2010) even talked of Resilience Thinking as a thinking process addressing complex social-ecological systems' dynamics and development (SES). The connection between resilience, social innovation, and urban areas is going to be presented in chapter 2.

In the XX century, creativity became very popular and crucial in economic discourses, as if creativity did not exist before or as if it was something relegated only to an ethereal dimension, detached from the economy. This is questionable since creativity has often been developed where (economic and social) resources were available. Those resources were also used to commission big works of art, as, for example, in Florence, where neighborhoods of artists and artisans were close by those of bankers. After a period of separation between art and culture from the economic life of nations and cities, during the last decades the conception of creativity surpassed the boundaries of artistic production to become a kind of intellectual inclination in economy and politic and in the innovation field inside urban contexts; this led for example, to political interests and attention paid to strategies which would be able to make of one city a Creative City (Landry, 2000).

Trying to address the relationship which occurs between creativity and innovation concepts, it seems important to me to quote the description given by Margaret Boden: "*Creativity is the ability to come up with ideas or artefacts that are new, surprising and valuable*" (2004: 1). In her definition, she talks about ideas and artefacts that not necessarily include only art as we define it but also every aspect of life, in particular human intelligence.

1. www.psychologytoday.com/us/blog/tracking-wonder/202006/how-creativity-builds-resilience-in-times-crisis.

Figure 1 - Chill or Rage by LUKAS BERGE. Street art in Budapest. CC BY-NC-SA 2.0 Carla Sedini

1.2. Creative and innovative cultures

Without denying the importance of a particular stance and motivation, I intend to refer my analysis to the concepts of culture and knowledge in order to take some distance from an ethereal vision of the so-called creative people and from a definition of creativity as a kind of intelligible mystery. As it has already been observed above, the word 'culture' is quite elusive, and it can have different meanings; from an anthropological perspective, culture is a set of beliefs, traditions, and ways of living for a specific society or of a group of people. From another perspective, from the perspective of Allen J. Scott (2000), culture is strictly connected to specific knowledge and the possession of skills that a group of people could share (Landry, 2000). The work of Pierre Bourdieu is very useful for developing this aspect. In his writings on art, the author put the artistic production and the concept of culture in a strict relationship, outlining the guidelines for a sociological theory of artistic perception. He affirmed that studies that define the artist as a person who has an individual intellectual predisposition, a personal disposition, and sensitivity, do not take the cultural aspects of the creative act into account. In particular, Bourdieu stresses the importance of cultural agents in determining the intellectual field. Indeed "*the relationship between a creative artist and his work, and therefore his work itself is affected by the system of social relations within which creation as an act of communication takes place, or to be more precise, by the position of the creative artist in the structure of the intellectual field*" (Bourdieu, 1969: 89). What is shown to be a natural inclination to the arts is actually something living in the social and cultural conditions of individuals' lives. In this sense, the relationship between creativity, innovation, and culture in its sociological meaning is made explicit.

Max Weber thought that human beings were cultural beings. He stated that thoughts, the system of law, and morale were products of society's economic conditions. Values and beliefs were able to orientate people's behaviors and, in this way, influence the event courses. He highlights the cultural factors which had a role in the birth of capitalism with other economic, social, and political factors. In this view, culture is a kind of method, a concept that is useful when we want to categorize a phenomenon we would like to understand. In Weber's view, culture is not only tradition, as in anthropology, but it is also innovation and implies an active role of ideas. Ideas are created by individuals and social

groups, which might have conflicting interests (Sciolla, 2002). In this view, ideas can become grounds of confrontation and mediation between different social groups and their opposed interests. In Bourdieu's words, in fact, culture is not what an individual is, but what an individual has or better, what he/she has become. The idea of an innate culture or of a gift of nature cannot be separated from the lack of consciousness of the role institutions have in perpetuating and diffusing culture. To this end, Bourdieu develops the concepts of habitus and field (1985). The concept of habitus is borrowed from scholarly philosophy and from philosophers like Hegel, Husserl, and Mauss. It is defined as the collective unconsciousness of a social class and results from a long-term inculcation process that starts from childhood. The concept of field is founded on the fact that social actors do not act in a vacant environment but in concrete social situations, which are governed by several social relationships, as previously stated. Then, from one side there is the individual creativity and the unmistakable nature of every man and woman; from the other, there are the multiple correlations between culture and society, so that the quantity of social and cultural independence from the others and from a community can or cannot favor creativity (Nowotny, 2006). In line with this view, Santagata stated that "*culture matters not only because it represents the anthropological image of the material, spiritual and social life of people, but also because it is a basic resource for sustainable economic growth*" (Santagata, 2004: 2).

Inside a given social environment and cultural background, three forms of creativity could be possible. The first one is related to make new connections and combinations between familiar ideas. The second concerns the exploration of conceptual spaces.; this means that inside a structured style of thought in any disciplined way of thinking that is familiar to a certain social group (Boden, 2004), creativity appears in the form of new possibilities which could be developed despite the limits. This second form has to do with the potentialities which had never been taken into consideration before. Finally, the third form is about the transformation of the space, not just geographical space but also mental space. This last form of creativity is the deepest one because it supposes that someone thinks something "unthinkable" (ibidem).

So how these "unthinkable" ideas can be developed and implemented?

To answer this question, we need to keep together the two concepts of creativity and innovation. In one of its first explanations, innovation was defined in a Schumpeterian approach as a non-repeatable process achieved by the new combination of known elements, which happens thanks to the creative but lonely entrepreneur's actions. From this "soli-

tary" approach, a new growth theory has been developed. According to the new approach, innovation processes become repeatable; in fact, the new-Schumpeterian approach perceives the technological, social and cultural environment as one of the essential factors which is able to influence the development of creativity and creative ideas. Commonly it has been thought not only that new ideas came up suddenly and often without the creator being aware of that (eureka! mode), but also that the mind of creative people, according to Poincaré (1982), follows specific phases in its way of thinking. The starting point for the process is the appearance of a "problem" that has to be solved or a project that has to be developed. The phases identified by Poincaré are:

- preparation: in this phase, the problem is approached with the familiar and well-known methods;
- incubation: in the second phase, the element of novelty appears in response to the unsuccessful methods of the first phase. While the preparation is only a conscious step inside the process, the incubation involves both consciousness and unconsciousness;
- illumination: even if this phase would seem to coincide with the mental lighting, Poincaré points out that it is the result of the prior two phases of the process in which the problem had been studied and thought with familiar and unfamiliar methods;
- verification or evaluation: the last one is the most conscious phase. At this moment, it has to be proven that the 'solution' which was obtained is corrected or not.

I have reported here the theory of Poincaré because it is useful to address the relationship between innovation and creativity better. Without under evaluating the specific characteristics and particularities of every single person, the focus is shifted from creative/innovative people to creative/innovative ideas and processes through which ideas are generated.

Following Hall (1998), creativity owns collective and widespread characteristics because the most brilliant people think of new ideas, and then other people (the entrepreneurs) make their development possible. This second phase of the creative process is where innovation is collocated. According to Fagerberg (2005) the first phase corresponds to invention; instead, the second corresponds to innovation. This means that innovation puts into practice what has been thought and designed. It is difficult to distinguish between the two phases, but the time-factor might help to make this distinction because they are collocated in different temporal sequences: first invention (the idea) and then innovation (the realization).

Indeed, Schroeder *et al.* (1986: 108) describes the innovation process as "*the temporal sequence of activities that occur in developing and implementing new ideas*".

These reasonings are very much framed within capitalist societies and in the economic and market domains and it assumed that creativity is the key to success of companies which run in the market saturated with offers (Chan Kim & Mauborgne, 2005); in this view, creativity is at the base of successful innovation processes. The passage from the dynamic of needs to the dynamic of desires and the creation of new desires takes place. Since the creative process is composed of three fundamental characteristics, which are readiness, expertise, and risk (Simon, 1986), what is needed in this new kind of economy to win the challenge? New skills, such as bravery, adaptability, flexibility, and obviously creativity.

In the next section, I am going to shortly present the proposed approaches to gain and develop these skills, issue of which design scholars have been really careful about.

1.3. Integrative thinking leading to innovation

According to Martin & Moldoveanu (2003) the previously mentioned skills (bravery, adaptability, flexibility, and creativity) could be gained through the learning of integrative thinking processes. Integrative thinking (Koestler, 1964; Csikszentmihalyi & Getzels, 1973; Guilford, 1968; Sill, 1996; Storr, 1991) is not a new idea. Koestler (1964) talked about "bisociation". Creativity would derive from the bisociative thinking, which is the amalgamation and integration of two different orders of ideas as a whole (Sill, 2001). Joy Paul Guilford (1968), similarly, explained how intelligence and creativity were both constituted by multiple factors so that both are a "*complex combination of thought processes*" (Sill, 2001: 297). While according to Anthony Storr (1991), creativity is the activity through which it is possible to connect separated and even opposite entities. The scientific development of an idea is also possible thanks to the formation of new links.

Roger Martin, in his book "The Opposable Mind" (2007), talked about the particular way of thinking shared by the successful managers and entrepreneurs he interviewed. People like Isadore Sharp (creator of Four Seasons Hotels), Bob Young (co-founder of Red Hat software), Piers Handling (the idea man behind the Toronto Film Festival) seem to have in common the ability to hold two opposing ideas in their mind and then synthesize them in one unique answer. The main point which differentiates the integrative thinkers from the conventional ones is that the question

at the base of their action is not "how the world is?" but "how the world might be?". "*The two types of thinking are diametrically opposed, and so the outcomes they generate*" (Martin, 2007: 48).

This view is very similar to what Norman and Verganti (2014) propose in the definition of incremental and radical innovation. According to the scholars, incremental innovation is defined by "*the improvements within a given frame of solutions doing better what we already do*" (Norman & Verganti, 2014: 5); while Radical Innovation is a change of frame, "*doing what we did not before*" (ibidem). The integrative thinker is pushed by a tension to the limitless possibilities and refuses simple and linear causalities to answer one problem. Integrative thinkers look for creative solutions. Martin explained the different approaches to thinking, talking about the personal knowledge system composed of the stance, tools, and experiences. The stance is made by the personal identity, values, and role and answer to the question: who am I in the world, and what am I trying to accomplish?

The differences between the stances could be analyzed, taking into consideration the following elements:

- goal;
- task;
- reaction to disconfirming data;
- attitude to the current model;
- behavior.

The conventional stance tends to believe that the current model is the right one, and the main task is to protect it. If disconfirming data appear, they will be repulsed. In brief, the conventional stance wastes time trying to defend the current model, and it is a very common bias. This approach is called Contended Model Defense. Instead, the integrative stance is continuously looking for possible improvements of the current model so that even if disconfirming data emerge, these are interpreted as a key to do better. Then, the integrative stance views the current model as the best available right now. But he spends time doing different things, which could help find a new and better model. This approach is called Optimistic Model Seeking. Similarly, Koestler (1964) talked about the attitude to questioning as the way to pursue valuable new ideas. This attitude is based not only on the opinion that not all answers are known but also on the idea that the current solutions are inadequate (Sill, 2001). Tools inform the personal stance.

Martin states that the main elements which compose the category of tools are reasoning, modeling, and inquiring. Indeed, the ability to ask questions about the world or, in this case, the current model, is one of the

most important skills to develop. The deductive and the inductive logic do not allow the development of new ideas because they answer only verity or falsity questions. Instead, a generative model of reasoning uses an abductive kind of logic. "*Abductive reasoning has been identified with the notions of intuition […], creativity and subconscious activities*" (Kroll & Koskela, 2015: 327; Cross, 2006; Dew, 2007).

The question is not about what is true or false, but what "might be". Martin stated that this is a Generative Reasoning because it has to do with the production of new ideas that not always can be fitted in the existing models (Martin, 2007). Another important tool that "thinkers" should have is the ability to consider non-linear and multidimensional causes to explain the problem they have to face. Causal Modeling "*and generative reasoning combine to form one of the most potent tools in the integrative thinker's kit*" (ivi: 53). Finally, integrative thinkers use inquiry instead of advocacy. Using Assertive Inquiry, it is possible to understand the models used by other people and "*then use the insight gained to fashion a creative resolution of the conflict*" (ivi: 157) between the different models. Tools guide our experiences, but at the same time, they are also modified and ameliorated, even if we usually interpret experience in a way that can confirm our stance and our tools (which is another typology of bias).

According to Hillary Austen, a consultant in the ForeAction team, the experience is the base of action, and it is the only way to reach mastery and originality in one field. "*Mastery requires repeated experiences in a particular domain*" (ivi: 181). It is almost impossible to excel in one field without having had any experience in that field. A very clear example could be the training required to be excellent in one sport or in playing a musical instrument. There is a particular stance and maybe physical and mental predisposition at the beginning of the path, but then the repeated experience is necessary. Instead, originality has to do with the "*creation of a new approach or solution*" (ivi: 183). Experience then is also collected through experimentation, prototyping, and the process of failure and success. The model presented has to be looked at as a cumulative process. A particular kind of stance is the base from which the process starts, but even if something is innate, a stance as a tool can be learned. Conversely, experiences are impossible to teach. Experience, in its general meaning, is non-transferable.

In this view, that looks at the cumulative approach as the preferrable one to be used, incremental innovation is easier to achieve and, probably, it has to be also favored in light of the acceptance of markets, which are based on specific habitus and routines of sectors and users/

consumers (Molotch, 2003; Norman & Verganti, 2014). Indeed, "*Change and conformity are thus not only both on the scene at once, and existing in the development of a single product, but exist through one another. Allowing some conformity with the past enables people to accept something new, while the innovation helps keep the old product going into the future*" (Molotch, 2003: 19). This is particularly true when social innovation is the final goal since often it insists on rooted cultures.

In the following section, in order to better frame the Design approach to innovation, I will present two main concepts: Design thinking and Design-driven innovation.

1.4. Design thinking and Design-driven innovation

Even if design is the central topic of chapter 3, where the concept is going to be more extensively addressed, I think it is important to anticipate it in this chapter to complete and conclude the discussion here presented.

Love (2000) defines "design" as the basis and the starting point for the making of an artifact, and "designer" as someone who creates designs. This definition might seem tautological, but I think that it will be clearer later on. The definition of design has always been inclusive and, especially in recent years, identifies design as a process, a strategy, even a way of thinking, more than looking like a singular and tangible output. The role recognized to design (and designers) has been that of a driver of innovation and change; this approach to design took the distance from a mere aesthetic role of design, as it will be further discussed. This broad definition allows people like me, coming from different fields, such as sociology – in my case-economy, psychology, etc. – in others, to work and study in design fields and domains. An additional and relevant definition of design is that which Verganti (2008) proposes in his studies. Referring to its etymological definition (*de-signum*) and the description provided by Krippendorff (1989), the scholar sees design as a way to make sense (of things). According to Verganti, this definition is preferable when innovation is taken into consideration.

According to the innovation consulting firm IDEO, the design thinking process relies upon three main elements:

- the Desirability of the solution, which answers the question, "*What makes sense to people and for people?*";
- the Feasibility of the solution, which answers the question, "*What is functionally possible within the foreseeable future?*";

- the Viability of the solution, which answers the question "*What is likely to become part of a sustainable business model?*".

At the core of the Design Thinking process are users/humans with their needs, technology is the motor of possible innovation, and business success is the final goal (Verganti, 2008). In the IDEO definition, especially when users are taken into consideration, making sense is still crucial. Specifically, "*innovation of meanings is incremental when a product adopts a design language and delivers a message that is in line with the current evolution of sociocultural models*" (ivi: 441). The Desirability sphere, which IDEO identified, can be compared to what Verganti calls Design-driven innovation, since here "*innovation starts from the comprehension of subtle and unspoken dynamics in sociocultural models*" (ivi: 443). Even if innovation of meanings may also be radical, in my view, especially when sociocultural models are involved, the process needs to be slower and incremental to avoid a cultural shock and, for example, to promote sustainable cultural changes, as I will discuss in the following chapter. Indeed, the innovation of meaning provides new ways to address a particular problem and new reasons (Verganti, 2016). As said, these definitions have mainly been used as strategies for companies to be innovative and successful, and meaningful on the market, identifying users' needs and responding to their implicit or explicit requests. However, the capability of Design Thinking to approach complexity, acquire different and unexpected points of view, reframe problems to be able to solve them can be particularly useful to address social issues, inside or outside the market. Indeed "*The world's increasing complexity has changed the prevailing view of design thinking, now seen as a means of salvation, due to its responsiveness and adaptability in the face of indeterminacy*" (Dell' Era *et al*., 2018: 1).

2. Social innovation as a proactive approach to sustainability challenges

In Postmodernity, the symbolic value of consumption activities became crucial in the definition of consumers' identity. Consumption becomes flexible and personalized, and the figure of the consumer hybridizes into a form that combines production and consumption activities. This shift towards greater involvement of end-users and the adoption of design strategies that leave several possibilities open is evident when applied to the social innovation field.

I will observe and analyze social innovation and sustainable consumption from a perspective that starts with the changes influencing the emergence of the concept (social innovation) and the renovate attention of users (customers, people, citizens, etc.) towards their consumption behaviors and choices. Studies on consumption practices have always been part of discourses closely linked to identity, social recognition, and a sense of belonging or differentiation. Indeed, Bourdieu (1984) describes a typology of consumer who makes "distinction" the underlying driver for everyday consumption practices. According to Bourdieu (1984: 6) "*Taste classifies, and it classifies the classifier. Social subjects, classified by their classifications, distinguish themselves by the distinctions they make, between the beautiful and the ugly, the distinguished and the vulgar, in which their position in the objective classifications is expressed or betrayed*". Through their consumption choices, consumers communicate who they are and what they think as members of a social group, often in opposition to the others', as it will deepen in chapter 3. Instead, a choice that is taken according to the theory of *antifragility* proposed by Taleb is even more conscious, so that people choose with the ultimate goal of satisfying needs and overcoming difficulties (2012). Considering Bourdieu's approach, the need for community is probably one of the aspects that characterize the most some consumption choices and which can help us understand the concept

of social innovation and its genesis. Consumers can become a market-pushing factor of change; however, this change towards more sustainable approaches or a renovate consciousness of vulnerabilities within our society requires that governments spread knowledge and information, facilitating or even forcing actions toward social issues resolution. Together with these two stakeholders (consumers and government), also designers can be drivers of change, making more conscious choices of what, how, and why they ideate and produce.

2.1. How societies change

The Modern era was characterized by collective grand narratives, which constituted identities, and which also architecture and urbanism communicated. Grand narratives were set in place by the Nation-State and then acquired also by citizens. These collective grand narratives gave way to what was defined as the Postmodern; as Lyotard stressed (1984: xxiii-xxiv) "*the term modern […] designate any science that legitimates itself with reference to a metadiscourse […] making an explicit appeal to some grand narrative, such as the dialectics of Spirit, the hermeneutics of meaning, the emancipation of the rational or working subject, or the creation of wealth […]*" postmodern is defined *"as incredulity toward metanarratives*". It has been spoken of liquidity, individualism, and uncertainty (Lyotard, 1984; 2004; Baudrillard, 1994; Bauman, 1988; 1993; 1992; Giddens, 1990; 1991; Beck, 1992; to mention just a few scholars who discussed Postmodernism or applied a postmodern approach). Bauman (2000) speaks of liquid modernity as defining a society where life took on a connotation of precarity, from all points of view, whether professional, political, and personal life. The high values were somehow betrayed and even considered dangerous, giving way to unbridled consumerism. Paradoxically, even the era of Postmodernity can today be considered concluded. Modernity and Postmodernity have left essential legacies on territories that are somehow also reorganizing and integrating, with results that are different and sometimes even conflicting. An identity crisis persists, the precarity of life, accompanied by a sort of closure, fear for one's safety, fear of the new, and the different[1].

1. Carla Sedini speech in the convention "Moderno Multiforme" organized within the series of appointments of 'Milano capitale del moderno' at the Padiglione Architettura, curated by Lorenzo Degli Esposti. Initiative organized by Regione Lombardia in collaboration with Triennale di Milano and Gi Group (October, 2015).

Globalization has been identified as the process that drove this shift, even if it is not a process that has recently started or describes only economic phenomena. Indeed, the global system of trade, travel, and tourism has a long history, but its characteristics changed over time according to cultural, economic, and technological changes. Arjun Appadurai (1990) identified five "scapes", through which the ongoing globalization process acts and is manifested. These "scapes" are flows of so-called cultural objects and are:

1. ethnoscapes, composed of people moving around the globe for different reasons; they can be tourists, migrants, students, etc. each of them owning a specific cultural heritage;
2. technoscapes, characterized by the possibilities of cultural interactions given by technological development;
3. financescapes are mainly characterized by flows of capital and money across borders;
4. mediascapes are flows of media images and communication that shapes the way we interpret our imagined world;
5. ideoscapes, are flows of ideas and ideologies formed through the combination of the other four "scapes".

We can easily notice that these "scapes" influence one another. Technological advancement has probably been the main factor in increasing the rapidity, length, and number of these interactions (Eitzen & Baca Zinn, 2012). The advent of communication technologies provokes a time/space compression and the shrinking of physical distances, influencing a significant interdependence between different parts of the world (Giddens, 1990; Harvey, 1992).

Some theories concluded that we are living in a postmodern world, while others argue that globalization has radicalized or culminated in the project of modernity. Robertson, Giddens, and Meyer and his colleagues take this latter view. For Robertson, an early pioneer in globalization theory, globalization represents the universalization of modernity. Beck, Giddens & Lash (1994) talked about a new phase of modernity, characterized by the social effects of the risks deriving from human activities. We are witnessing a greater individualization, a change of alliances in social agreements, and today determined more by the conflict over the distribution of damages rather than by a division of (innovation) benefits, and a crisis of the exclusive right of the scientific-technical knowledge in risk assessment. As damages are concerned, Beck (1992, 2009) talks about World Risk Society. It is characterized by different typologies of risks

Figure 1 - Italian immigrants arriving at Ellis Island in 1905
Lewis W. Hine, 1905 - Original publication: Photo-study Immediate source: Brooklyn Museum. https://commons.wikimedia.org/wiki/File:ITALIAN_IMMIGRANTS_(1905)_ELLIS_ISLAND_NY.png#filelinks

that are no longer only exclusively local, but they are distributed on the planet because risks such as pollution, viruses, terrorism actually do not have borders and cannot be blocked by geopolitical borders, and therefore affect the whole world. However, as said before, some countries, because of their centrality in the power dynamics, might more success-

fully overcome some of these risks thanks to economic, technological, and political benefits that they have. The gap between so-called First and Third countries, but even centers and peripheries within the same geographical area, is so maintained (or even increased), perpetuating and generating new social conflicts. This phenomenon is called *global stratification*, and it is defined as a system of unequal distribution of resources and opportunities between countries. It is now widely thought that globalization involves a complex mixture of the accentuation of differences and increasing standardization. In other words, it is difference-within-sameness – or, perhaps, sameness-within-difference – that best characterizes the socio-cultural condition of the world as a whole (Faccioli & Gibbons, 2009). The future of *global stratification* is varied and depends on the country's position within the world economic system (Andersen & Taylor, 2017). From a political point of view, institutions adopted liberalization policies based on the theory of Comparative Advantage based on Ricardo's theory (1817). This is defined as the choice of regions and countries to specialize in sectors they own specific advantages on, export these goods so that consumers can profit from a wide variety of products at minor costs. However, neoliberalism and the global form of governance have been criticized because, as previously said, they tend to increase globalization disequilibrium, privatizing public services, and dismantling the social state. In addition to that, the big international organizations can cause forms of citizenship erosion since they took very important decisions at a global level, but they are not democratically elected nor give citizens the possibility to question these decisions. Last but not least, purely economic reasons tend to prevail on social and environmental sustainability reasons. Massey proposed Geography Responsibility's concept to identify a different approach to globalization, who optimistically see local places as "*not simply always the victims of the global; nor are they always politically defensible redoubts against the global. For places are also the moments through which the global is constituted, invented, coordinated, produced. They are 'agents' in globalisation*" (Massey, 2004: 11).

In the following section, I will focus instead on the role of the governmental institution to define the European sustainability agenda.

2.2. Policies of and for sustainable innovation

One of the damages that more than others influenced the understanding of the globalized world as previously described, was Chernobyl nuclear disaster, which happened in Ukraine in 1986.

Especially European countries from that moment on, started to reflect to their common future, paying attention to the development of counteracts these collective risks and damages, whit the objective of mitigating their social impacts. In particular, I refer to the World Commission on Environment and Development' *Brundtland* report, also known as Our Common Future report (1987) focusing on sustainable development defined as the "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*".

It addresses two main relevant concepts:

- (basic) needs that have to be prioritized;
- limitations imposed by the state of technology and social organization.

In this report, the Commission proposed a 3E model of sustainable development that addresses both Environment, Economy, and Equity (that it is possible to define as Social Sustainability).

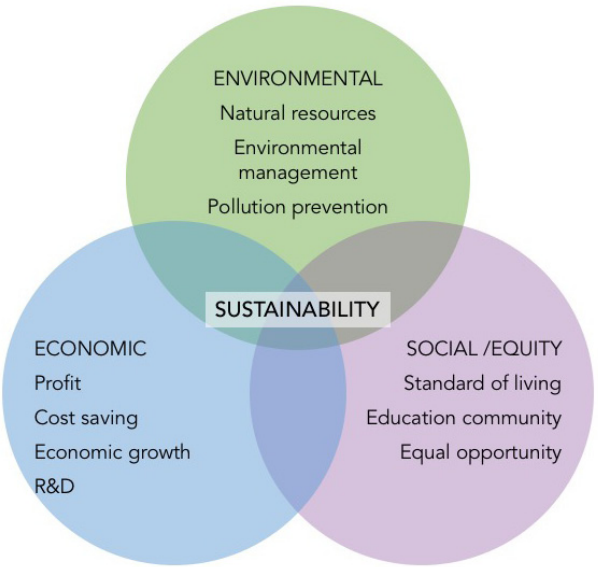

Figure 2 - 3E model of sustainable development. Elaboration by the author

Another important program at the local scale and in particular at the city level was Agenda21 (Rio De Janeiro Summit Declaration, 1992) which gave a crucial role concerning the questions raised on sustainability. Despite their complexity and extraordinary ability to self-organize, cities could

not exist, grow and survive if not using an extremely varied number of natural resources, which are not always renewable. Chapter 28 of Agenda 21 makes special reference to local authorities. Many of the problems, as well as the solutions, raised by the A21 have their roots at the local level. The Commission regards processes that require many years to be designed and implemented, as they are complex and not codified. Despite their flexibility, they provide essential principles: transparency of roles and processes; accessibility of information; participation of different actors also in the construction of policies; subsidiarity, all subjects (stakeholders) must play an active role and taking responsibility. A21 implies a change of perspective: dialogue and bottom-up approaches, aimed at engaging local actors and focusing on problem building processes rather than problem solving. Ten years later, during the World Summit on Sustainable Development, held in 2002 in Johannesburg (South Africa), the WEHAB (water, energy, health, agriculture and biodiversity) Agenda was adopted; the idea on which WEHAB was developed is that cities to be liveable need to be supported by policies and actions able to protect global common goods.

In more recent years, the ONU Agenda 2030 (2015) identified 17 Sustainable Development Goals (SDGs)[2] identified to achieve a better and more sustainable future for all.

1. No Poverty
2. Zero Hunger
3. Good Health and Well-being
4. Quality Education
5. Gender Equality
6. Clean Water and Sanitation
7. Affordable and Clean Energy
8. Decent Work and Economic Growth
9. Industry, Innovation, and Infrastructure
10. Reducing Inequality
11. Sustainable Cities and Communities
12. Responsible Consumption and Production
13. Climate Action
14. Life Below Water
15. Life On Land
16. Peace, Justice, and Strong Institutions
17. Partnerships for the Goals

2. www.un.org/sustainabledevelopment/sustainable-development-goals/.

Figure 3 - Map Sustainable Development Goals 2019
By Grimpeurgf – Own work, CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=81713141

These are only a few examples that, over time, addressed at a political level the issue of Sustainable Development, defined as the concertation efforts towards building an inclusive, sustainable and resilient future for people and the planet. In order to achieve it, three core elements should be harmonized: economic growth, social inclusion, and environmental protection, which are all crucial for the well-being of individuals and societies. These strategies are thought at a sovra-national level, but in order to be achieved, actions should be carried out at a local level. This equilibrium between local and global is particularly relevant and allows the engagement of diverse communities and stakeholders. In many places, there has been a reaction from below, partly influenced by and based on new technologies; these facts demonstrate that the so-called Network Society theorized by Manuel Castells (1996), did not cause, as warned both by techno-skeptics and also by some techno-enthusiasts and techno-repentants[3], the death of proximity, of face-to-face relations, and

3. www.washingtonpost.com/classic-apps/techno-skeptics-objection-growing-louder/2015/12/26/e83cf658-617a-11e5-8e9e-dce8a2a2a679_story.html.

of cities. In many cases, technological innovation favored the circulation of information and knowledge about crucial social issues allowing new modes of proximity, confrontation, and organization (Negroponte, 1995; Martin, 1996; Cairncross, 1997; Morgan, 2004; Barrat, 2013; Lanier, 2014; Keen, 2015). In the interstices of both the city and the network, traces of communities have been created (to quote a text by Arnaldo Bagnasco, 1999) that share the same values, the same knowledge, and pursue common goals. Anna Meroni (2007) talks about creative communities and Ezio Manzini of hybrid communities of place (2018); the firsts are composed of individuals using existing (local) resources to favor system innovation in creative ways. Individual interests often converge with those of society and environmental sustainability; the seconds are groups of people in contact with each other both in the physical and virtual world, which also share the attention for a place and carry out actions to improve it. Both these communities generate solutions to their everyday life problems and new ideas about society, production, and well-being (Manzini, 2013: 75). These communities' definitions are still very local as the impacts that these actions might have. However, small actions can bring to a multiplication of initiatives and the diffusion of a culture oriented towards sustainability and social innovation goals. The network improves the possibilities of becoming aware and informed of social issues and having an "echo chamber" to create a critical mass on specific issues. This delicate equilibrium that goes from micro to macro and back is well defined by the concept of *Cosmopolitan Localism* (Manzini reference to Sachs, 1992); this is an approach or even a stance composed of different degrees of density and connectivity. "*The emerging cosmopolitan localism can therefore be seen as a creative balance between being rooted in a given place and community and being open to global flows of ideas, information, people, things and money (Appadurai 1990 and 2001) […] Nevertheless, when this balance is successfully achieved, it creates a new idea of place that, in my view, is truly contemporary: a place which is no longer an isolated entity, but which becomes a node in a variety of networks. Short networks generate and regenerate the local social and economic fabric at the same time as long ones connect that particular place and its resident community with the rest of the world*" (Manzini, 2013: 76).

In the following section, I will introduce and define the concept of social innovation, proposing to look at its impact and introduce the concept of *well-being scalability.*

Figure 4 - Occupy Wall Street March 16, 2012, CC BY-SA 2.0 by Michael Fleshman

Figure 5 - Friday for Future Munich 4.3.2019 by CC BY-SA 2.0 by Martin von Creytz

Figure 6 - ¡Ni Una Menos! // Buenos Aires 2016 CC BY 2.0 by Colores Mari

Through the excursus made in the previous paragraph, it is possible to understand how social changes erased sustainability questions at different levels; in this sense, social innovation always has to be sustainable.

Social changes produce social facts that create social needs. In order to clarify this aspect, I am going to provide some examples.

The aging population is not an issue in itself; however, in our contemporary (and future) societies this fact produces needs connected with large numbers of people who – for example – will have to access to the pension system, or also needs connected with the design of services and private and public spaces, etc.

Another example is connected with the increasing cultural diversity of our cities, which is not something "bad" *per se* but which evidently requires new ways of addressing issues related to education, housing, and work systems access and to the erase of conflicts between new and old citizens.

The last very important example which I want to bring here is healthcare and well-being; this case is different from the previous ones, because healthcare issues, such as the emergence of new viruses or the chronicization of some types of diseases (such as diabetes), are already both facts and problems. Apart from a health emergency, such as the one we are experiencing these days due to COVID-19, and which will affect the whole society at different levels, also basic healthcare services are not equally provided everywhere and for everyone; think for example to those countries where citizens do not have access to the public health system, for example, and this fact clearly increases social inequalities.

All these examples lead us to – finally – define social innovation. Several scholars and research centers developed their own definition of the concept, which differ, especially regarding the stakeholders involved and typologies of impacts.

First of all, it is important to premise that, as Pol and Ville stated (2009), in order to understand what social innovation is, we need to differentiate between economic and non-economic (positive and negative) consequences of innovation; quoting Kuznets (1974), who mainly referred to technological innovation, economic consequences are connected with productivity and consumption increases; while non-economic consequences bring to institutional changes, dislocating effects, and depletion of the natural environment; both do not necessarily have "good" and sustainable impacts on people and places. Instead, economic and non-economic impacts deriving by social innovation (should) bring only positive effects on people and places.

As said in the introduction, social innovation can both be interpreted as a process and as a product. This is evident in the definition provided through time by the different disciplines and fields that analyzed and used this concept.

I want to report here one of the first use of the concept, which was very much connected with bottom-up actions carried out in contrast with the legitimate power. In 1982, Chambon, David, and Devevey published a booklet "Les innovations sociales" on their ethnographic research based on the workers' and students' revolts of the 1960s and 1970s. Their research was based on social movements and collective actions and how these can favor social innovation identified as a process of social change deriving from crisis moments. To them, social innovation is directed to answer towards social needs that are not satisfied (Baker & Mehmood, 2015).

In April 2000, OECD carried out the Forum on Social Innovation, adopting this definition of it: "[social innovation] *can concern conceptual, process or product change, organizational change and changes in financing, and can deal with new relationships with stakeholders and territories […] It seeks new answers to social problems by: identifying and delivering new services that improve the quality of life of individuals and communities; identifying and implementing new labour market integration processes, new competencies, new jobs, and new forms of participation, as diverse elements that each contribute to improving the position of individuals in the workforce*"[4]. This definition is very wide, but it stresses as first an important area of social innovation: quality of life of individuals and communities, looking specifically at the working sectors.

Other definitions were more limited to other specific sectors and stakeholders such as the one provided by Geoff Mulgan (2006: 146) and adopted by Young Foundation: "*Social innovation refers to innovative activities and services that are motivated by the goal of meeting a social need and that are predominantly diffused through organizations whose primary purposes are social*". However, this definition in my opinion does not take count of a trend that would have followed, that is the ideation, development and participation in social innovation actions by different typologies of stakeholders who collaborate and also not necessarily could be included in the definition of "*organisations whose primary purposes are social*". We might prefer instead the broader definition given by the Center for Social Innovation at the Stanford Graduate School of Business: social innovation is "*a novel solution to a social problem that is more effective, efficient, sustainable, or just than existing solutions and for which the value created accrues primarily to society as a whole rather than private individuals*" (2008)[5]. In both views, the collaboration

4. www.oecd.org/fr/cfe/leed/forum-social-innovations.htm.
5. https://ssir.org/articles/entry/rediscovering_social_innovation.

between public, private, and nonprofit sectors is required. However, for obvious reasons, the Center for Social Innovation, more than Mulgan, focuses on businesses that create social and – in general – socially responsible businesses. The increasing possibilities for individuals or groups of individuals with "*creative social ideas*" (Mattei & Mulgan, 2014: 47) to establish commercial and non-commercial ties with large institutions are certainly an indication of a greater chance of transforming these ideas in effective solutions and potentially successful businesses.

The definition provided by Scott (2007: viii-xxi) stresses the "transversality" of social innovation, stating that "*we call this definition of social innovation 'oblique' because it is unclear whether social innovation includes all types of new ideas or it is circumscribed to 'new kinds' of social structures*". In the same book, Heiscala, identifying five ideal types of innovations (technological, economic, regulative, normative and cultural), states that social innovation is acquired when change is performed in at least one of the following three social structures: cultural, normative and regulative (Pol & Ville, 2009).

To conclude, I introduce here a new concept, which I call *well-being scalability* and which I will discuss in the conclusions of this book. In the view of *well-being scalability*, of social innovation processes and products, even if pointing at the quality of life improvement of specific communities, populations or actors, do not damage others individuals or social groups; instead, also people who are not immediately targeted for these solutions might be indirectly impacted by the improvement of others' lives. Indeed, "*Focusing policy on subjective well-being has a number of advantages. Research shows that higher well-being contributes to many other important outcomes such as better health and higher productivity at work. Furthermore, dialogue with the public suggest that people can relate to the idea of well-being*" (European Social Survey, 2015: 5).

The approach here proposed is very different from the creative destruction whose Marx and Schumpeter talked about, since as we said before, the destructive side of creativity was particularly referred to the limits of capitalism; however, social innovation might and should confront exactly the negative externalities, the contradictions and the unsustainable effects of capitalism and of liberal approaches to the market. This concept of *well-being scalability*, which for sure will need some additional proves and understanding, can be addressed by referring to different scalability actions (Moore, Riddell & Vocisano, 2015):

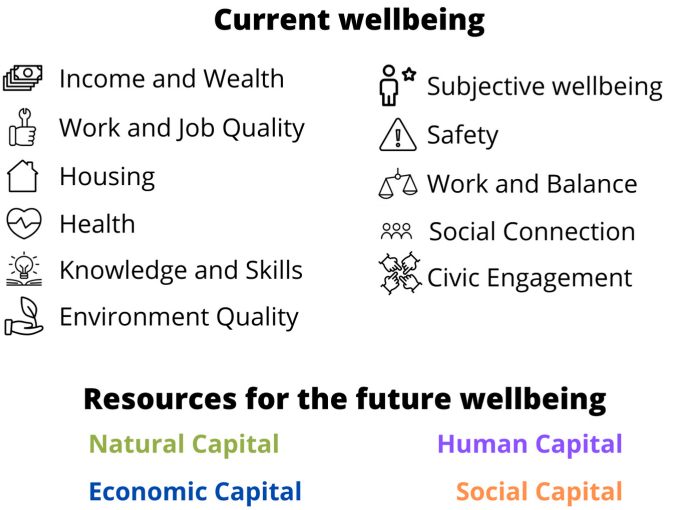

Figure 7 - Wellbeing representation based on "How's Life? in OECD countries" report. Elaboration by the author[6]

- scaling out: refers to de impact on greater numbers (of people and or places). This can be achieved through the replication and dissemination of social innovation' solutions and processes;
- scaling up: refers to the impact of social innovation on law, policy, and institutions, through the development, for example, of new policies;
- scaling deep: refers to the impact on cultural roots; this is the most difficult to achieve since it requires a mental shift of communities and societies at large.

As stressed by Baker & Mehmood (2015), social innovation impacts at different society levels: at the micro-level, satisfying human needs; at the meso impacting on the relationship between individuals and social groups; at the macro-level, generating the empowerment of marginalized individuals and social groups also through institutional leverage. Following Moore, Riddell & Vocisano (2015) in connection with what proposed by

6. *Icons from* https://thenounproject.com/.
Money by No More Heroes; Work by Kiran Shastry; House by Gimzy 7; Health by Sarah; Knowledge by Nithinan Tatah; Environment by Shmidt Sergey; Human by Andrejs Kirma; Danger by fajar hasyim; Balance by jai; Friends by The Icon Z; Participation by Nhor.

Nilsson (2003) and Baker & Mehmood (2015), social innovation has to be evaluated according to three main characteristics:

- scale, the number of people affected; which is correspondent to the scaling out dimension;
- scope, multidimensional and deep societal improvement; which is correspondent to the scaling up dimension;
- resonance, change in people's imagination; which is correspondent to the scaling deep dimension.

2.3. The urban scale of (social) innovation: the concept of resilience

In this section, I will address the relevance of the urban context starting from theories that analyzed proximity as a valuable resource for the development of creativity and innovation. I will then present the concept of resilience as the capability that cities, especially those who own creative and innovative resources, can put in place in moments of crisis; the concept of resilience will be finally linked with the social innovation one.

Richard Florida identifies cities as enablers of innovation and creativity, specifically looking at entrepreneurship. He identified the Creative Class as a new socio-economic class, creating ideas rather than physical products, as the driving force of post-industrial societies and characterizing global, economies (Florida, 2002; Florida, Adler & Mellander, 2017).

The urban scale is particularly relevant in the present discourse for two main reasons. Because from the one side inside cities, issues related to sustainability, inequalities, conflicts emerge; from the other side, because cities are the places where these issues can be more easily and successfully addressed. In fact, because of the concentration of the majority of economic and residential activities, cities are the main energy consumers and those that produce the greatest impact on the environment but also places where enduring inequalities are created. At the same time, cities and local governments are the scale at which environmental and social problems can, and should, be more effectively managed and addressed because they constitute the main seat of decision making powers, have considerable economic resources, organizational skills and knowledge institutions are connected to the network of the global economy.

Focusing on the last aspect, which concerned the implementation of solutions, we have already referred to the importance of making a step towards the relevance of local contexts and – therefore – local cultures.

I am going to talk about the importance of localization and proximity inside the innovation and creation processes. This element is common both to industrial and cultural districts, for example. The creative and innovative process could be influenced by: breadth of the places (from a territorial and demographical point of view), important economic and social transformations, position and geographical relevance of places, wealth, talent, immigration, and reactions to conservative power. In the same way, places where innovation happens, are characterized by social and cultural structures which influence (positively or negatively) their advancement.

The first to take into consideration the relationship between the economy and places was Alfred Marshall. He talked about the Industrial Atmosphere (Marshall, 1890), which is characterized by four main elements: the presence of external economies; the promotion of the development of the knowledge; the promotion of the innovation; a mix between collaboration and competition. Also, in the Neoclassical approach, Weber (1909) referred to the localization theory according to which every industry has a perfect localization; this approach was too static because it did not take into consideration the power of the dynamics that caused the expansion or the contraction of industries in different times and spaces. Similarly, in 1955 François Perroux (1955) proposed the theory of the Growth Pole; according to him a Growth Pole is a collection of enterprises that generate a cultural and economic development in a determined territory.

In the late '70s, the concept of Industrial Atmosphere was reactivated by the Italian scholar Giacomo Becattini, who showed that small and medium-sized enterprises specialized in the same industrial sector were forming a district, that is a system in which not only competition but also cooperation took place (1979). As wider portions of territories are concerned, the business economist Michael Porter (1990) theorized the competitive advantages of Nations, talking about the cluster concept.

To conclude this brief summary, I refer to Innovative Milieu's concept proposed by Roberto Camagni (1991). The Innovative Milieu definition is very similar to that of field proposed by Bourdieu, which I previously discussed. In accordance with these definitions, Peter Hall (1998) identifies the reasons why some cities in historically determined periods had been characterized by a lively cultural and creative ferment, and he also makes an analysis of the characteristics that allow cities to become innovative. As Marx did to explain the role of creativity in modern societies, Hall uses the notion of capitalism in order to identify three main historical moments during which a strong innovative role functioned in several countries. The first moment occurred during the pre-capitalistic period in England, in Manchester and Glasgow, where there was the

first industrial revolution. During this phase, innovation was under the control of organized science and worked thanks to the synergy between brilliant intuitions and organizational capacities. The second phase of capitalism (1880) is located in Germany, in Berlin, and in the United States, in Detroit. During this period, innovation corresponded to scientific progress. Finally, the third phase is placed first in the United States (1950), in San Francisco and then in Japan, in Tokyo, and mainly had military purposes. According to Hall, these places were characterized by equalitarian social structures, economies that grow very quickly, informal structures of exchange of technological knowledge and ideas, and a high synergy level. As we can notice, these elements also recur in the definition of the concept of Creative Field. In the definition of Scott (2006), the creative field has three main peculiarities:

1. there is a network of firms and workers which create an interactive agglomeration;
2. "*it is constituted by infrastructural facilities and social overhead capital, as schools, universities, research establishments, design centers, and so on*" (Scott, 2006: 8);
3. it expresses the "*cultures, conventions, and institutions*" (ibidem), which are characteristic of the agglomerated production system and work.

Knowledge (codified or not) and information circulate inside metropolitan areas and creates synergies; the presence and availability of cyberinfrastructures are key factors that determine the cities' position of relevance. Knowledge sharing is an example of soft factors, together with the availability of an attractive residential environment, tolerance, and alternative lifestyles, a lively cultural scene, etc. (Musterd *et al.*, 2007). Cyberinfrastructures, instead, represent a typology of hard factors; other hard factors contributing to the creation of an Innovative Milieux are, for example, the availability of a labor force and office spaces, accessibility, local and regional tax regimes, etc. (ibidem). All these factors where specifically identified as determinants for the attraction of Cultural and Creative Industries and creative workforce (talents, creative class, etc.) seen as motors for the local development and for places to overcome periods of crisis. Indeed, "*Part of building resilience in complex systems is strengthening cultures of innovation*" (Westley, 2013: 6) and Cultural and Creative Industries seem to have the highest levels of resilience to the crisis (Stumpo & Manchin, 2014); there are not sufficient data to demonstrate the veracity of this statement, though. However, if we refer to the

definition of resilience, in the literature on economics, it has mainly to do with the ability of industries to adapt their strategies to answer to the economic changes as soon as they appear (Christopherson, Michie & Tyler, 2010) we can agree on the fact that to greater adaptability of processes, products and workers (as generally are the CCIs ones) correspond greater possibilities of resilience.

In the table below, it is possible to see different definitions of resilience. It is important to notice how some concepts deriving from hard science (such as physics) are adopted and adapted to other contexts and objects of study.

Discipline	Source	Definition
Ecology	Holling (1973)	The ability of the system's components to persist and their ability to adapt within multiple stable states
Economics	Simmie and Martin (2010)	The ability of an economy to recover from or adjust to the effects of adverse shocks to which it may be inherently exposed
Engineering	Bergen et al. (2001)	The ability of a system to return to a steady state or point of equilibrium after a disturbance
Physics	Prosser and Peters (2010)	Systems or objects that are invulnerable to the impact of external forces
Psychology	Bonanno (2004)	An individual's tendency to cope with stress and adversity, by 'bouncing back' to a previous state of normal Functioning
Sociology	Adger (2000)	The ability of communities or groups to adapt to external disturbances, towards more desirable trajectories
Socioecology	Berkes, Colding, and Folke (2003)	The ability of a system to self-organize, learn and adapt in the face of change

Figure 8 - The interpretation of Resilience in different disciplines; table base on Bec, McLennan & Moyle, 2015

The concept of resilience is very close to that of social innovation. As Moore *et al.* (2012) stated, "*Social innovation is an important component of being resilient – new ideas keep a society adaptable, flexible, and able to learn*" (ivi: 91).

Indeed, both social and political factors have a dramatic influence, as I will discuss, on a geographical area's resilient capacities. Regional resilience also depends on enterprises' capacity for innovation; the entrepreneurial environment's ability to create new opportunities; and the attitude of institutions and individuals to be reactive (Sabatino, 2015). Resilience, on a smaller scale and from a social point of view, has to do with the maintenance and improvement of individuals' quality of life, which can be achieved thanks to the creation of desirable contextual conditions.

To support this connection between resilience and social innovation, I refer to the work carried out by Westley (Westley & McGowan, 2017; Westley, 2013; Westley, 2008) at the Waterloo Institute for Social Innovation and Resilience. She stated that "*The capacity of any society to create a steady flow of social innovations, particularly those which re-engage vulnerable populations, is an important contributor to the overall social and ecological resilience*" (ivi: 1). In this view, the capability to innovate is a way for societies to be resilient and resists at crises, shocks, and disasters.

Policies aimed at attracting creative and innovative knowledge skills, based on the collaboration between Academia, Government, and Enterprises (Etzkowitz & Leydesdorff, 1997; Etzkowitz & Leydesdorff, 2000), are very relevant for resilience objectives (Sotarauta, 2005). The collaboration between different stakeholders is at the base of social innovation, and a model that also comprised the civil society is needed to achieve it. Indeed, as Mulgan states, cities are like a beehive (Mulgan *et al*., 2007). The bees in the hive represent citizens who have ideas or potentialities as yet unexpressed. In order to allow them to put these potentialities into practice, bees need trees, which in the metaphor represent public and private institutions that own power and money.

Resilience theories are useful to look at issues systemically, starting – for example – from the stakeholder involved, as it is going to be discussed in the following section.

2.4. Innovation' stakeholders: the social role of universities

In this section, I will present "Helix" models as capable of addressing the complexity of innovation from a systemic point of view. Academy and, in particular, Universities will be the main subject that I am going to take into consideration for the present discourse.

The Triple Helix model (Etzkowitz & Leydesdorff, 1997; Etzkowitz & Leydesdorff, 2000) focuses on the relations between universities, industry, and governments according to their history, approach, stance, which can favor or impede the creation and the success of a national innovation system based on knowledge. Reconnecting this approach to the introduction to innovation proposed in the first pages of this book, as Etzkowitz & Leydesdorff (ivi: 113) "*when knowledge is increasingly utilized as a resource for the production and distribution system, reconstruction may come to prevail as a mode of 'creative destruction'*".

An additional dimension, that is Civil Society, has been added in the Quadruple Helix model. Civil society is a wide dimension which

can include the public, as users and consumers (as in the prior definition proposed by Carayannis and Campbell (2009; 2012)), citizens, associations taking part (co-operating) in knowledge innovation processes (Arnkil *et al.*, 2010; MacGregor, Marques-Gou & Simon-Villar, 2010; Afonso, Monteiro & Thompson, 2012). Civil society is the terrain where needs and crisis impact and where social transformation actions emerge (Swyngedouw, 2005; Baker & Mehmood, 2015).

The Quintuple Helix (Carayannis & Campbell, 2010) frames knowledge and innovation in the context of the environment. It can be interpreted as an approach in line with sustainable development and social ecology. As civil society does, also the environmental context, composed of specific (natural) resources, influence the potentialities of social innovation.

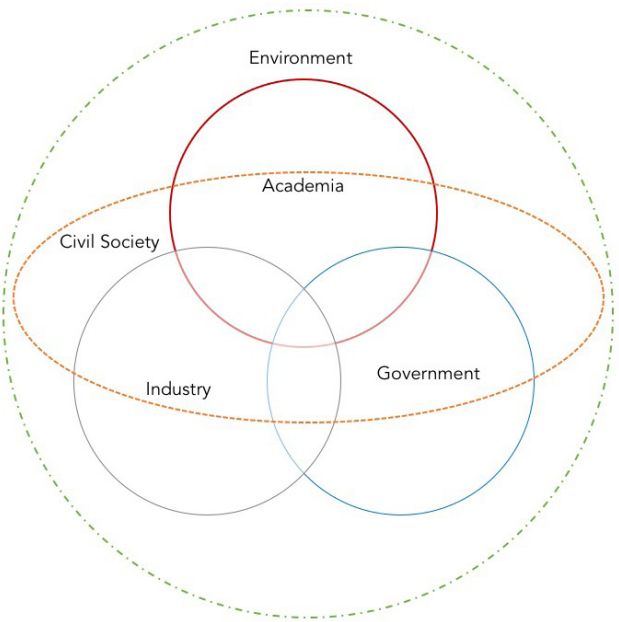

Figure 9 - Quintuple Helix model base on Carayannis, Elias G., Barth, Thorsten D., Campbell, David F.J. (2012-08-08). Elaboration by the author

In general, all three models are grounded on the idea that innovation is the outcome of an interactive process involving different spheres of actors, each contributing according to its 'institutional' function in society (Cavallini *et al.*, 2016). In addition to that, they are all referring to economic innovation, which can lead to territorial (regional and national) development.

Starting from the Triple Helix model, the collaboration in R&D among public institutions, enterprises and universities is able to attract specialized workers in the desired fields on the territory (Etzkowitz *et al*., 2000), influencing the development of an Innovative Milieux. Learning processes connected with the institutional and spatial contexts influence the presence of innovation processes in a place. The relationship between "helix" models and social innovation is therefore biunivocal. Indeed, from one side, one of the goal of social innovation is exactly that to "*erase traditional boundaries between public, private and civil society actors*" (Phills *et al*., 2008: 36); from the other side, social innovation is possible thanks to the renovation of roles and relationships between these different stakeholders.

In these "helix" models, universities no longer have the role of "ivory towers", which lavish knowledge, but they also recover a strong entrepreneurial role. Academic entrepreneurship represents an extension of research and teaching activities and, from the other side, a form of internalization of capacities of technological transfer that conduct the university to have a role that is usually characteristic of industry (Etzkowitz, 2006). In particular, "*universities act both as a primary source of 'knowledge workers', as well as the key factor of production – knowledge itself*" (Wolfe, 2005: 169), and this knowledge is useful to those firms which try to succeed in the most advanced and innovative sectors of the market (Cohen & Levinthal, 1989; Cohen & Levinthal, 1990). Moreover, universities help to create city cultural life; they serve the local civic community and are active players in urban planning and development. The so-called 'third mission' to be accomplished asks universities to become increasingly engaged with their external surroundings and respective constituencies (Stachowiak *et al*., 2013).

This focus on higher education allows indicating two fundamental characteristics that innovation has to satisfy:

- being an interactive process; this proposition opposes the adoption of a linear kind of process in which innovation is looked at as the simple following of research and marketing phases (Morgan, 1997). The interaction as to be favored at different levels, such as between enterprises and scientific infrastructures; different functions inside the same company; different scientific fields; who produces and who consumes; enterprises and the institutional milieu;
- being rooted in institutional routines and social conventions; since tacit knowledge covers a relevant role in innovation strategies, organizing and making explicit knowledge is necessary. This avoids the risks of organizational oblivion and favors the replicability of the innovative processes.

The University, working in synergy with Industry and Government, is able to pursue these two aims and thus permits the creation of innovation strategies.

However, the Triple Helix model is mainly focused on economic innovation, which can positively affect local development.

The addition of Civil society and Environment to the model was actually due to the increasing innovation scopes of spheres of interest, which included sustainable (and) social innovation, as we discussed before, even if these models remained (at least in their definition) mainly focused on economic development.

Figure 10 - The School of Design Campus, Politecnico di Milano. CC BY-NC-SA 2.0 Carla Sedini

Keeping the attention on universities, in line with NESTA (2007), it is possible to identify four ways in which they can impact the regions, and they can promote social innovation:

1. "Driving forward the research frontiers", which means that universities have to be focused on R&D. For this reason, they need the appropriate funding from public and private institutions.
2. "Giving people the skills for innovation". Apart from increasing the number of graduates, the focus has also to be on the skills they get from universities. Indeed, not all the skills are useful for innovation purposes; beyond science and technology, a new focus is now on entrepreneurism; particular attention should be paid to:
   a) sustainable entrepreneurship, devoted to preserving nature, life support, and community to develop new products, services and, processes, and services and bring economic and non-economic gains (Shepherd & Patzelt, 2011). Actionable competences on sustainability can be developed with a learning experience as those that can be developed on the job and through experiential platforms (Cottafava, Cavaglià & Corazza, 2019);
   b) social entrepreneurship, defined as the process of creating and growing a venture, either for-profit or non-profit, where the motivation of the entrepreneur is to address social challenges. The connection and the mixture between diverse typologies of skills (cognitive and technical) is nowadays very recommended (as for example is increasingly happening in Design Schools and Universities);
3. "Providing regional leadership", indeed, universities are more and more part of the political agendas of local government because of their instrumental economic and social roles.
4. "Exchanging knowledge", which is about the commercialization of research, but also knowledge transfer and exchange. Universities acting also as hubs in an international network of knowledge can influence the so-called agenda setting both at a local and a global level, as it is better explained in the following point.

Even if Universities are more and more asked to play an economic role, I think it is important that R&D activities maintain their independence and investigate and develop research on crucial subjects that are not going to have (immediate) revenues economic effects. The risks of privatization of research and development processes might have very negative effects from a social point of view. To avoid this trend, over the last decade, policies

and programs to improve the collaboration and the permeability between science, innovation, and society have been developed, especially across Europe (Boden, Johnston & Scapolo, 2012; Saurugger, 2010). For example, Lund Declaration (2009), as well as European Commission (2010, 2013) stressed the importance of addressing societal needs, ethical and sustainability questions in research and development, paying particular attention to the role of citizens activating within research the study, the development, and the implementation processes and activities of public engagement. Design Universities are probably one of the most involved and impacted by the previously described trends and risks, as it will be addressed in the following chapter.

3. Designers and consumers as actors of change

Since 2009, the European Commission has been promoting and highlighting the importance of design innovation and design approaches as levers for growth in different fields, from business to public sectors. As evidence of this, the document "Design as a driver of user-centered innovation" was released (EU, 2009).

The report "Design for Growth and Prosperity" (Thomson & Koskinen, 2012), which was resulting from the European Design Leadership Board (EDLB) activities and consultations, contains a series of strategies and recommendations to support the development of design innovation capabilities in European education, innovation, research, public sector, and enterprise systems (Maffei *et al.*, 2015):

1. Differentiating European design on the global stage. One of the recommendations explicitly refers to sustainable innovation, "*Create a 'Designed in the European Union' label in connection with the European ECOLABEL to stimulate the export of design services. The intention is to make the protection and enforcement of European design and innovation more effective and accessible, whilst at the same time raising the bar on expectations and associating excellence with sustainability*" (Thomson & Koskinen, 2012: 8).
2. Positioning design within the European innovation system. Recommendations related to sustainability and social innovation are "*Continue to support and expand the work needed to develop more effective and reliable methods for measuring the impact of investment in design on growth and social well-being, at the micro and macro levels, and include these within European innovation statistics*"; "*Create guidelines, codes of practice, legal frameworks and experimental spaces to promote the use of Open Design*"; "*Develop a*

European policy that ensures a more sophisticated approach to the public procurement of innovative solutions through the recognition, inclusion and implementation of design as a driver of user-centred innovation" (ivi: 9).

3. Design for innovative and competitive enterprises.
4. Design for an innovative public sector.
5. Positioning design research for the 21st century, embedding "*design research in Europe's research system in order to create new knowledge that will enhance innovation whilst in parallel evaluating, on an on-going basis, the value of design in the Horizon 2020 programme […] through including design researchers in cross-sectoral, multidisciplinary research programmes addressing global challenges such as climate change, food security and health and well-being*" (ivi: 10).
6. Design competencies for the 21st century.

It is evident how design was a discipline that does not only attaint to the production of material goods but also to an area of study and research, a (thinking) approach which seems to be valuable in transversal fields from economy to society at large, as I am going to discuss in the following pages.

3.1. Designers for good

Design, production, and consumption move from a level that has mainly to do with goods to a level that has to do with symbols, values, and identity construction.

Before specifically address social innovation, I will present the issue of sustainability in design processes looking at designers as potential catalysts of change.

The importance of artifacts cannot be denied since they are also used to create representations of the world. Products (both tangible and intangible) do not emerge from purely mental structures; instead, they are (or should be) outputs of long processes of negotiation between the material world, historical associations, and people (Latour, 1999; Martin, 2005). As Maldonado stated (1991), the design project is part of a complex process of defining the structure, form, use, material, and production characteristics, the symbolic cultural and social sense that the designer must negotiate with other actors in the process of continuous historical evolution. Designing an object (but also a service) means coordinating, integrating,

and articulating factors relating to the individual and collective use of the product as well as those relating to its production. This means that functional, symbolic, and cultural factors will be combined and integrated with technical-economic, technical-construction, technical-systemic, technical-productive, etc. factors (Maldonado, 1991).

In general, design involves creating something new or transforming a less desirable situation into a preferred one (Simon, 1998). Each innovation contributes to the systemic organization of objects and social practices within which the product is embedded; also, the appearance and the function of (innovative) products reflect and sustain the larger ensembles (Molotch, 2003). For this reason, designers must own or have to acquire knowledge on social and economic contexts, their users and customers, and the impacts of their work on societies. Understanding how things work and how things will be created, produced, sold, and why it requires explanation, and sometimes requires prediction (Friedman, 2002). Otherwise, designers would create new kinds of vulnerabilities instead of solving or at least facing those already existing.

In the brilliant book "Where stuff comes from", Harvey Molotch (2003) defines designers to (potentially) be actors for change, thanks to the political role that they can play in the production system. As said before, the systemic view is crucial for innovation and change; to this end, Molotch talks about *lash-up* as an ethical approach towards design and innovation, which is based on the knowledge and comprehension of all the factors that play significant roles in the innovation process.

Therefore, innovating should mean dealing not with one element at the time but with all the material, emotional, and political, etc. elements with which it has come to be bound.

"*The problem is not the will to produce and make life through artifacts, but doing it with such radical inequalities and severe ecological consequences*" (ivi: 218).

Designers should systematize all the factors that contribute to the innovation, production, and diffusion of objects: economic, technical, cultural, geographical, and institutional factors, trying to play a mediator role between different stakeholders and spheres of interest in order to produce a real change.

Product design was the main focus of the *Lash-up* model; however, other design sectors can easily and profitably use it. This is particularly evident when we refer to public spaces' design, for example, or to services that answer local needs. Already in the '70s, Victor Papanek stressed the need for designers to develop a major responsibility towards society and environment (Morelli, 2007) and, according to Papanek, they are supposed

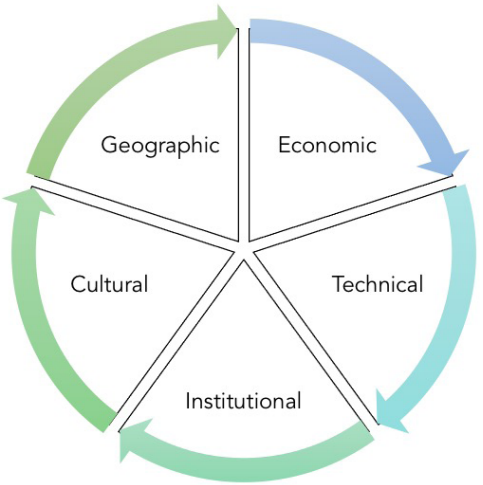

Figure 1 - Molotch lash-up model. Elaboration by the author

to do it outside the mainstream market. Whitely, in his book "Design for Society" (1993), followed the same path, harshly questioning consumeristic principles that guide society and designers' work.

Both scholars distinguish between the design for the market and the design for society; the first is mainly oriented at creating products for sale, while the second satisfies human needs. This separation between market and society was largely criticized since products designed for the market can also meet a social need even if there are populations (customers) who do not participate in market dynamics because of their income and social status, for example (Margolin & Margolin, 2002).

Before addressing the increasing centrality of users and participation in design processes and through design, I will briefly present design research approaches that constitute the theoretical framework for the present discussion and are very relevant to introduce the following chapter of this book.

3.2. Practice-based Design Research and Research through Design

Design in the approach used in this book is both object and subject, content and container of Innovation. Going beyond products and even services, design can be understood and exploited as a "way of thinking", as

a research-action process to intervene in complex conditions, as mentioned in the first chapter. Cross (2001; 2007) has explained in detail the "designerly way of knowing", illustrating the designers' unique way of knowledge contribution through reflections on practices. Compared with scientific and engineering, designers use abductive thinking logic to explore potential answers and solutions. A typical design process as identified by Kumar (2004) iteratively goes through research, analysis, synthesis and realization phases (Pei, Sedini & Zurlo, 2019).

Theories, concepts, and topics from Science and Technology Studies (STS) have great potential to support the creation of improved experimental design practices. At the same time, STS scholars have begun incorporating design practices into their work, creating new spaces for experimentation (Forlano and Sedini, forthcoming). In the first case, we can refer to Practice-based Design Research; in the second case, we can talk about Research through Design. I want to address these concepts here because of the previously mentioned contradiction that emerges when the market is seen in opposition to society. In this sense, as previously discussed, research carried out within universities can be of great help in experimenting outside and in contrast with most capitalistic market logics.

In general, Design Research mainly refers to the creation of new design knowledge, such as improved conceptual and operational tools to benefit the design discipline. Design Research is necessarily interdisciplinary, since it is based on human scientists (or other researchers) production of knowledge, using methods and tools proper to other disciplines. Design Research is also composed of a problem-reframing phase through ideating, iterating, and critiquing processes, in order to identify a real problem and develop a series of artifacts (Zimmerman, Forlizzi & Evenson 2007). Looking at the definition of Practice-based Design Research, as Koskinen *et al.* states (2011: 5) design researchers:

- make prototypes, products, and models to codify their own understanding of a particular situation and to provide a concrete framing of the problem and a description of a proposed, preferred state;
- focus on the creation of artifacts, which both reveal and become embodiments of possible futures
- can explore new materials and actively participate in intentionally constructing the future.

Research through Design, instead, aims to produce visions and proposals through the use of methods, tools, and skills proper to design

(Manzini, 2015). Koskinen *et al*. (2011) identified three typologies of Research through Design:

- *lab*, where hypotheses are studied, through prototypes in controlled settings;
- *field*, which happens in the 'real' world, and involves other relevant stakeholders beyond researchers/designers;
- *showroom*, where new prototypes are produced to demonstrate a particular phenomenon or new technology (Froukje, 2018).

Looking at the research design practice to be preferred when social innovation is taken into account, I propose here the Systemic Design approach, based upon Systems and complexity theories (von Bertalanffy, 1968) and design thinking. Systemic Design is a human-centred systems-oriented design practice (Jones, 2014; Toso, Barbero & Tamborrini, 2012; Ryan, 2014), and it is particularly useful to face sustainability at environmental, social and economic levels. A system is a whole entity that cannot be divided into independent parts, and the behavior of each element always has an effect on the whole system and on the interdependent elements (Ackoff, 1997). The system thinking approach looks at the bigger picture and tries to connect dots, facilitating and formulating new relationships. Designers share a similar approach and mindset; moreover, it provides adequate methods and tools. Societal problems are complex and caused by multiple and interconnected reasons over time, and they cannot be fully solved with a solution. It is even difficult to articulate these societal problems, which are often ill-structured (Dorst, 2015), wicked and interdependent on each other. Here is where systemic design, combing system thinking, and designerly ways of knowing, fits perfectly in this context as a lens to look into societal issues. It starts with understanding the real situations through searching for and collecting data and information from the contexts and diverse actors. Designers can notice the weak but essential data and information and identify the hidden patterns and relations to make sense of that (Pei, Sedini & Zurlo, 2019). This approach also influences the typologies of outputs of the design research process; indeed, outputs go beyond the development of products, including the design of services and systems in which they are inserted. It has been talking of Product Service System (PSS) which can be defined as complex combination of products and services supporting production and consumption (Morelli, 2002; Manzini, 1993). "*PSS are socially constructed systems, whose characteristics are determined by the different cultural, social, economic and technological frames of the actors involved in their construction*" (Morelli, 2002: 5) and it can be future-oriented.

Looking at disciplines which specifically thought "outside the market", Speculative and Critical Design are aimed at favoring the debate on social, environmental, cultural and ethical issues among all the relevant stakeholders; their contribution takes place at the preliminary stage of the Design Research during which experimentation is carried out in order to discover, imagine, and understand the possible, desirable relationship between unknown (research) objects and the end-users (Ferrara, 2015). Speculative and Critical Design are used to stimulate reactions among people (stakeholders) through thought-provoking materializations of counterfactual concepts (Dunne & Raby, 2001; 2013). Ehn (2006) proposes the idea of 'transcendence', that has to do with the "*exploration of possibilities outside of the current paradigms of style, use, technology or economics*" (Fuad-Luke, 2013: 84). This led to talk about Critical Making, a way to engage users and other stakeholders through material production in order to bridge the gap between creative physical and conceptual exploration (Ratto, 2011). Design Exploration is mainly based on the question "What if?" (Schön, 1983). *"As a sign of recognition, design exploration research almost always excels in what Schön calls 'problem-setting'"* (Fallman, 2008: 7), in particular, exploring possibilities outside current paradigms.

Often Design Exploration uses artifacts to open up a discussion on a phenomenon. Schön talks about generative metaphors as a "space" for "frame-reflection" and "frame-experiment", which university and academic environments primarily use. Indeed, as it has been previously discussed, the University owns a central role in Innovation processes (also in social innovation ones) and "*had become the epistemological center of practice and training ground for all practitioners*" (Waks, 2001: 39).

For example, Desis (Design for Social Innovation towards Sustainability), a Network composed by higher education institutions or Universities in design disciplines, sees in education institutions a significant driver for the application and diffusion of social innovation values and practices through education and research activities.

The definition of Design for Social Innovation partly coincides with that of Participated Design (Manzini & Rizzo, 2011):

- both are composed of extremely dynamic processes that involve moments of co-design, consensus building, and more complex and contradictory activities;
- designers play the role of facilitators and mediators, but also include creation and implementation initiatives that envisage many other design skills;

- the planned co-design activities are complex and require a series of ad hoc conceived and designed artifacts.

In the following section, I am going to focus on the increasing centrality of users in production and consumption practices; this change in the role of consumers has profoundly influenced design strategies, especially for social innovation and sustainability purposes.

3.3. Innovative "consumers"

Sennett identifies "consumption" as one of the elements characterizing the New Capitalism culture, and he stresses its pervasiveness and transversality through numerous areas of social life. Consumption is declined in different ways, from politics to the economy to the intimate life spheres. In his view, the voracity of consumption leads to dangers for the ever-increasing yield of new pieces of stuff, as also Molotch warned (2003). Consumption choices and actions convey different typologies of information, linked to power (possibilities of consumption are not the same everywhere and for everyone), belonging to specific cultures and sub-cultures.

There is a bi-univocal relationship between consumers and goods. On the one hand, consumers' behaviors are stimuli for new products that designers and producers adapt to new tastes and needs; on the other hand, designers and producers create objects which can support (good) social practices (Molotch, 2003). Consumers, as singles or in groups have gained (or at least are allowed to gain, thanks also to the Internet) knowledge and interest in the conditions under which their goods are produced and the effects these goods provoke.

In this perspective, the role of the so-called Critical Consumption is significant; it is a mode of consumption influenced by the acquisition of consciousness on certain situations/facts, such as the production processes. Critical consumption is ethical, responsible, and sustainable consumption that approaches the sphere of the Social, Sharing, and Circular Economy; in general, collaborative consumption models and experiences enable access over ownership, focusing both on what and how we consume. The importance of consuming local, for example, of inquiring about how, where, by whom, and under what conditions consumer goods are produced can lead to the choice of boycott unsustainable products and *buycott* (Friedman, 1996) sustainable ones. "*Boycotting refers to abstaining from buying, whereas buycotting refers to intentionally purchasing a product on the grounds of political, ethical or environmental motivations*" (Yates, 2011: 192). This

means that consumers can (as well as designers) collectively ask companies and governments to meet and respect all the different sustainability requirements. This is why Critical Consumption is generally described as a 'new' form of political participation (Yates, 2011).

As previously discussed, we (as citizens of the world) are more conscious of facts that danger our societies. Thus, we can be more aware of our consumption choices, even entering into production processes ourselves. People's skills and interests in acquiring knowledge on these issues, their (economic) capabilities and possibilities to satisfy basic needs, clearly enter this decision and participation processes. However, we are not going to address this complex topic here.

Figure 2 - Olives harvest, Tuscany. CC BY-NC-SA 2.0 Carla Sedini

The contribution of Alvin Toffler is particularly relevant to support this view since, already in 1980, he theorized the figure of *prosumer* as an emblem of postmodern consumption.

The term prosumer comes from the union of "producer" and "consumer"; these two roles are active in equal measure. New technologies have, of course, much favored the distribution of knowledge (defined *à la* Castells), skills, and productive capacities.

The prosumer is similar to the figure of Consum-Author (Fabris, 2008; Morace, 2008). This new way to consume establishes a function that has to do with social processes of meaning construction, as Codeluppi also states (1992). Therefore, consumers are innovators themselves; users of products and services are increasingly able to innovate for themselves, activating the so-called user-centered innovation (von Hippel, 2005). The term "lead user" (von Hippel in 1986) usually has and implements ideas for new or improved products/services, which are then discovered and capitalized by firms.

Collective actions of innovation, oriented for example towards a critical approach to the market, are instead defined as Grassroots innovation: "*a network of activists and organizations generating novel bottom-up solutions for sustainable development and sustainable consumption; solutions that respond to the local situation and the interests and values of the communities involved*" (Seyfang & Smith, 2007: 585). Grassroots innovation is more effective because – in light of what was previously discussed – the impacts that a critical mass can have on institutions and firms can definitely be higher than those of single users. The so-called Fourth Industrial Revolution (Schwab, 2016; Gilchrist, 2016) has profoundly influenced the creation of new possibilities of engagement of a plurality of actors thanks to the presence of increasingly accessible networks of technologies and places where to design, produce, and distribute innovative goods and services (Shirky, 2011; Von Hippel, 2016). Makerspaces and Fab Labs, for example, working also in strict connection with universities, can act both as production and learning spaces of Open Innovation. And also, organizations worldwide are experimenting with open-source software development, agreeing on universal technical standards, and using technology to build previously impossible en masse collaborations that create entirely new products and services[1].

Sustainable innovation is, therefore, a social process of learning (Manzini, 2003). In this view, actors' role as users, consumers, or – especially when we talk of social innovation – citizens is particularly relevant.

1. https://media.nesta.org.uk/documents/connect_collaborate_innovate.pdf.

Box 1 – Made in Milano/Made in Chicago[2]

The research Made in Milano/Made in Chicago was the first collaborative study developed by two interdisciplinary teams of the School of Design of the Politecnico di Milano and the Institute of Design of Illinois Institute of Technology of Chicago within the Sister Cities Policy Program. Civic Design has been the topic chosen for this collaboration, and the research teams decided to analyze it through a focus on the local economy (in particular manufacturing), innovation, and social inclusion.

"Making" and the Fourth Industrial Revolution has been extensively investigated in the last few years by academics, journalists, politicians, and have also raised the interest of many entrepreneurs and passionate people. Several pieces of research have been developed on the topic of fab labs networks and makers movement; in many cases, these studies highlighted problems of economic sustainability of these activities, but a more cultural-related role of these places emerged (Wang *et al.*, 2015; Taylor *et al.*, 2016; van Holm, 2017). Indeed, "*For makerspaces to become similarly ubiquitous and sustainable platforms, they need to offer the kind of institutional stability that will support meaningful community programming, educational opportunity, and grassroots economic growth. A glance at the history of makerspaces illustrates both the challenges and opportunities of building communities, and businesses, around the ethos of shared making*" (Holman, 2015).

In order to theoretically frame the study Made in Milano/Made in Chicago, we took into consideration the social and cultural side of "making". "To make" (fare), in Italian, is often associated with the concept of capability, of "being able to make" (*saper fare*). These capabilities are both objects and contents of places such as makerspaces and fab labs, but also districts, regions and even nations are often recognized as repositories of specific making/artisanal cultures.

Makerspaces and fab labs, specifically, are not only connected with the physical production of goods, but also with the production of knowledge and relationships, which sometimes are expressed through the physical production/practice.

In order to define our field of interest, we connected making with knowledge and social inclusion issues, identifying several pieces of evidence:

2. Retrieved from Sedini, C. (2019, November). Making the difference through design. In *Conference Proceedings of the Academy for Design Innovation Management* (vol. 2, n. 1, pp. 976-988).

- production is an urban and cultural fact, which is able to re-signify places;
- in many cases, makerspaces and fab labs are located in peripheral areas because of the availability of empty and large spaces, and because there are more accessible areas compared to city centers. The localization in the suburbs often contributes to the physical and cultural regeneration of these areas. This aspect is particularly evident in Italy and especially in Milan (Armondi & Bruzzese, 2017);
- rediscovering craftsmanship means to uncover a deeper relationship between people and their work (Friedmann, 1987). We assist nowadays to a new idea of craftsmanship, which owns a renovate dignity and value (Sennett, 2008);
- craft knowledge is based on mutual, learning, cooperative, collaborative connections, and development of dialogic competences (Sennett, 2008).

Studies and research developed within the Design Department of the Politecnico di Milano by Stefano Maffei & Massimo Bianchini, directors and founder of POLIFACTORY, were particularly interesting for their analysis and reflections on the urban dimension of the phenomenon. They developed the idea of micro-urban manufacturing applying to it the concept of ecosystem (Maffei & Bianchini, 2013; Bianchini *et al.*, 2014). At a national level, in 2015, with other scholars, they produced the "Maker's inquiry" (Bianchini *et al.*, 2015), with the purpose of studying and analyzing the makers phenomenon in the Italian context. They investigated also the economic sustainability of the sector discovering that the majority of makers (54.4%), who participated in the survey, confirmed that making was a secondary and complementary economic activity; in addition to that, the majority of respondents (36.5%) declared an income range between 10,000 and 25,000 euros per year, and on the other hand, 23.1% of them declare an income between 0 and 10,000 euros. Inside the Department of Architecture and Urban Studies (DAstU) of the Politecnico di Milano a research group, coordinated by Ilaria Mariotti (Armondi & Di Vita, 2018), carried out a FARB project called "New Working Spaces. Promises of Innovations, Effects on the Economic and Urban Context". The importance of the political framework, in which the investigated phenomena takes place, was particularly relevant in this research; indeed, one of the main focus and result is about the regenerative capabilities of these new working spaces, which often substituted old typologies of production. The research used the interesting interpretative category of proximity, proposed by Ron Boschma (2005), who analysed different typologies of proximity (cognitive, organizational, social, institutional and geographical) and how they might influence learning and innovation processes.

Professors and researchers in Sociology (mainly from The Sociology and Social Research Department of the Università degli Studi di Milano Bicocca) stressed the current re-specification and re-signification of the manual and productive work focusing also on the cultural value of makerspaces and fab labs, which actually seems to be the most important value if compared with the economic one (Colleoni, Vicari Haddock & d'Ovidio, 2015; d'Ovidio & Rabbiosi, 2017). In addition to that, a research carried out in collaboration with cheFare and Fondazione Feltrinelli, "broke" the wall which separated culture and production, developing an analysis of 6 different case studies which involved both cultural and art spaces, makerspaces and fab labs (Giuliani, 2018).

To conclude, I want to mention a project which wasn't developed within academy: SUPER – II Festival delle Periferie (The festival of the suburbs)[3]. We had the opportunity to discuss and involve their initiators and researchers in order to compare our projects since they had several points of contact. In particular, we were interested in their idea that peripheral neighborhoods of Milano are important pieces of the whole Milanese ecosystem, and, in the strong connection between culture, making and social innovation, which they wanted to highlight thanks to the organization of workshops and events around the city.

In light of the core concepts, which emerged from the research listed above, we decided to look at "making" in a wider way or in an "open" way as Sennett suggested (2018). Indeed, making is not only oriented towards utilitarian purposes but also towards sociality goals (Sennett calls it "limited fraternity" relationships) favoured by processes of co-creation, collaboration or even by the possibility to meet and interact with other people in the same (physical) place (Fassi & Sedini, 2018).

In line with Molotch view, there could be then the chance that also the production of goods (and I am not referring to GDP production) might be able to sustain positive and innovative social practices, looking in particular at inclusivity.

One of the main results which we gained was that in a complex society, where traditional forms of economies are shrinking, the creation of hybrid activities is needed not only for the economic survival of citizens but also for their social support and – in general – for a wider wellbeing. In order to be functional, sustainable and prosperous these kinds of economies need to be based on a strong sense of community, sharing of values and – therefore – networks. Within this framework design, which actually deals with complexity, plays

3. https://iosonosuper.com/english.

an important and multiple (or hybrid, as well) role and resulted to be both a driver and a possible content to support and create these forms of economy.
Many of the interviewed realities are directly or indirectly connected to sustainability in terms of products, services, activities, vision and mission, but also in terms of personal commitment of workers. Indeed, the idea of producing and offering only what is needed is crucial within maker and artisanal culture, that is the production of a few pieces, following a different timetable compared to GDO or big retailers. Customization plays a crucial role in these economies, which are flexible and offer products that can better satisfy the customer's requests.

"*Based on the required musical instrument, we decide who will mount the piece. We have master builders and luthiers whom we refer to. So, the concept of fluidity based on the client's needs returns and, by doing so, you are even more effective in the relationship with the customer".* Guitar artisan

"*I am close to the concept of a bicycle created specifically on the customers' needs*". Bicycle artisan

"*Rather than having 8000 pieces, which pollute and are a 'more' in the world, maybe we could invest in one piece that has a history, an emotion, a preciousness not only in the material but also in the project behind it*". Jewellery artisans

In addition to that, social issues are often at the core of the mission of our interviewees' activities. Some of them are focused on empowering marginalized people. Sometimes, people who lost their jobs or just wanted to change it, after participating in courses or activities promoted and conducted in these places, had the opportunity to reinvent themselves.

"*We have projects in collaboration with refugee tailors. One is an Afghan tailor, since he knew how to make shirts well, we did things together. Now he has his private clients*". Bottom-up union focused on tailoring

The majority of the realities we interviewed is located in a peripheral area of the city. The impact on the neighborhood is for sure a goal which was imposed by local administration, e.g. lowering the prices of some locations, launching calls for the renovation of buildings, etc. or in other cases the interviewees wanted to stay in a specific area because they saw the possibility of networking and to contribute to the identity of that area.

"*We had a role in showing that it was possible to make Bovisa [ndr a Milanese peripheral neighborhood] a Fuorisalone district*". Makerspace

Hybridity of goals led to hybridity of impacts. The main (hybrid) goal declared has to do with sustainability: both environmental, social, and economic. The creation of networks might be an explicit goal itself and, together with a strategic design approach, also a means to acquire those goals.

"*We are in connection with the school in Barcelona. Among the many ideas we have there's that of creating a network. We are also connected to a laboratory (like ours) in Florence. Tomorrow I go to Istanbul to meet a historical engraver-goldsmith of the Grand Bazaar. We are in the seeding phase*". Jewelry artisans

3.4. Participation "mantra": engage, empower, design!

As previously discussed, designers recognized and favored the changing role of customers and users; there has been a shift from designing for users to designing with users who become co-creators. This new design and innovation paradigm is different from the so-called aesthetic or market-driven, where users are defined as consumers since they play a passive role (Whiteley, 1993; Thorpe & Gamman, 2011). Socially useful design paradigm, instead, is oriented towards social change or by social needs and users are supposed to play more active roles (Murray, 2009; Melles, de Vere & Misic, 2011; Thorpe & Gamman, 2011).

Designers moved from being solutions-developers for people to professionals creating with people (stakeholders), thus allowing non-professionals to design by and for themselves (Brown, 2009). In participatory experiences, the role of designer-researcher emerges, and users become an essential element of the process (Sanders, 2002).

The participation of all stakeholders in the design process even if re-emerged (after the Participatory Design momentum in the '70s) for business purposes, later on, was understood to be very relevant for non-consumerist goals and social purposes.

The key principles of participatory approaches are: "*Involving people as subjects not objects; Respect for local knowledge and skills; Ensuring influence over development decisions, not simply involvement; A learning*

process as much as an outcome; An approach and attitude rather than a specific set of technical skills" (EU Commission, 2004: 118).

VanPatter and Pastor (2016) identified six distinct areas of design study and application which involve co-creation practices:

- Creative problem solving.
- Design process models.
- Product design.
- Service design processes.
- Organizational innovation.
- Societal innovation.

In particular, co-design processes, based on iterative cycles of understanding, ideating, prototyping, and verifying, support the whole span, which goes from ideation to implementation. In co-design processes, *diffuse design* and *expert design*, as Manzini (2015) stresses in his book "Design when Everybody Design", meet and collaborate. Expert designers own tools and a specific culture (design knowledge); nonexperts (diffuse design) own experience, knowledge, and information. During the conduction of co-design activities, these two main actors share their resources.

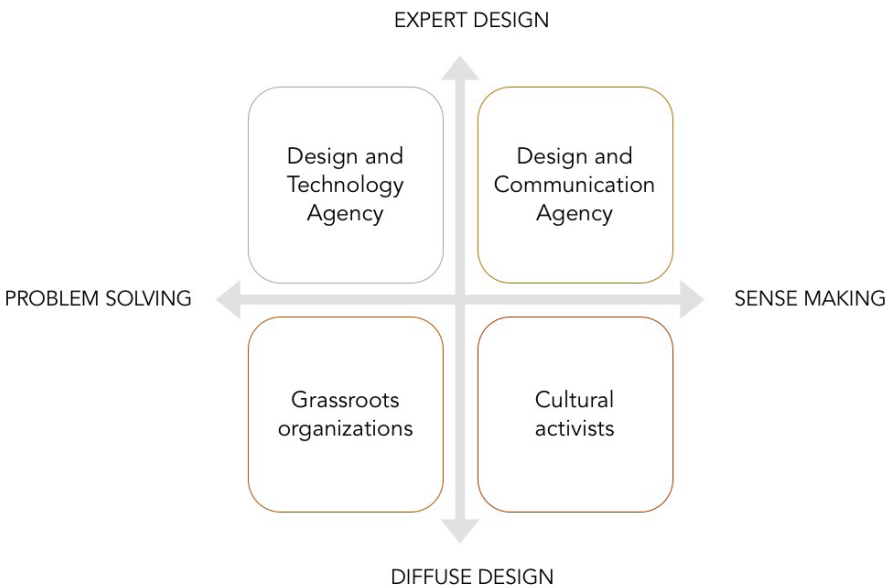

Figure 3 - Design mode map by Ezio Manzini. Elaboration by the author

According to Meroni (2008), a community approach is needed to look specifically at co-design processes for social change and innovation. We can state that in social innovation, the "good cause" can favor the creation of a community. Meroni talks about Community Centered Design (CCD) an evolution of user-centered design approach. "*CCD is not focused on the single user but on the entire community as the enabler of local change, as a resource to be valued and from which to learn. Working with such an approach, design professionals are required to have two main competences: on the one hand, the ability to gain knowledge on the community through field immersion and to develop empathic relations with its members; on the other, to use design knowledge to design with and for the community, developing tools to enable the co-design of new solutions coherent with the context and allowing non-designers to apply their knowledge and professional skills to the issues discussed*" (Cantù, Corubolo & Simeone, 2013: 2).

Participatory design has changed, and it will probably continue to change, shifting toward firms to the public sphere and the public interests. Nowadays, co-design is a super-hybrid concept that draws on (Evans & Terry, 2016: 244):

- "*product design thinking*" is devoted to solving design problems and refining existing products or inventing new ones;
- "*assumption about what works in combating social exclusion in social policy*";
- "*normative social science that focuses on identifying and removing barriers to citizen participation in society*";
- "*the practice-based literature on social innovation, which stresses processes of co-design, co-production and co-creation*".

Participatory productions include, for example, open innovation and Living Labs, peer-production and maker spaces, public participation, and social innovation (Bannon & Ehn, 2012). Whatever forms co-design takes, its activities must be designed according to the desired results. Meroni *et al.* (2018) identify two main perspectives that influence one another: the impact of co-design processes on participants and the quality of the outputs actually generated.

To sum up, participatory processes and activities need to be thought (designed) according to their ultimate goal. Engagement is always a goal in co-design processes oriented towards social (innovation) matters. Indeed, as it has been previously discussed and explained in Box 2, the establishment of networks among stakeholders, which do not easily meet and

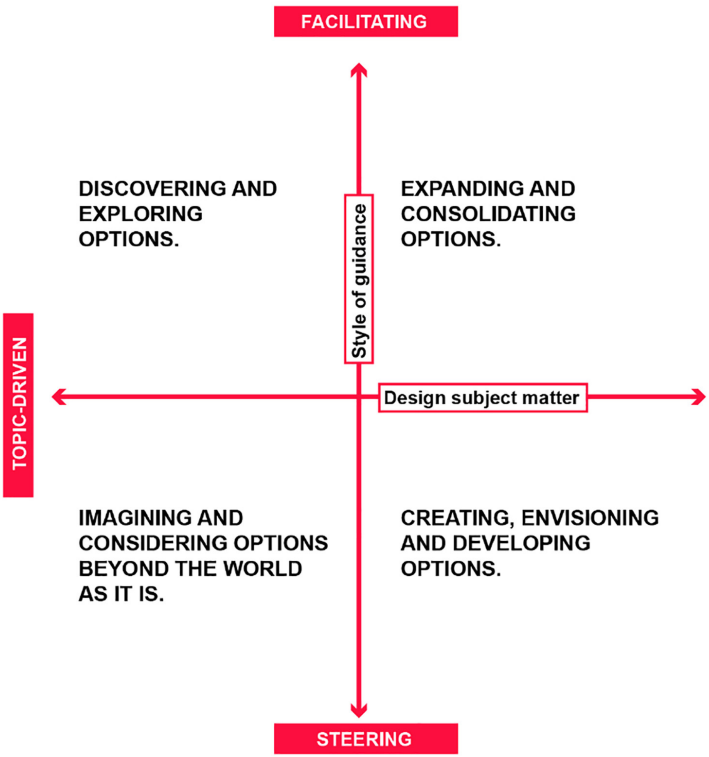

Figure 4 - The Collaborative Design Framework (Meroni, Selloni & Rossi, 2018)

share their opinions, is already something of great value. Engagement is becoming a necessary practice for the achievement of high standards in quality of life. In addition to that, engagement can result in empowerment for several reasons, and in particular, because more and more co-design activities are oriented to share and convey knowledge. This can be related to the discussed issue but also on participatory methods, tools, and, in general, activities, which can be taken as an example and eventually replicated by participants for their own goals.

Another objective is that of actually co-design a solution. However, as I will discuss in the following chapter, designers' role for this purpose is very important to meet all the requirements that the design of a solution has to satisfy. Social innovation solutions are not necessarily framed outside the market. For example, interventions of recovery and functional redefinition of farmsteads (*cascine*), social housing projects to give access to the real estate market and to improve deprived areas of the city, use

of kitchen gardens as educational tools in schools and as instruments of empowerment, collaboration and improvement of urban areas (Fassi & Sedini, 2017; Fassi & Sedini, 2018) are often hybrid activities to be collectively designed.

The challenged topics are very relevant in defining the main target of interest and, consequentially, other essential stakeholders that need to be involved in the process. This means that the designer-researcher must own previous knowledge of the topic, especially on the reference community's width. Preliminary desk research activities precede, therefore, the organization of a co-design activity.

Even if social innovation mainly concerns large groups of people, I think that nowadays, we (as researchers) are asked to continuously move from a large to a small scale and vice-versa. This is important to really include in these processes communities that might be small or facing particular issues and problems, demonstrating so the idea of *well-being scalability.* As members of society, we can understand that, very specific problems challenging definite groups of people are our own problems and the benefits that could emerge (also) through co-design and participatory approaches that might improve the overall quality of life even if responding to (very) specific needs.

Last but not least, time is a critical variable. Trust development is particularly crucial in co-design processes, and it requires time. Some institutions, such as Universities, might already own a good reputation, which is useful, for example, in engaging policymakers or entrepreneurs. Citizens, as well, might be more secure of participating when well-known institutions are involved. However, in some specific cases, an educational institution, such as the University, might be "repulsive" for people who perceive these as very distant from them, from their lives and interests. Nowadays, there is new negative rhetoric around "knowledge people" and institutions which might not favor – in some cases – the involvement of participants. Participants have to be somehow committed through time, and this leads us to an – obvious – critique of co-design and participatory process: who participates?

In most cases, citizens who participate in these research experiences are already engaged, not necessarily as active members of/in the society at large, but they probably are already part of groups and associations dealing with the issue that it is "on the table".

The great challenge for design-researchers should be to engage those citizens who do not think to have a voice or at least an opinion that is worth being heard. At the same time, socially responsive designers need to be aware of their limits, which means that they have to address the

"*societal change with available collaborators and resources, and settling for the best that can be achieved in a particular context*" (Thorpe & Gamman, 2011: 227).

In the following two last chapters, I will present two research pieces that are both focused on social innovation and co-creation practices. I will present them according to the social innovation area of interest, the research process, and special attention to participatory activities.

The first project is *SISCODE – Co-design for society innovation and Science*, and I am going to focus on the pilot project carried out by Polifactory, the makerspace and Fab Lab of the Politecnico di Milano. The second project is *LONGEVICITY – Social Inclusion for the elderly through walkability*, which will be focused on the research activities carried out by the Design Department of the Politecnico di Milano.

Box 2 – The concept of Social Capital[4]

The concept of Social Capital has been used by several disciplines in order to study, discuss and analyze the creation of community networks, the achievement of economic success, and the support to local development. Its definition has been changing over time and often has been taken for granted; however, a unique definition of the concept is not possible and also a complete overview of it cannot be the main focus of this paper. Therefore, in this first paragraph, a possible composed definition which could be useful and effective for the present argumentation is going to be delineated.

The definition proposed by Jane Jacobs (1961) was related to two main levels of manifestation and impact: the individual/personal level and the territorial/urban level. She stated that Social Capital is created and reproduced thanks to the presence of informal relationships, local self-government networks, neighbourhood associations.

The importance of factors such as proximity, on the one hand, and informal networks, on the other, are already present in Jacobs dissertation. By proximity I do not mean only a physical-geographical proximity, which is a condition, but not a guarantee, for the presence and the development of cognitive, organizational, social and institutional proximity (Boschma, 2005); while, for informal networks, the concept of weak ties proposed by Mark

4. Retrieved from Sedini, C. (2019, November). Making the difference through design. In *Conference Proceedings of the Academy for Design Innovation Management* (vol. 2, n. 1, pp. 976-988).

Granovetter (1973) identified a relationship which is nor of kinship or friendship, but which is expressed in a combination of trust, (non-economic) exchange and reciprocity. These two elements (networks and proximity) are very much connected, indeed networks have a variable length: they can be very local, but they can also extend to the whole city.

The most well-known scholar who theorized the concept of Social Capital, is probably Pierre Bourdieu (1980) who analyzed it in connection and interaction with other types of capital (economic and cultural) and defined it as the set of real or potential resources that depend on the possession of a lasting network (of relationships) and of more or less institutionalized relations founded on high levels of respect and reciprocity. Therefore, as mentioned before, the utility of Social Capital is recognized at two levels, which are simultaneously separated and connected: the personal and the collective. Social Capital supports individuals in solving everyday problems, such as finding a job; at the same time, by doing so, it can generate broader positive effects on the city and beyond. According to Enzo Rullani (2006) Social Capital is embedded and rooted, often implicitly, in territories. This approach clearly states the shared and collective nature of this resource, which is particularly useful for the attainment of economic and social improvement of places. As far as the economic competitiveness is concerned, for example, the importance of Social Capital has been widely discussed in the constitution of districts, first industrial, then cultural and creative (Becattini, 2000; Scott, 2006). As the shared value of Social Capital is concerned, Arnaldo Bagnasco (1999) analyzes what Robert Putnam called *civicness*, that is a fabric of values, norms, institutions and associations that permit and support civic engagement, mutual trust, and widespread tolerance, where the interest is no longer (only) private and personal but becomes public. The possibility that a culture of *civicness* found fertile ground is directly influenced by the presence of high levels of Social Capital. According to Putnam (1993), the possession of Social Capital can directly have a positive impact on a territory (nation, region, city) and on the functioning of its democratic institutions; therefore, territories need strong social participation to attain certain levels of efficiency. Putnam developed this statement thanks to Tocqueville's work on civic participation in America in the 1830s; however, as Ferragina (2012) highlighted, Putnam did not consider Tocqueville's main explanation about the conditions which allowed high levels of social participation at that time in America, which was the widespread condition of equality in comparison with other countries.

4. Co-designing with vulnerable social groups: BODYSOUND pilot project

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Polifactory, Politecnico di Milano

SISCODE, Co-design for society innovation and Science[1] is an EU-funded project aimed at stimulating the use of co-creation methodologies in policy design, using bottom-design-driven methodologies to pollinate Responsible Research and Innovation, and Science Technology and Innovation Policies. The Design Department of the Politecnico di Milano leads the project, and a multidisciplinary consortium of institutions participates in it. This partnership brings together 17 organizations with extensive networks, world-class research experience, policy expertise, and a proven track record of collaboration in complex projects' implementation. The project consortium runs European wide research to understand the dynamics within these co-creation environments and the outcomes we can obtain from such approaches.

Ten co-creation labs spread around Europe are working with design-driven approaches to co-create, generating real-life knowledge. They had to select a challenge to tackle with local stakeholders in order to find solutions together. Polifactory, the makerspace and fab lab of Politecnico di Milano, is one of the ten labs carrying out a pilot project. In the journey, all labs identified a social challenge to work on through the whole span, from research to prototype.

Polifactory team decided to face healthcare and wellbeing issues, paying keen attention to materialization (prototyping objects and tools) as an effective way to share information about design, its purposes, and uses. It is also useful to investigate and develop new design concepts, acquiring knowledge about relevant phenomena in design, with particular attention to prototypes as experimental components, means of inquiry,

1. https://siscodeproject.eu/about/.

and research archetypes (Wensveen & Matthews, 2014). Prototypes have been used as boundary objects (Star, 1998; Star & Bowker, 1999) to stimulate communication and conversation and manage different viewpoints.

BODYSOUND pilot project implemented and used tangible technologies and interfaces at different stages of co-design with patients and caregivers, as we are going to discuss in the following pages.

4.1. The social challenge

In the complicated and broad realm of healthcare, the Polifactory team decided to consider rare conditions, for several reasons:

- often rare diseases and conditions are not sustained by the public welfare system;
- informal caregivers are nor supported or trained in the management of their relatives' problems;
- Rehabilitation and cure processes and environments are often unfriendly;
- collaborations between makerspaces/fablabs and innovative users in the medical field are very important, because "*Research has shown that many users 'drop out' of the innovation process before having realized a prototype and may be doing so too early for what is socially optimal, leaving potentially valuable ideas undeveloped*" (Svensson & Hartmann, 2018: 278).

To more specifically frame our challenge, we had to identify a rare condition to design for. In order to do that, we carried out an analysis of Patients Associations to be involved in our journey. Our analysis was based on five main variables:

- representativeness: type of pathology and the number of patients represented by the association;
- operability: local action capacity and distribution throughout the country;
- skills: design and communication skills owned by the association, which would be suitable to participate in the pilot;
- experience: participation in previous co-creation initiatives in collaboration with designers e policymakers;
- motivation: commitment and effort in the active participation in the pilot activities.

After a brief review of Patients Associations which could be involved in the project, we selected FightTheStroke (FTS)[2]. FTS is a social promotion association responding to the needs of families whose child was impacted with a stroke or cerebral palsy. It educates on the awareness that children, even the unborn ones, can be affected by brain damage, encouraging research and adopting 'disruptive' therapies for people with a neurodevelopmental problem. The collaboration with the association, which was our prior initiative, was crucial to know the issue better and contact families and therapists.

Looking specifically at our issue, we run desk research to get comprehensive knowledge on children's stroke and cerebral palsy.

Looking at data on Cerebral Palsy (CP): 2 to 2.5 per 1000 new-born and children are affected by CP (esteem of 3 per 1000 in Milan); 17 million people across the world live with cerebral palsy (CP); 350 million people are close to a child or adult with CP.

"*It's a myth that only older adults have strokes. (…) The risk of stroke in children is greatest in the first year of life and during the period of right before birth to right after birth*"[3]. Indeed, CP is the most common physical disability in childhood, probably because of the term groups together a set of ailments. Specifically, it is a permanent condition due to brain damage, which happens during the mother's pregnancy in the case of children. According to the seriousness and the expansion of the damage, CP will be already detected in the first 12-18 months after birth. It will have different consequences on the health and well-being of children. In 40% of cases, motor disability is registered, and it usually affects the left of the right side of the body (spastic hemiplegia) in more or less severe ways. Symptoms may also include slurred speech or difficulty with language, trouble balancing or walking, cognitive deficit, epilepsy, and many other problems that change from child to child[4].

To start our relationship as researchers with our main target and get to know them more directly, we decided to launch an online survey.

In three days, we collected 71 responses from parents of children with CP, and this was already an element that gave us the perception of parents' significant commitment.

2. fightthestroke.org.

3. www.stroke.org/understand-stroke/impact-of-stroke/pediatric-stroke/.

4. www.hopkinsmedicine.org/neurology_neurosurgery/centers_clinics/pediatric-neurology/conditions/pediatric_stroke/index.html.

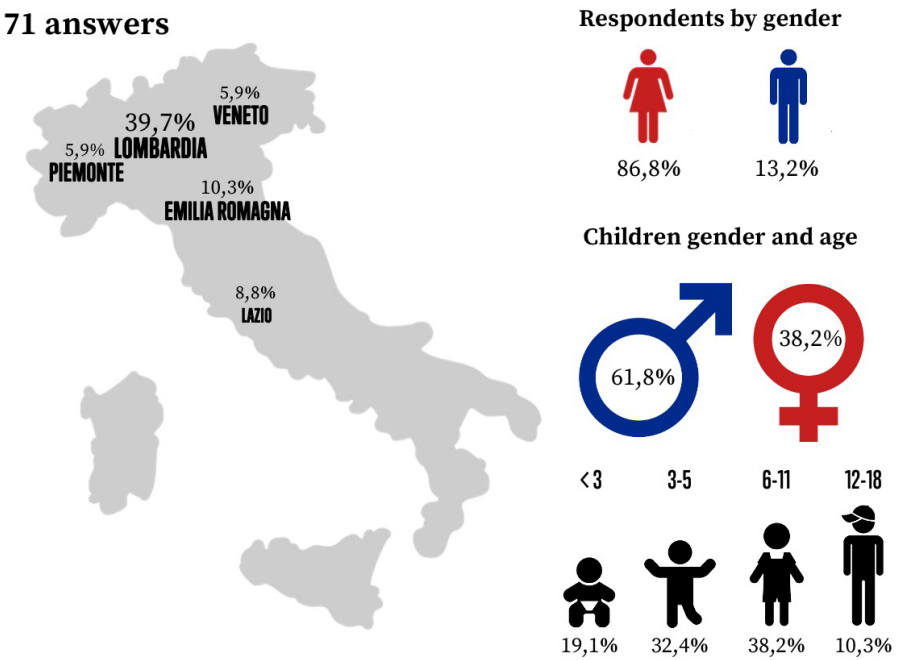


Figure 1 - Survey results, BODYSOUND pilot project, Polifactory, SISCODE

Respondents said that their children have reduced motor and coordination skills (97,1%), speaking/language difficulties (50%), epilepsy (36,8%). Deficits are concerning one arm (57,4%), one leg (44,1%), both legs (42,6%), balance (51,5%) and that their children have to use assistive products: leg/foot orthosis (61,8%), wheelchair (32,4%).

We report the other results concerning the moment when the CP happened, the activities which are somehow difficult for the children, the places where they feel more or less comfortable, and the physical activities they usually perform, in the images below.

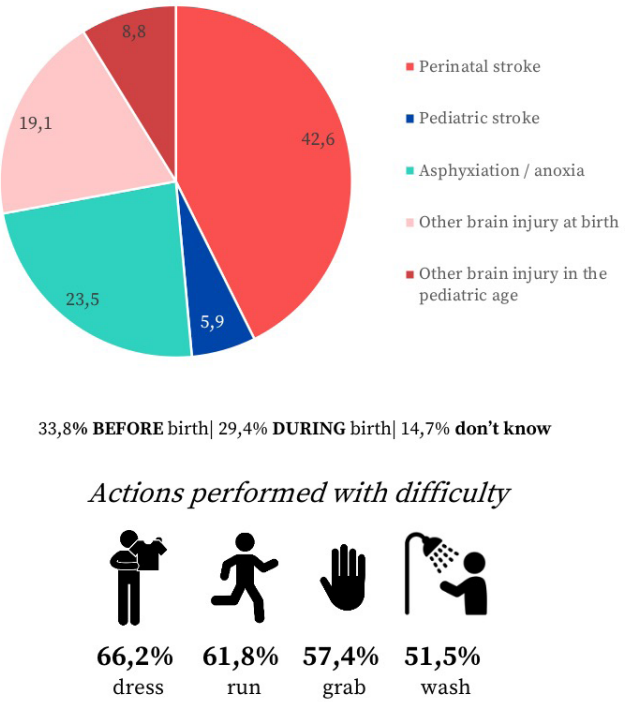


Figure 2 - Survey results, BODYSOUND pilot project, Polifactory, SISCODE

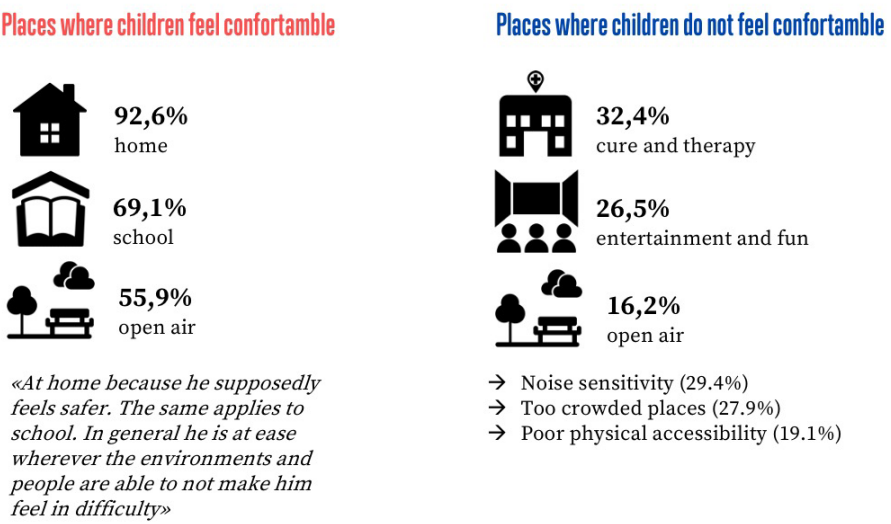


Figure 3 - Survey results, BODYSOUND pilot project, Polifactory, SISCODE

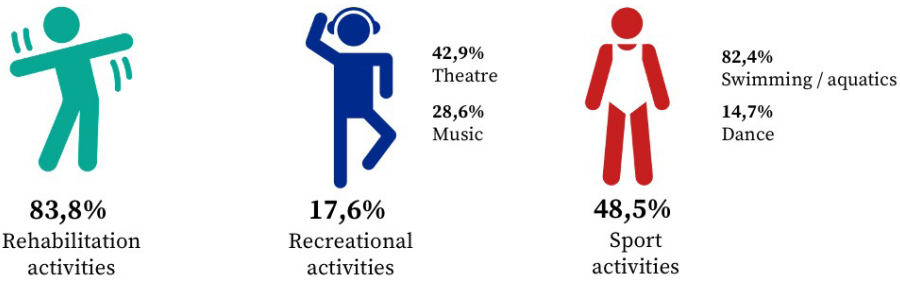


Figure 4 - Survey results, BODYSOUND pilot project, Polifactory, SISCODE

It is important to stress that more than 90% of respondents declared to be interested in being involved in co-design activities, even if they did not have any experience of this kind before (67,6%).

In collaboration and consultation with Francesca Fedeli, president of the association FTS, we decided to call our pilot project BODYSOUND, which would have to be based on the relationship between music and movement to explore the physical aspects of music starting from the principles of proprioception.

In the following section, we are going to give a general overview of the experimental participatory activities that we have been carrying out during our co-design journey. Our explanation will not be exhaustive of the whole complex journey; however, we will focus on the research activities that engaged parents (caregivers) and children.

4.2. Co-designing for and with children with cerebral palsy: first round

Our experimentation phase started in May 2019; since then, we run:

- two co-design sessions with caregivers (parents of children);
- one co-design activities with all relevant stakeholders;
- consultations with policymakers;
- several and diverse experimental and testing activities (still ongoing).

We have decided to dedicate two co-design workshops only to parents. This decision, even if it did not respect the SISCODE project's requests, was due to the topic's sensitiveness. As design-researchers, we had little knowledge on the topic, and caregivers (parents) did not know Polifactory. We decided to "leave space to them", to create a protected environment to meet each other and build trust among the two groups: parents and researchers. The role of mediation played by the FTS association was crucial to creating a common field of conversation.

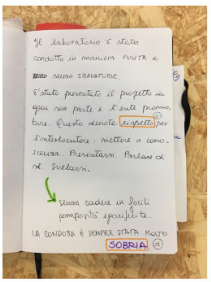
Eleven members of the association FTS participated in the first workshop (ten caregivers and one adult patient) supported by four designers from the Polifactory team. They participated in the first co-design session, which lasted 4 hours and was organized in four main moments:

1. introduction. Quick presentation of Polifactory and SISCODE, and we launched the brief;
2. needs. Starting from personal stories and the questionnaire's results, we identified both needs and design opportunities;
3. inspiration. We developed a set of inspiration cards composed of a selection of case studies that are particularly useful to understand technological potentialities;
4. warm-up + idea generation. Starting from a selection of some evocative images useful to recall: Scenarios/mood; Technologies; Devices, participants visualized some possible solutions.

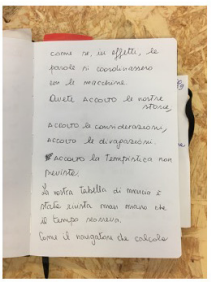
SISCODE project provided the experimenting labs a set of tools and inspiration to run the whole journey with specific attention to co-design sessions; indeed, one of the project's main objectives is sharing knowledge on co-creation also with non-experts in the field. Polifactory internal skills and long experience in design and co-design processes allow us to be able to intervene on these tools to adapt them to our specific purposes.

The Needs phase was the most relevant one for the reasons mentioned before. Indeed, as researchers, we decided to listen to all the different stories, without interrupting. This obviously led to be late in the timetable. However, during the narration of very personal and intimate stories, our researchers were able to identify keywords, collect useful information and resources to converge in the following co-design phases. We might say that this was a very intense moment both for parents and researchers, and this perception of closeness is well testified in the diaries that we used as cultural probes.

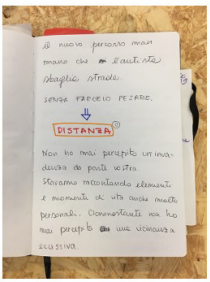
CULTURAL PROBE.
The diary of a participant in the first co-design workshop.



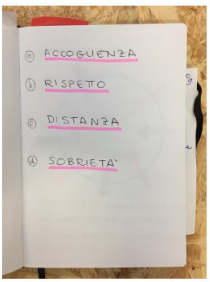
The lab (co-design) was conducted withouth any lapse. The project was clearly explained and this is a sign of respect for the people involved. Introduce. Talk about yourself. Reveal. Withouth falling into self-referenced pomposity. The conduction was also very SOBER.



As if words cohordinate with the machines. You WELCOMED our stories, our considerations, our divagations. You had to gradually review your timetible as the navigator calculates…



…a new path when the driver wrong the direction withouth let us feel unconfortable for this. DISTANCE. You had never been intrusive. We told very personal moments and elements of our life. But I never felt you too close.



a) WELCOME
b) RESPECT
c) DISTANCE
d) SOBRIETY

Figure 5 - Diary of a parent participating in the co-design session. BODYSOUND pilot project, Polifactory, SISCODE

During the third and fourth phases, participants were asked to work in smaller groups, taking a look at the inspirational cards we provided them. These cards (*boundary objects*) were reporting by inspirational projects dealing with music, dance, proprioception, disabilities, and inspirational images of scenarios, materials, environments, etc. After a rapid vision of these cards, participants had to formulate one or more ideas. We collected fourteen ideas, and they constitute the base for a pre-definition of BODYSOUND system' component.

In the afternoon of the same day, we met the children. We designed for them an experimentation lab, composed of four different activities based on four different technologies. Thanks to desk research and face-to-face meetings with experts (FTS association and the sound designer Stefano Ivan Scarascia), we understood that several products and services already exist. We also acquired knowledge on several music features and on the already existing design solutions for making music, amplifying, and diffusing sounds through solid objects. Therefore, we identified four main

Figure 6 - Activity during the co-design session. BODYSOUND pilot project, Polifactory, SISCODE

technological and musical tools to develop simple tests to experiment with children: the Kinect technology, the Theremin, the Makey Makey, and SoundMoovz bracelets.

As previously said, participants in both the co-design and experimentation lab were given a diary (cultural probes tool) to take notes and express their opinions and ideas about the brief and the rehabilitation and recreational activities attended by their children.

In total, eight children participated in the experimentation lab, and these are the main pieces of evidence collected through direct observation and the collection of cultural probes. These were the activities proposed in the first BODYSOUND experimentation lab:

- Shakeshake (using SoundMoovz bracelets): parents liked them very much because they are "portable", can be used everywhere, and are easy to use;
- Teremì (using the Theremin): easy to use; children like the sound produced;
- Gimmi5 (based on Makey Makey technology): easy to use also by little children;
- Kinny (based on Kinect technology): not very intuitive and easy to use, but when they understand how to do it, and they appreciated it; Kinect has difficulties in detecting children in a wheelchair.

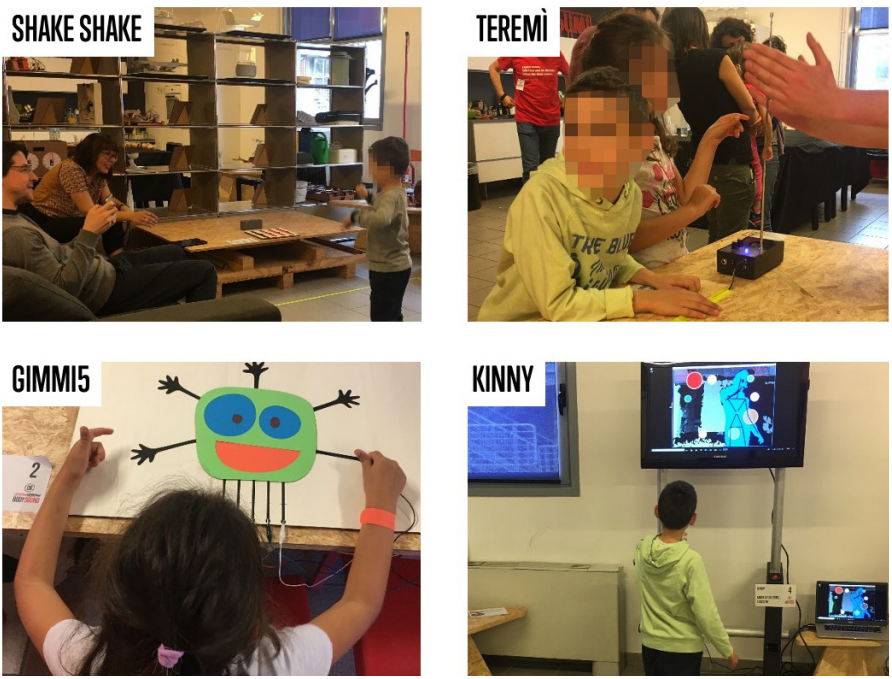


Figure 7 - BODYSOUND Experimentation lab with children. BODYSOUND pilot project, Polifactory, SISCODE

Between the first and the second co-design sessions, the internal team conducted several debrief moments. The proposed ideas were verified to be "new"; were then clustered according to three main design areas:

- the physical component of sound (haptic feedback);
- the body in space (body/space interaction);
- the body as a musical instrument (transducer).

Two main design dimensions:

- the inclusive dimension of the solution (designed for FTS children but usable and appreciated by all);
- the non-performative dimension of the solution (a different approach to the discipline: music/dance)

and three main characteristics:

- make music through a bilateral movement; since children with cerebral palsy diagnosis tend to move only and preferably the side of their body which was not compromised;
- experience music through the body (wearables) thanks to haptic feedbacks;
- use of the body to play music.

The first idea of BODYSOUND emerged.

BODYSOUND is a system of motor stimulation of the limbs based on the transformation of movement into sound. Within a sensorized room, children can move (either following instructions or freestyle) and transform their movement into sounds (or melodies). The room can detect the child's movement and send, through a wearable device, haptic feedback to guide him/her in the "right" execution of the movement.

The solution identified proposes the possibility of creating inclusive spaces and activities that are not directly connected to rehabilitation and therapy. The idea is to exploit a playful activity to endeavor the movement.

Thanks to several moments of exchange with the president of FTS, we verified the accuracy of our assumptions, according to legal, bureaucratic and professional constraints. For example, we cannot work on the development of healthcare products, which need a series of certifications impossible to obtain in time for the development of the challenge. The solution exploits sound as a motivational and inclusive element. Being children affected by cerebral palsy our main users, BODYSOUND will be based on a system of stimuli and exercises adapted for their needs (e.g. bimanuality, mirroring of movement, etc.). However, BODYSOUND solution can also be used by children who do not have this kind of pathology. Indeed, having fun (and not being bored), being challenged positively, and encountering other people (in this case children) can have very positive effects on their mood and somehow on physical improvements as well.

We decided to work on sports and play, focusing in particular on music; this choice was due both because of the previously mentioned limi-

tation but also because as The International Classification of Functioning, Disability and Health (ICF) from the World Health Organization, states that "a true and effective global takeover of the child must give importance to a series of factors, described through six simple words, the so-called 6 F-Words: function, family, fitness, fun, friends, future". This means that fun, and in general, these children's quality of life cannot be underestimated. As Dr. Peter Rosenbaum (from CanChild Association) states, "*It's been a very long road, but the focus is now 'functioning' rather than 'fixing'. Nowadays, we promote the idea of the best life possible being the best medicine for people with cerebral palsy*"[5].

4.3. Co-designing for and with children with cerebral palsy: second round

The second co-design session, held in June 2019, was dedicated to the first session participants. Four caregivers participated in it, and it lasted two hours. The workshop was organized in three main moments. During the workshop, we verified both opinions on the first co-design workshop and experimentation lab. In addition to that, we presented them the idea that emerged from the debrief activity to verify and refine it. In particular, they appreciated the systematization of several ideas together, and they were able to discuss barriers and opportunities for the solution. We asked them to focus mainly on the device and the guide for the movement. As the device is concerned, they suggested that it should be integrated into a piece of cloth, or it should be an accessory which the child could wear by him/herself.

As the guide to the movement is concerned, participants identified Motion Graphic as the preferable solution; however, different opinions about the abstraction of the visualization emerged according to the age and the physical and mental conditions of children.

In the image below, the collective storyboard is visualized. Participants could choose among different pre-identified solutions that the design team selected based on the debrief process and propose them.

For the second round of experimentation lab with children, we participated, in collaboration with FightTheStroke, in the Meet and Code days, on the occasion of the EU Code Week (October 2019).

5. https://worldcpday.org/our-campaign/medical-therapeutic/dr-peter-rosenbaum-the-best-life-is-the-best-medicine-for-people-with-cerebral-palsy/.

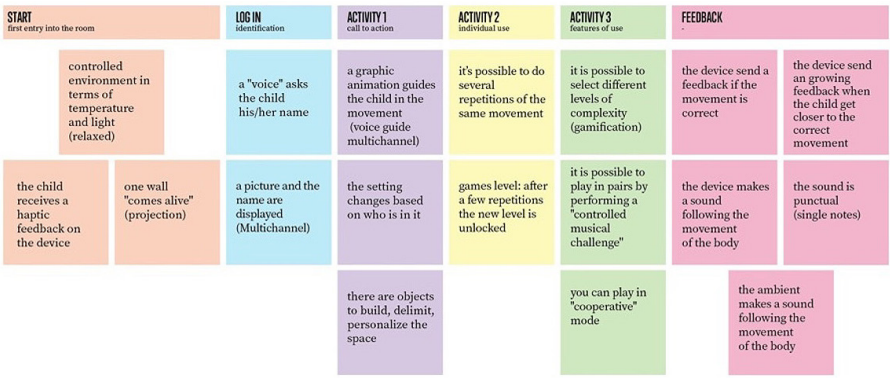


Figure 8 - Collective BODYSOUND storyboard. BODYSOUND pilot project, Polifactory, SISCODE

BODYSOUND' Experimentation Lab was developed around the theme "Technology and Inclusive Music" and it was hosted at Facebook in their Milanese headquarter. About twenty children participated in the Lab and the group was equally composed both by children affected by cerebral palsy and children who did not. All the children enthusiastically participated in all the proposed activities.

As for the previous experimentation lab, the process of children's involvement was based on designing and prototyping a series of tangible experiences, based on sound manipulation. Indeed, through the use of *quick&dirty* prototyping technology and experiments using prototypes as technology probes (Hutchinson *et al.*, 2003), the experience and comprehension of sound can also be facilitated via other senses, like touch or sight.

Children played three leading roles:

1. deejays: in pairs, they could interact with knobs, levers, rudders designed in connection with the synth version of littleBits. They activated the interfaces with both hands, interacting with two notes simultaneously to generate the most varied consonances and dissonances;
2. choreographers: in pairs, they could choose among different simple movements to guide the "dance" of the other children;
3. dancers: the rest of the children executed simple movements guided by the two choreographers and on the notes produced by the two deejays.

Figure 9 - BODYSOUND second Experimentation lab with children. BODYSOUND pilot project, Polifactory, SISCODE

The result of this second round was the idea of:

- a virtual system where gamification elements help the motor stimulation and – possibly – reactivation of the limbs;
- by encouraging the children/users to use and move the hemiplegic part;
- through the execution of a series of choreographies.

Guided by the game's visual interface, the child can perceive the movement performed and the position in the playing space through its own reflection in the monitor in the form of an avatar. BODYSOUND can detect gestures through a simplified motion capture system and return in real-time one or more sound feedback, producing a melody when performing the correct movement. The system uses a touchless technology (Microsoft Azure Kinect) for body tracking, although space coordinates and the angles between nodes of the human body, and an audio-video system in combination with a software developed by our team. Every function and interaction of the software (calibration, activity selection, degree of difficulty and speed, user profiles, collection, analysis and data history) is managed through a dashboard a therapist will use to assist during the use

of BODYSOUND. The child will see all the back-end data related to the various sessions filtered through a visual and/or sound feedback that highlights the session's good performance, which motivates him/her to continue in the following sessions. Instead, from the dashboard, it is possible to see the frequency of the activities for every single profile, the correctness of the movements, and observe the trend in the medium/long term.

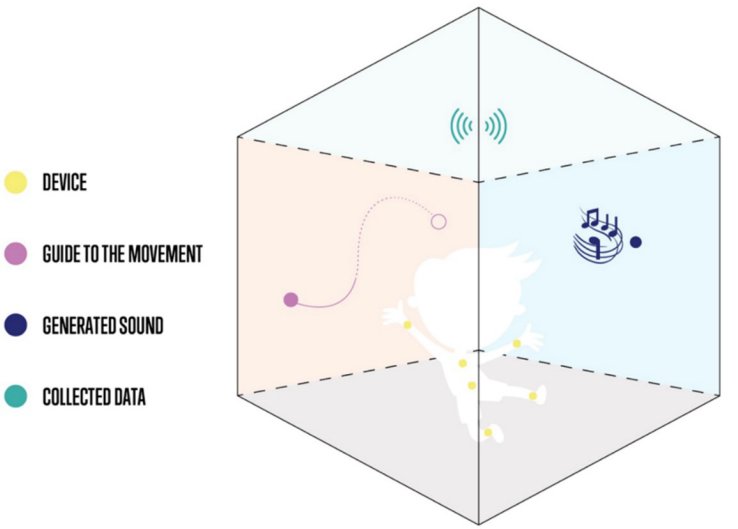


Figure 10 - BODYSOUND elements' visualization. BODYSOUND pilot project, Polifactory, SISCODE

4.4. Co-designing for and with children with cerebral palsy: third round

As mentioned before, we are not going to address here all the research activities carried, but we are focusing on the participatory (co-design) activities, making a specific reference to the involvement of parents and children.

In the following image, the applied-research process is shown, and as it can be seen, both policymakers and therapists were involved during separate sessions of consultation and testing of the first release of the prototype. Actually, the final result (the BODYSOUND solution) for this chapter's purpose is not crucial; however, the process we went through for the development of the solution is very relevant here. As reported below,

we carried out several interviews with policymakers and co-testing and consultation activities with therapists who specifically work with children affected by CP.

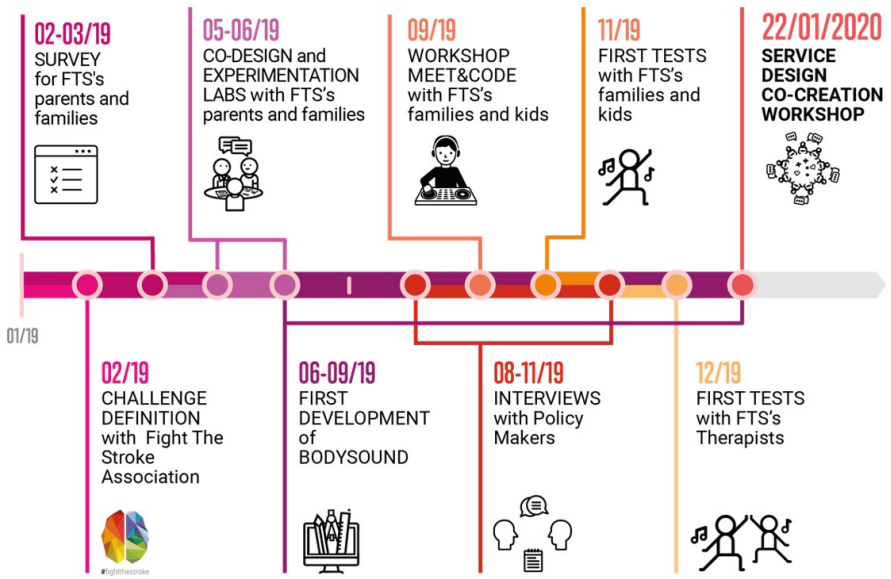


Figure 11 - BODYSOUND journey. BODYSOUND pilot project, Polifactory, SISCODE

After developing the BODYSOUND system software's basic functions, the first testing sessions with children and their families started. This activity aimed to test the level of children's enjoyment of the overall experience, the effectiveness of the graphical interface and the avatar recognizability, the effectiveness of the sound-player association, the preferable number of players. We carried out the tests at Polifactory for several reasons. First of all, because all the technology was there, and it was convenient for us; secondly because parents and kids already knew the space and they developed a sort of familiarity with it.

At first, children approach the game freely without any preliminary explanations and or specific movement exercises to observe the instrument's reactions, and the free play interactions could be. We designed two different experiences:

- the first one allowed to "play" a song, known by children, associating to each person entering the playing field a series of tracks and voices;

- the second one associated a series of musical instruments to each player to create a melody composed *ad hoc* for the BODYSOUND system.

From the first tests, through observations and direct and easy questions to the participant children, we decided to move from a two-dimensional avatar display to a three-dimensional one to facilitate spatial perception even in very young children. We also verified that the melodies made ad hoc could be less dispersive and more effective primarily if associated with individual movements. We noticed that children always involved their parents in the game or even us and this stressed the importance of having the possibility to involve more than one player in the game.

After this first testing phase, we also decided to introduce a greater user involvement by developing a multi-channel feedback system, to guide the child to the correct execution of the movement. In addition to the visual feedback of the avatar and the auditory feedback of sound, we are integrating a set of haptic feedback through a wearable device as an augmentative and more performative experience in terms of motor reactivation.

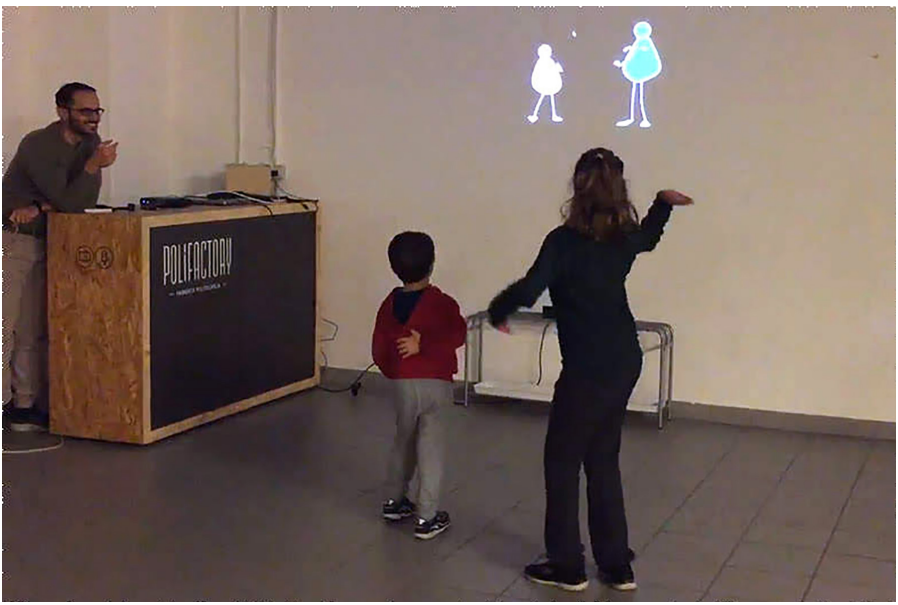


Figure 12 - BODYSOUND tests. BODYSOUND pilot project, Polifactory, SISCODE

The last co-design session that we carried out involved all the typology of stakeholders we met during the BODYSOUND journey. It was oriented to collectively imagine characteristics and features that the BODYSOUND service would have to own. The workshop involved eighteen participants represented by policymakers, therapists, and families from FTS association.

During the morning, after a brief presentation of the project and the system's demo prototype, the group was divided into two smaller groups that had to work on the common construction of a map of opportunities. We invited them to reflect on different possible contexts of implementation, on the purpose of the BODYSOUND experience and to the additional users who could be involved in addition to children affected by CP. We invited each participant to generate some rough ideas starting from the opportunities discussed in the previous collective session. After plenary voting of the ideas, we selected the most popular two, and each table had to work on one of it, trying to hypothesize the provider of the service, specific software functions and goals. The first idea was focused on a school environment, the second on a sports center environment.

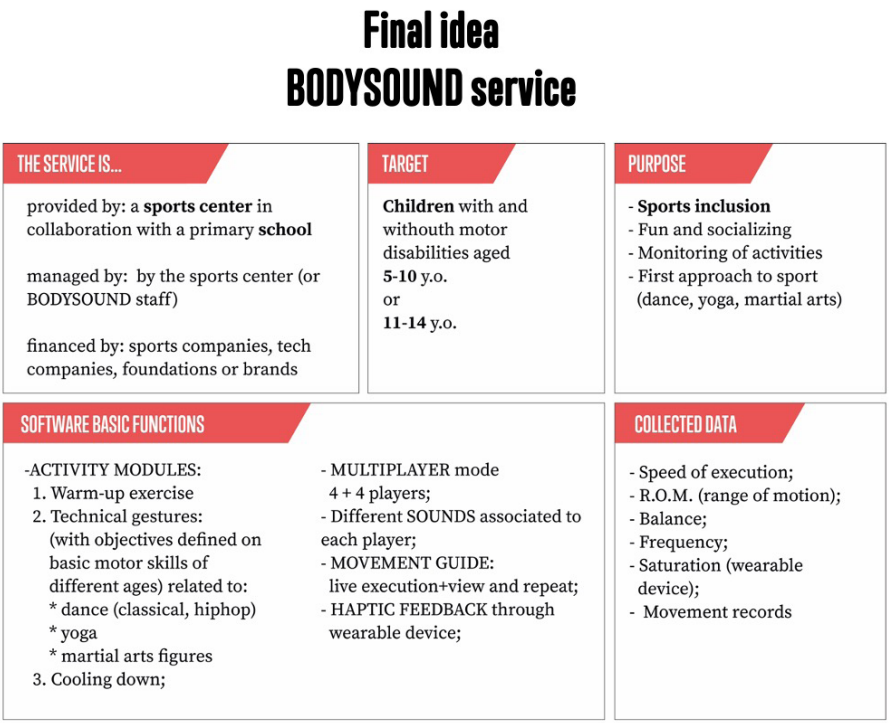


Figure 13 - BODYSOUND product-service. BODYSOUND pilot project, Polifactory, SISCODE

In the afternoon, the participants elaborated on these ideas undergoing through their details. They had to elaborate on three different moments of the service: what would "happen" before, during and after the use. As for the first co-design workshop, the de-brief phase was crucial to identify strengths and weaknesses and be able to merge the most promising features in one unique idea.

We also collected some feedback from the participants on the co-design workshop in general (tools quality and personal perceptions) and on the two ideas which emerged. We sum up here the main pros and cons which emerged:

- the school is inclusive and accessible from different points of view, both because we can reach several and diverse children and because the child affected by CP will not feel "separated" from the rest of the class. The pain points are connected with the availability of adequate spaces, the identification of human and economic resources;
- the sports center presents some positive aspects, such as the preparation of staff and the possibility to experiment with different sports; weaknesses are related to the audience's potentialities and the limited access to it.

The feedbacks on the synthetized idea were very good, scoring a 4.5 for all the elements: access, target, goals, basic functions, data collected.

In general, the co-design experience was evaluated as very good. During the workshop, we had already noticed that all the participants were very comfortable, participated in the whole process and the lunch and coffee moments were very important for people to introduce and also have small talks.

In the following section, we are going to draw some first conclusions on the co-design process put in place for BODYSOUND pilot project.

4.5. Preliminary conclusions

Nowadays, we observe an increasing need and willingness for patients, patient associations and caregivers to be involved in cure and recovery processes for economic, time, social, and psychological reasons. However, patients' significant role should not correspond to the medical staff's absence from the whole process. Patients' involvement in the cure and in processes to envision new solutions might be the right answer to avoid the so-called do-it-yourself care and medicine. Enabling innovation communi-

ties and spaces such as Makerspaces and Fab labs can favor technological and social innovation in healthcare. Design can act as a mediator between different stakeholders, and as a facilitator of innovative processes; makerspaces can act as platforms for co-creation. Makerspaces and Fab Labs can act as enablers of patient innovation processes, avoiding dropout cases from innovation processes.

Indeed, Polifactory space played a crucial role in the organization, and we might say the success of the co-design process. First of all, the possibility of welcoming people in a space that looks like a house-work, where professors, researchers, and students do their jobs but also eat (there is a kitchen available) and chill-out (there is a living room area) is already something of great value. Outside people can see technologically advanced machines, posters of all our events, food served for everybody, prototypes of our past works, and this – in a way – creates a sense of trust, because knowledge is made transparent. It makes researchers' work more understandable, showing them as common people who also share moments of their personal lives.

In addition to that, internal skills and previous experiences in the healthcare sector were crucial.

These days the word empathy is often abused also in the design field. However, an empathic approach to these topics is needed, both for the positive atmosphere it is necessary to provide to participants and the project's continuation. Indeed, co-designing in social innovation, more than in other typologies of innovations, requires time, especially when the area of interest is so delicate as in the BODYSOUND case. Indeed, the moment of empathy is characterized by a whole comprehension of the experience from the parts involved (Stein, 1989). Connecting-of, acting-into, and merging-with is the empathy scheme proposed by Finlay (2005: 289) describing participant researchers' role.

As one of the participants shared with us, welcome, respect, distance, and sobriety made her feel comfortable in this new experience. It is important to take into consideration the feelings of researchers, as well. We had to be prepared to listen to some very touching stories, always maintaining a position between distance and closeness, almost having the role of "stranger" identified by the sociologist Simmel (1950).

In addition to that, the creation of small groups of work was relevant, at least initially. This aspect differs according to the issues (and the users) involved in co-creation practices. However, the group can be larger and more heterogeneous in the following phases of the process. Last but not least, boundary objects' role is of great value to start conversations, to facilitate them, and to empower different stakeholders. Indeed, tools and

prototypes are boundary objects because they can enhance the collaboration between communities of practice (Wenger, 1998) through co-creation, co-design and even co-prototyping processes.

As discussed in this chapter, sharing and co-presence were crucial elements; however, the BODYSOUND journey was influenced by the COVID-19 emergency. Therefore, to continue our prototyping and especially the following testing phases, we had to review our journey according to the impossibility of being in the same place at the same time. We were able to continue our prototyping activities remotely, but in order to maintain the involvement of our users, we had to change the supporting technologies. Indeed, we decided to substitute the Kinect with an ordinary webcam to share BODYSOUND with the children who are going to test it from their homes. Before starting this new testing phase, we invited therapists who participated in the journey to register the training gestures on this platform. At the moment, we are reviewing these gestures in order to create a game experience that, in the following months, will be tested by children. This moment of crisis forced us to find a solution that actually is already scaling the possibilities of diffusing with more children and families the test of BODYSOUND pleasantness, interface, accessibility and usability, and of its specific elements such as sounds and characters, with the broader community of users. We are not going to abandon the original idea. However, we are going to consider both: one that will work in private houses and the other which – we hope in the future – is going to be available in a public (or semi-public) space.

5. Co-designing with vulnerable social groups: LONGEVICITY project

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LONGEVICITY – Social Inclusion for the elderly through walkability[1] is a multidisciplinary research project funded by Fondazione Cariplo[2] within the Call Scientific Research 2017 "*Aging and social research: people, places and relations*". The research consortium is led by the Department of Computer Science, Systems and Communication (University of Milano-Bicocca) and composed by the Design Department (Politecnico di Milano), AUSER Lombardia (regional volunteer association for the elderly) and the Research Center for Advanced Science and Technology (University of Tokyo). In the following pages, we will present the social facts and the consequence challenge at the base of our research activities. We will focus on social inclusion goals, which we, as the Design Department, addressed through cross-fertilization between ethnographic methods and participatory design tools and activities.

5.1. The social challenge

As previously mentioned, cities are complex social systems that often struggle to satisfy most marginalized populations' needs, creating a problematic loop of inequalities. The elderly population, in particular, suffer more than others of risks of marginalization often because of the structure and the design of cities.

Population aging is a global phenomenon, and Italy ranks at the top of the European classification of "older" countries. Demographic projec-

1. https://sites.google.com/unimib.it/LONGEVICITY/home.
2. www.fondazionecariplo.it/en/index.html.

tions show that in 2025 the number of over 65s will constitute over 23% of the world population, given that it will grow further (OECD, 2015). Urban suburbs are most affected by this phenomenon; in fact, the aging index increases directly to the increase in the distance from the city center. The two main orders of problems are inherent in health and social inclusion and are closely related to each other. Cities must, therefore, respond to the challenges not only from an infrastructural point of view (Baltes & Smith, 2003). The most vulnerable cities risk the so-called neighborhood effect, which mainly affects the weaker social groups, such as the elderly. Social exclusion occurs independently of the urban redevelopment processes (Mugnano, 2018), and sometimes these processes even increase this exclusion. The presence on the territory of cultural and recreational-recreational services and activities, for example, can avoid the risk of isolation. Therefore, libraries, public spaces, gyms, cultural initiatives in general can – if accessible and accessible – have a positive impact (Buffel, Phillipson & Scharf, 2012; Boudry *et al.*, 2005). Agenda 2030 and the Sustainable Development Goals, the World Humanitarian Summit and the New Urban Agenda (Habitat III) are highlighting the call for inclusive urbanization and among the priorities identified, they include the engagement of older people in planning activities and decision-making processes (Jones, 2016).

In line with the definition that the World Health Organization gives of healthy aging as a "*process to maintain and develop functional ability, which allows well-being even in old age*", we intended to develop a design research process that took into account hard and soft characteristics of the Metropolitan Area of Milan, experimenting and validating research methodologies aimed at improving the Walkability of specific urban areas. Attention to elderly citizens' ability to walk in the city has grown considerably, from the point of view of urban planning. In 1988, the European Charter of Pedestrian Rights was drawn up to highlight the need to ensure pedestrians' comfort and safety in cities, bringing particular attention to the elderly and people with reduced mobility.

In the city of Milan, the Walkability index (consisting of the attractiveness values for over 75, resident density, road connectivity, road classification, slope) records the highest values at the historic center and the centers of the individual neighborhoods, which are evidently the areas of the city where gentle mobility is most favored. Attention to Walkability would promote not only greater social inclusion and the maintenance of a healthy and active lifestyle, but also the local economy thanks to an increase in the quality of life of the neighborhoods and support for trade retail consumption-oriented. In many cases, Walkability is defined

as a measure and evaluation. Several indexes were built to measure the Walkability of an urban area. In particular, we refer to Speck (2013) according to whom a walk has to satisfy four main conditions: it must be useful, safe, comfortable, and interesting. Similarly, Forsyth and Southworth (2008) define "walkable" as close, safe, barrier-free, full of pedestrian infrastructure and destinations, and also encouraging physical activity, upscale, leafy, or cosmopolitan.

Gorrini & Bandini (2017), leading LONGEVICITY research project, identified five indicators to be tested:

- usefulness: urban areas should be designed to guarantee the presence of numerous and diverse public services for the elderly within a walkable distance from their place of residence (e.g., land-use mix; street connectivity; transport services; social and health care service; commercial activities);
- comfort: urban areas should be designed to accommodate the comfort of the elderly while walking (e.g., pavement type; continuity on sidewalks; installing ramps for people with reduced mobility; urban furniture for resting; green areas with trees, benches, tables and fountains);
- safety: urban areas should be designed to guarantee the safety of elderly pedestrians while walking and crossing (e.g., absence of barriers and the pothole on sidewalks; speed bumpers; traffic lights; illumination systems in the proximity of the zebra crossing; legible horizontal and vertical signage);
- attractiveness: urban areas should be designed to have a polycentric structure, with several and distinctive areas of attraction for the elderly inhabitants (e.g., points of interest, amenities, public spaces and events; quality of the architectural streetscape; the vitality of the social context);
- legibility: urban areas should be designed to be legible, memorable and navigable, in order to enable the elderly to locate themselves easily and navigate through the city (e.g., roads toponymy; legible road signs; place-based maps for indicating public services)

As Alfonzo (2005) stressed, a hierarchy of walking needs exists and it goes from the most basic and personal conditions to higher-ordered and environmental ones: "*Thus, for example, if the need for safety is not met, a person would not consider his or her need for comfort or pleasurabilty when deciding whether to walk*" (ivi: 11). In addition to that, the scholar states that this hierarchy has to be placed in a socio-ecological framework, where personal life circumstances also play a role.

For the discussion presented in this chapter, we selected mainly two ageing of the population challenges out of those identified by OECD:

- infrastructure and urban form need to be redesigned to increase the attractiveness of and well-being in cities;
- social isolation resulting from a reduced social network.

Looking specifically at the last point, existing guidelines for the design of age-friendly cities do not often take into account the needs of sociality among the elderly, which is instead the true intrinsic motivation for them to navigate the city. The investigation of innovative design solutions for the outdoor urban areas will foster the walkability and accessibility of the environments, which will more significantly induce spontaneous aggregation and appropriation of public spaces by elderly citizens. These aspects have been promoted by conducting a human-centered approach for creating a new meaning of age-friendly cities. The results of the project will provide knowledge, data and experiences useful for city managers and policymakers involved in the design of innovative and technological solutions (ICT, IoT) for the management of mobility in future smart and sustainable cities, characterized by the presence of active long-living inhabitants interacting with multiple technology-based services.

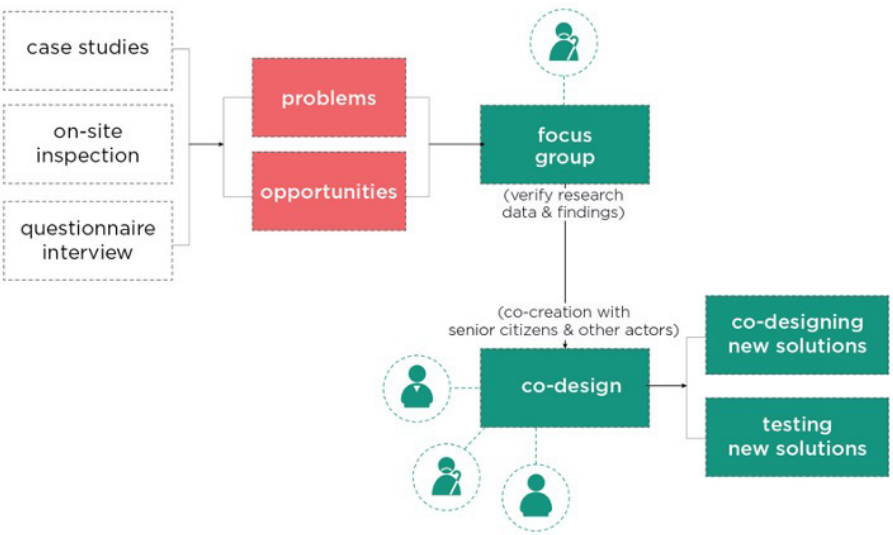

Figure 1 - The design-led research process. Elaborated by authors. LONGEVICITY project, Design Dept., Politecnico di Milano

On the basis of the literature analyzed and observations carried out in two main areas (Sesto San Giovanni city center and Gorla-Crescenzago neighborhood – in Milan), a design-led research process has been formulated, acting as a platform on which different stakeholders were able to discuss on the issue of walkability and to co-create possible ideas for improving the existing situations towards their preferred ones.

Before directly engaging the senior groups in the selected neighbors, we launched a questionnaire to the whole senior citizen community in Milan. The aim was to understand better the general state of the art of the elderly's lives and what are the principle difficulties and needs regarding an age-friendly city.

The questionnaire included four main issues: basic information and living condition; activities in spare time; information of the neighborhood and mobility activities in the neighborhood. The questionnaire was distributed both online and offline, available in different offices and AUSER centers. Eventually, more than 100 replies were collected. The result provided a basic overview, showing the essential needs of senior citizens on the city and neighborhood, as well as their main difficulties and concerns about walking in the city.

5.2. Co-designing for and with senior citizens: first round

In this chapter, we are going to specifically look at the process carried out in the Sesto San Giovanni city center area; however, the same process was followed for the other area of interest.

Before starting with our users' engagement, we carried out several meetings at the AUSER centers to explain the research and its objectives.

We created a WhatsApp group to maintain communication with the volunteers participating in the project (about twenty people).

The interviewing activity was the first relevant, inclusive action. We organized two days of interviews during which we were carried out at the AUSER centers. It was essential to identify the center as the place for the research because the participants were already familiar with it and it was easy to reach it for everybody.

Interviews focused on hard and soft factors defining the walkability of the area of interest to get some knowledge on their quality of life perception (Hirsch *et al.*, 2000), relationships and networks (Lui *et al.*, 2009; Scharlach, 2012). We conducted 11 interviews. The interviewees

were asked about personal information, leisure time, and to evaluate the neighborhoods taken into consideration in the project, according to the same indicators used to carry out the observations. Indeed, we wanted to compare the results of the parameters mentioned above of walkability. The interviews were conducted both singularly and in pairs in order to make the participants comfortable. Apart from the normal process of question and answer, we asked our interviewees to interact with a printed map of the selected area. They could indicate their walking paths with different colors, also highlighting positive and negative elements they usually encounter. Maps constituted our boundary object and became tools for conversation. Senior citizens are more used than the young generation to handle maps, and for these reasons, they did not encounter any problems using them. They easily navigate through it, showing us their most common walking paths and specific points of dangers, such as risky crossing, sloppy or broken pavements, but also places that they usually go for sports or recreational activities.

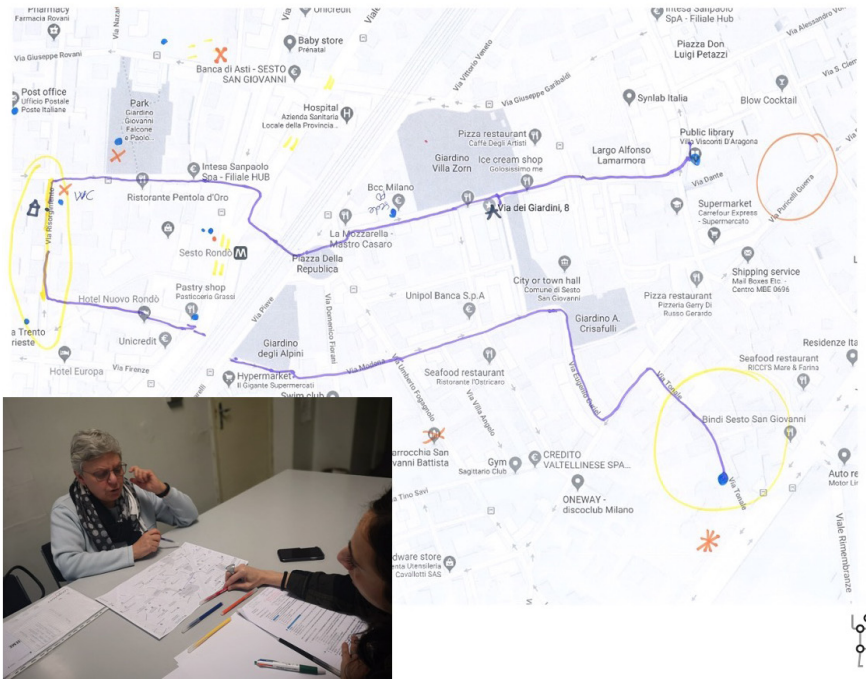

Figure 2 - Interview scene and the map (used as a tool to involve the interviewees). Elaborated by authors.
LONGEVICITY project, Design Dept., Politecnico di Milano

Several common issues emerged. We briefly sum up them according to the different indicators of walkability:

- usefulness: in general, the opinions were positive because of the presence of different services, such as shops, libraries, parks, post office, public transportation services, etc.;
- comfort: it was poorly evaluated, especially in specific points of the area of interest. The most common problems were connected with paving and the lack of handrails (were stairs to enter the subway), benches, public toilets, and drinking fountains;
- safety: in general, the perception of personal security was right; they declared to go out also in the evening and dark hours. However, they declared to be stressed by the presence of bicycles on the sidewalks (which do not make noise so they cannot hear them coming), the poor lighting in urban parks, and tree roots on sidewalks;
- attractiveness: they were generally satisfied by the presence of public squares, parks, leisure centers, the library; however, they firmly contested the present government of the cities, which is dismantling various cultural associations;
- legibility: was not a problem at all since they know the neighborhood very well;
- population: they were satisfied with the *social mixité* of the area.

We can conclude that, they typically walk in their neighborhoods, they have great knowledge and attendance of the area of interest and their general satisfaction is pretty high.

According to these first results, we could identify several design opportunities useful for driving the second part of the research, which would have been based on more collective engagement and co-design activities.

5.3. Co-designing for and with senior citizens: second round

The second part started with conducting a focus group in the form of a workshop with a group of seniors who had already participated in the interview activity and some new participants; in total, fourteen seniors participated in the focus group. The focus group phase aimed to generate qualitative perceptions of "walkability", which had been analyzed compared to the indicators previously identified in the observation phase.

Besides, the focus group activity opened the conversation among all participants to discuss on discovered in the interview phase. Six parameters and previous findings were used to design the research tools for the focus group activity.

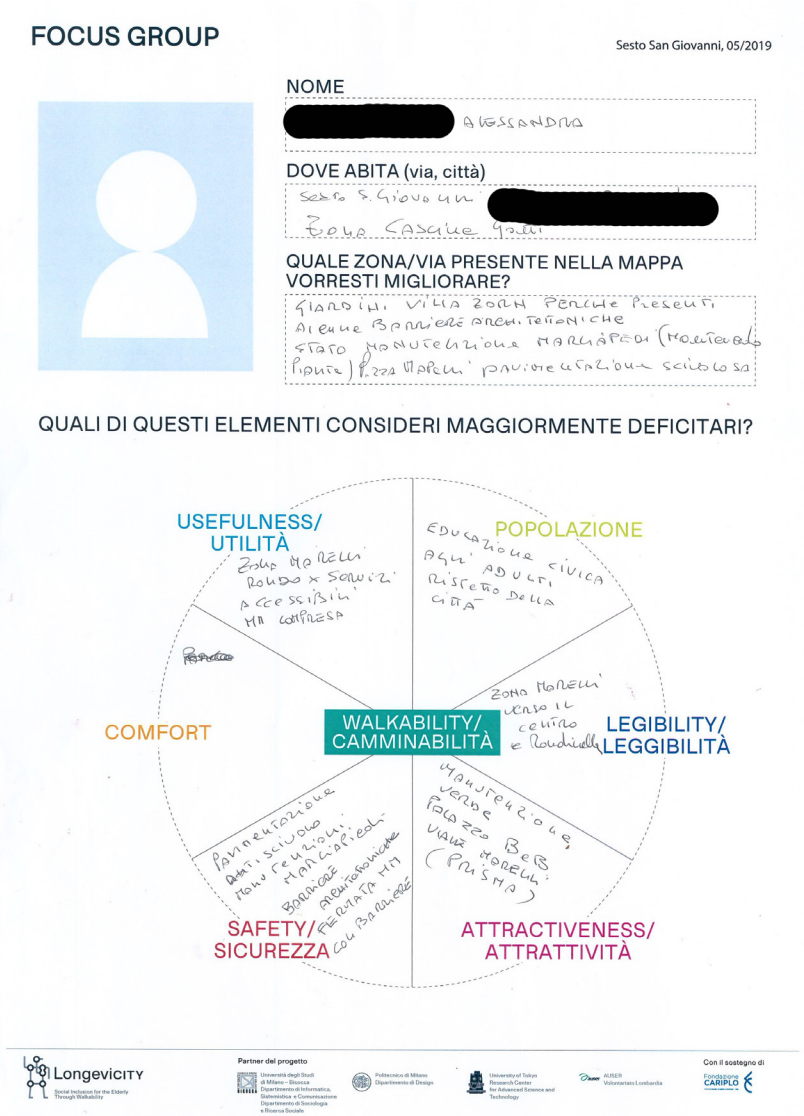

Figure 3 - Tool used during the focus group with senior citizens. Elaborated by authors. LONGEVICITY project, Design Dept., Politecnico di Milano

Before starting, the participants were trained and informed on Walkability's concept and on the previous activities carried out, with particular attention to case studies selection and little information on the interviews (in order to avoid biases). The tool developed and used for this activity is shown in figure 3.

The first task was carried out individually, and the seniors had to point out problems that they observe and face in the selected neighborhood according to the different walkability indicators. Then, different opinions were shared and discussed with the support of a big map of the interested neighborhood; we were able to collectively identify three problematic areas (from left to right): the "Rondò" area, the "Underpass" area and the "Centre" area.

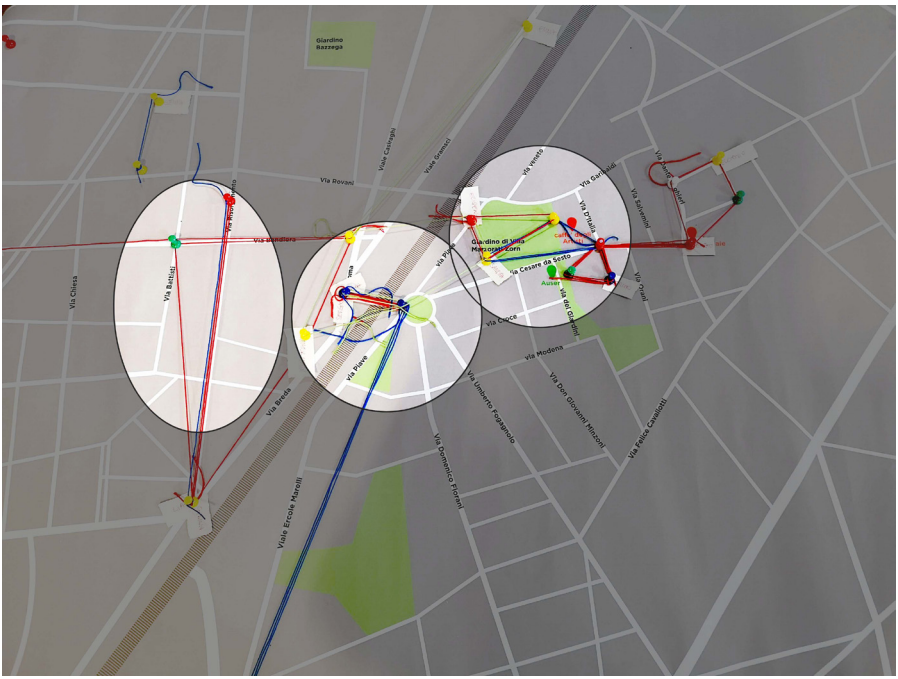

Figure 4 - Three identified problematic areas in the neighbourhood. LONGEVICITY project, Design Dept., Politecnico di Milano

Afterward, the participants were then divided into three groups to work on a specific area. Each group had to work on one assigned area and to identify for each walkability indicator hard or soft elements that – in their opinion – were missing or needed.

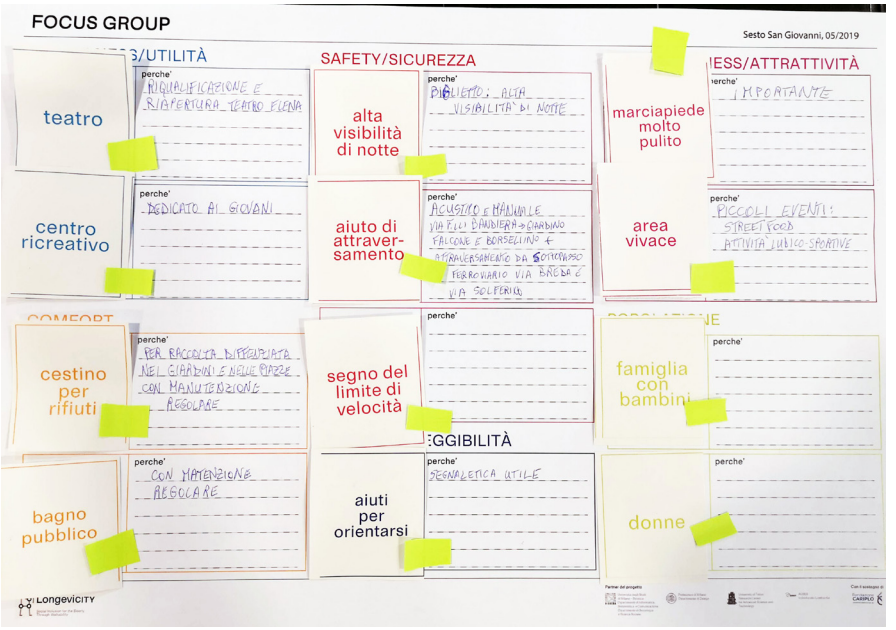

Figure 5 - Selected elements to increase walkability in the neighbourhood. LONGEVICITY project, Design Dept., Politecnico di Milano

It was interesting to notice how all the three groups were very much willing to have a recreational center, which was selected as the most important usefulness element, with specific attention to the renovation of an abandoned and historical theatre of the city. The comfort was focused on the availability of public restrooms, the improvement of trash bins, the implementation of elevators or escalators (for the underpass), and good general maintenance of sidewalks. As safety is concerned, lighting was the most quoted element that confirms the importance of personal safety perception. Attractiveness indicator mainly addressed issues about the offer of initiatives and also the capability to find information about these; in addition to that, the seniors in the "underpass" group mentioned a specific place, Mapelli square, that would require some renovation in order to become attractive and to become a gathering place. For the legibility indicator, the senior participants mainly suggest some additional orientation helps; and for the population indicator, in general, they stressed the importance of having a variety of people with particular attention to women and children.

We sum up the focus group results during a follow-up phase conducted among the research team and we identified two main issues to be addressed:

- make (mainly – but not only) public and open spaces available for the involvement of different generations and typologies of people to perform different activities, especially creative and social ones;
- pay attention to safety both "real" and "perceived" (e.g., signs for crossing, wideness of sidewalk, lightning, etc.).

The resolution of both issues was able to increase the elderly's willingness to take a walk in the neighborhood. We organized an urban walking tour, together with the senior participants who conducted us through peculiar and relevant places located on this path. The idea was to investigate the previously mentioned two issues in the real context and have direct experiences of the mentioned places. This activity was important both to gain additional information and to maintain the connection of the group.

Figure 6 - Urban walking tour with senior citizens.
LONGEVICITY project, Design Dept., Politecnico di Milano

5.4. Co-designing for and with senior citizens: third round

This last phase was focused on the co-creation of concepts and possible solutions that will answer the issues emerging from the research's previous phases. We organized a co-design workshop inviting both seniors who participated in the previous activities, students both from the Design Department and the Department of Computer Science, Systems and

Communication. All participants were mixed and divided into three groups (three or four senior citizens, two students from the Design Department and two students from the Department of Computer Science, Systems and Communication).

The workshop was organized with four main steps:

- brainstorming;
- concept generation and formulation;
- scenario building and visualization;
- building personas & stories.

The workshop started with the general question "How might we improve senior citizens' social lives in the Sesto San Giovanni area through walkability?".

We created *ad hoc* tools and provided some inspiring questions, case studies and images to guide the co-design activity. Before each step, we explained to the participants, especially our senior citizens, about each design method and tool to give them enough knowledge to feel comfortable providing their contributions and experience. For example, in order to facilitate the brainstorming activity, we provide the following inspiring and disruptive questions: What passions do you have? What activities do you like to participate in during spare time? What would you like to do while taking a walk? If you had to think of a person or a type of person you

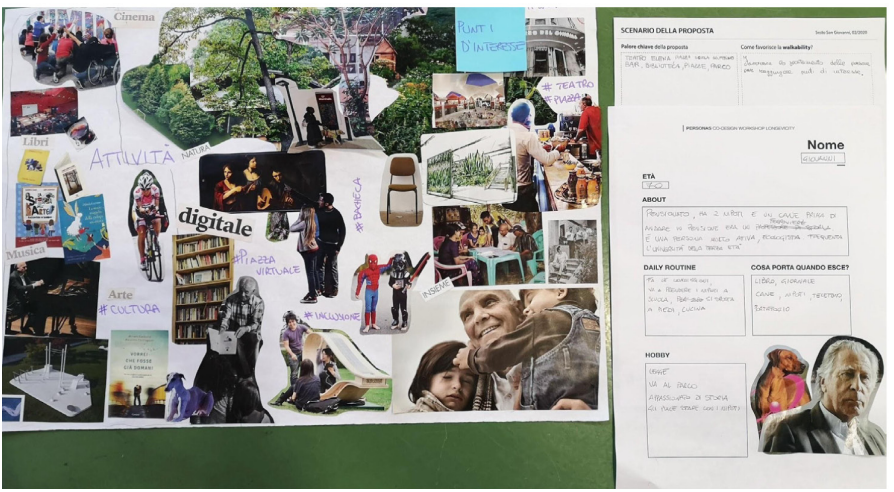

Figure 7 - One example of visualized scenario and persona. LONGEVICITY project, Design Dept., Politecnico di Milano

don't know directly but would like to take a walk with, who would it be? Have you ever had a particularly interesting walk on vacation? What was interesting about it?

In addition to that, the co-creation of boundary objects such as mood-boards/collages was essential and engaging for them, especially in the building scenario and personas creation activities.

We mainly oriented the co-design workshop to the participants' engagement rather than on the generated outputs (Meroni, Selloni & Rossi, 2018). For this reason, the role of designers was crucial in translating the information and basic ideas emerged and collected during the workshop in concepts that would potentially go through an additional assessment and development phases.

Three concepts were reframed and developed and had common characteristics. They are described in Box 3.

As said before, starting from the requirements of paying attention to *safety* and *security*, especially addressing the improvement of safety perception and the possibility of customizing walking paths according to the user's specific characteristics.

The other walkability indicator identified as a very important factor was *attractiveness* and the possibility of getting information on local social and cultural events. All the concepts comprised elements that looked at increasing seniors' possibilities of having a satisfying social life.

In addition to that, all the concepts were thought to improve users' physical well-being, stimulating them to go out and reach their destination on foot and, in the last concept, performing real training exercises. Inclusivity is another crucial characteristic owned by each concept; indeed, they were thought for the specific target of seniors, however, they could be attractive and used by everybody. This characteristic explicitly answered our senior participants' request for not being "ghettoized".

It is important to stress that all the concepts were future-oriented. This is not because they are particularly "futuristic" but because they especially looked at seniors of the next future who would undoubtedly own greater expertise and more confidence with and used to technology and digital devices. Notwithstanding that, we must stress that our senior participants were already pretty confident with technology, especially with smartphones; but we cannot underestimate the digital divide risks.

Box 3 – LONGEVICITY Concepts

Itinere (students: Stefano Canavero, Claudia Pelosi): a system of virtual squares/plazas, an information tool and a gateway to the social dimension of the neighborhood. The physical contact points are totems located in strategic points that present the display of activities and events in the area, recommending itineraries and connecting people interested in the same activities. The aim is to entice the elderly and anyone who has difficulty participating in the social life to go out, be informed on what is happening in the surroundings and to cultivate social relationships.

Figure 8 - Itinere project.
LONGEVICITY project, Design Dept., Politecnico di Milano

EsploraMi (students: Caterina Castiglioni, Livio Placenti): a geographic internet service with a simplified interface that suggests paths and new places to visit according to their walkability parameters and matching the interests of users. The indications on the route will be through vocal synthesis transmitted by a separate (wearable) device.

Figure 9 - EsploraMi project.
LONGEVICITY project, Design Dept., Politecnico di Milano

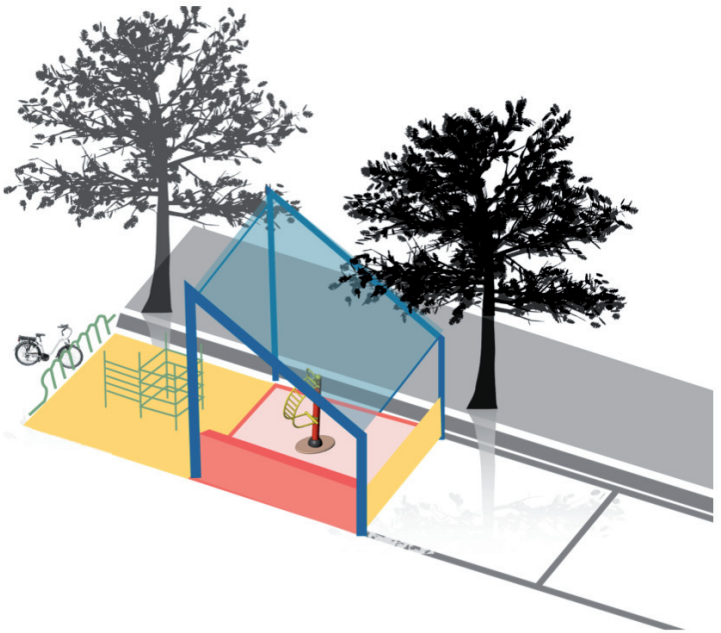

Figure 10 - Active Seniors - wellness maps project.
LONGEVICITY project, Design Dept., Politecnico di Milano

Active Seniors – wellness maps: the service consists in the installation of a series of external gym equipment in various points of the city which together create a map of points of interest. Outdoor gym equipment is installed so as to generate interest in users to move from one point to another to complete the workout. These equipment uses kinetic and solar energy to produce light energy at night, increasing the brightness along the routes and also improving the perception of safety.

5.5. Preliminary conclusions

LONGEVICITY research project was organized according to the four methodological intents, who Jones identified as to be included in the adoption of systems practice in design research:

- Explanation by social research;
- Understand or Prediction by process evaluation and system design;
- Change by stakeholder engagement;
- Design by design research method.

The system thinking leads us to emphasize the research on exploring the *software* of a city (specifically, a neighborhood in the city) and the relationship between a city's hardware and software.

Therefore, it comes to the thinking that there are two dimensions of evaluation and to improve the city's walkability level. The hardware can be addressed through strategic urban planning to increase the comfort level, and basic infrastructure maintenance and upgrades to guarantee walking safety. Even more importantly, the software can be improved, creating new events and opportunities to increase the neighborhood's vitality, which could be mainly applied to improve safety (the elderly's perception) and attractiveness. Working on the soft aspect of walkability requires a careful consideration and organization of several parameters.

Looking specifically at the change by stakeholder engagement, the main change we wanted and attained was focusing on the stakeholders themselves. This means that we engaged senior citizens not only in order to get knowledge but also to empower them, in line with what stressed in the Capabilities Approach proposed by Nussbaum & Sen (1993). Indeed, they were informed throughout the whole research process, also receiving

crucial information on our project and on the topics that they were asked to reflect on. In addition to that, they gained knowledge on collaboration tools that they might never use in the future but that – at least – gave them a leading role in the process.

Another important element is concerning the places where we conducted all the research activities. We decided to go directly on the field and use the spaces where AUSER (the seniors' association) was located. This was very important because seniors were more comfortable with because they already attended these spaces and – in a way – they hosted us (instead of the other way around). Many novelty elements were already asked to be managed and acquired, so having a "safe" space of confrontation was definitely a success factor in involving the participants.

Conclusions

The journey that we made through this book wanted to examine the concept of innovation with particular attention to the social changes that have influenced the activation of processes aimed at the benefit of communities. We can agree to call these processes with the collective name of social innovation. More and more contemporary challenges require designers to adopt a whole sustainable approach, comprising environmental, economic, and social aspects. In particular, social innovation can and should be constituted by all these domains of sustainability. Due to its combined nature, it can be satisfied and achieved through the involvement of users and stakeholders in co-creation processes that could also favor fragile populations' empowerment.

Two research studies, which were generally focused on improving the quality of life of specific users-stakeholders involved, were presented. The first here discussed, SISCODE European project, paid attention to the pilot project BODYSOUND, which involved children with cerebral palsy and their caregivers (parents). The second, LONGEVICITY dealt with active aging issues, focusing on the walkability of urban areas. Both research pieces were profoundly based on co-creation methods, which, as discussed, followed recursive processes. Even if not explicitly, both of them followed a model which was similar to that proposed in the Grounded Theory (GT) methodological approach. GT can be applied to the research process and to the output of this process, when the objective is to build or confirm a theory. From the present dissertation, it is possible to refer mainly to the research strategies and theories.

Similarly to what happens in the Systemic Design approach, GT is an integrated methodology. The actions and concepts carried out and used are strictly interrelated with other actions and methodologies from other research fields. This interdisciplinary and multidisciplinary practice is

very common in design research studies. The origin of GT relies on sociology. Glaser and Strauss theorized this qualitative approach to research in their book "The Discovery of Grounded Theory" (1967) to propose and assess a new method of analysis different from the most traditional quantitative ones. Carrying out an iterative process of data collection and analysis, according to Glaser and Strauss, "*researchers would sequentially focus on the most significant issues in the field of study. Simultaneous data collection and analysis help researchers to steadily focus on developing concepts about the data and to gather further data*" (Charmaz & Thornberg, 2020: 2).

Taking a step back, how GT operates? It is based on the use of multiple sources of data, including a wide range of qualitative and quantitative methodologies, such as surveys, interviews, observations, case studies, secondary data, etc. In addition to that, also "informal" or non-academic knowledge is welcome, that is, information (and inspiration) retrieved from documentaries, newspapers, photos, for example (Corbin & Strauss, 1990). This variety does not mean that the data collection is random; in fact, researchers have to plan and organize this phase, even if – as in GT happen – it will continue along the whole research process. Through the analysis of data, new concepts and categories, to be verified and added to the following research steps, emerge (Khambete & Athavankar, 2010). For this reason, it is possible to state that the GT model is characterized by a constant comparison (Guetterman *et al.*, 2017).

GT approach is similar to the trial and error scientific method, which design lately has adopted, for example, through and in rapid prototyping. I am not going to address here the evolution and the specificities of the trial and error approach; however, together with GT, it represents how the two research projects described in this book have been conducted. I might affirm that many design pieces of research use these approaches, even if researchers do not clearly explain the methodological choice. This is particularly true when GT is taken into consideration, also because its knowledge is missing among design researchers, while trial and error is well-known and has become the norm.

System thinking and design thinking approaches have shown their advantages when dealing with wicked and complex problems. The system is a whole entity that cannot be divided into independent parts. Each element's behavior always affects the whole system and on the interdependent elements (Ackoff, 1997). For this reason, as mentioned above, Systemic Design approach is similar to GT. It is inductive and, in order to address the density and variety of societal problems, it starts with the collection of data and information from contexts and diverse actors,

exploring then patterns and potential answers and solutions. This is the main difference between humanistic research (e.g. sociology) and design research, which – for its own nature – has to provide solutions to the addressed issues. Another important difference relies on the knowledge that the population involved in the research actually acquire. As we have previously discussed, co-creation activities more than other research activities provide real knowledge on research tools, goals and outputs, and the perception of the impact of the research itself is greater among the actors involved in design research experiences.

For the present discussion, it is relevant to highlight that Glaser and Strauss developed GT to explain the research process used in qualitative studies on hospitals and death in these infrastructures. Indeed, GT is particularly appropriate to learn about the subjects of your study; in addition to that, more and more GT "*means making what the researchers learn transparent by showing how the research has been conducted thoroughly and systematically*" (Charmaz & Thornberg, 2020: 2). For this reason, GT, which has already been adopted by other disciplines than sociology, such as psychology and philosophy, can be particularly relevant in design fields, especially when it deals with social innovation and co-creation methods.

This process was applied in both the research presented in this book.

Indeed, in BODYSOUND pilot project, as previously mentioned, used primary and secondary data, quantitative and qualitative data, with a wide selection of techniques that implied co-creation moments with a wide range of stakeholders and tools. In particular, the prototyping phase was organized according to quick and raw solutions to be continuously tested, assessed, and modified. BODYSOUND pilot project, within SISCODE research project, was solution-oriented and for this reason, the recursive model was mainly applied to the prototyping phase.

LONGEVICITY research project was more based on the construction of a theory on walkability in connection with active aging and specifically with social inclusion. Therefore, the recursive model was more focused on acquiring knowledge on these issues directly and indirectly with special attention to senior citizens' involvement and empowerment. Our population of interest (target) was involved along the whole research process through various techniques, such as interviews, focus groups, and also in this case, co-creation activities based on different design tools. Final solutions were not the main goal of our research; indeed, we only arrived at the declaration of raw concepts.

Therefore, looking in particular at social innovation involving vulnerable social groups, we can refer to what Lenskjold *et al.* (2015) called

minor design activism, which seeks through open-ended and co-design experiments "*to challenge prescriptive agendas and to reconfigure group relations*" (ivi: 67). This is defined as a tactical principle in co-design with marginal (and/or marginalized) participants, which here I propose to define as vulnerable. Vulnerability is indeed a prior condition to marginalization. This means that specific characteristics, which can be more or less diffused, can have as a result the marginalization of certain people from society. Demographic or health conditions (e.g. old age, being affected by diseases) are not in itself reasons for marginalization; however, according to the organization of a society or even to the urban planning put in place, these conditions can become real weaknesses. When a vulnerable group is marginalized, it represents for the society what Bauman called "*human waste*" (Bauman, 2004). The scholar developed this concept in order to describe how society defines marginal subjects, considered useless by and for the society, and thus socially excluded and relegated to margins (D'Urzo, Pezzi & Campagnaro, 2017). As stated in OECD report *How's Life?*[1] differences by gender, age and education, have direct impacts on well-being outcomes. However, real differences are mostly connected with levels of resources and social capital owned. To greater resources and social (and also symbolic) capital correspond higher levels of participation in social life, which consequentially improves the level of social capital owned creating a loop of positive self-reactive sequences. Similarly, though, "*disparities in engagement reinforce social inequalities*" (Yates, 2011: 198). For this reason, we should question ourselves as researchers, conducting participatory research activities, who are the people who actually participate.

As has been discussed, the engagement of persons (users) is a very difficult and delicate task, which often ends with the engagement of people that are already engaged within society. Therefore, vulnerability does not mean marginalization *tout court*. Following Yates (2011) in his discussion on critical consumption, people who usually participate in social life and co-creation research processes are usually people with higher education levels and from higher social classes (higher incomes). However, the positive effects of the involvement of vulnerable populations might bring to direct improvements in the quality of life of these (small) groups and the results, when implemented, might bring to the improvement of the quality of life of the most marginalized ones within the same "category" of vulnerability.

1. www.oecd-ilibrary.org/economics/how-s-life/volume-/issue-_9870c393-en;jsessionid=NoQH_ScWfbtkvq5ewZ74vYoh.ip-10-240-5-182.

It is even possible to state that results and solutions developed for a vulnerable and marginalized population increase the whole society's quality of life. Indeed, civic and civil rights are not subtractive, but they are additional; to make this statement clearer, we can refer to the words of president J.F. Kennedy "*It was founded on the principle that all men are created equal and that the rights of every man are diminished when the rights of one man are threatened*"[2]. This means that the satisfaction of the needs of specific vulnerable populations will not deny the satisfaction of other populations' needs. To better clarify, Social innovation does not responds to the rules of a zero-sum game where each member of a society gain or loss is exactly balanced by the losses of others (Sennet & Cobb, 1972). Instead, the improvement of the quality of life of specific populations can positively affect the whole society. Building a more walkable city or developing a solution to perform sports or therapy at home, as discussed in previous chapters, can provide improvements in everybody's lives. Innovation, to be social, has to be open and free. In order to satisfy the first request (open), innovation has to be participated by subjects that usually do not enter in these processes; to address the second (free) innovation has to be available to be used and shared.

In light of these reflections, I want to propose here the concept of well-being scalability, which should be considered in every research project addressing social innovation.

A final remark on participation cannot avoid reflecting on its future in light of the recent COVID emergency. In the two projects discussed, we had to face with the lockdown due to the pandemic. In the case of BODYSOUND we had already carried out the main co-design activities planned and we could go on with the prototyping shifting from a solution that required a common space to be used to a solution that could be available to everybody who owns a high-performance personal computer with a camera[3]; in July 2020 we were also able to test our solution with kids attending a summer camp without particular restrictions. Instead, as LONGEVICITY is concerned, we had to stop our co-creation activities due to the specific population involved. Seniors were indeed the most vulnerable population in this difficult moment. Therefore, the co-creation workshop that we had to carry out with another group of senior citizens was canceled. Emergencies such as those that we had experienced (which has not actually ended yet) could marginalize vulnerable targets. Indeed, the lack of

2. President Kennedy speech, 11th June, 1963. www.pbs.org/wgbh/americanexperience/features/jfk-civilrights/.

3. www.bodysound.org/play/.

physical proximity and interaction, both with peers and other people, can bring to social distance. This term was wrongly used by politicians and media to describe the restrictions we all had to respect to avoid the virus spreading. However, if everybody had to stay physically apart from friends, relatives and colleagues, only the most vulnerable and already marginalized completely void their social relationships. In contrast, the others maintained their sociality online. We need to think and to design the future of participation in light of this experience. We were able to use online platforms to run meetings and workshops but when vulnerable populations are taken into consideration, we need to care about both digital divide and digital inequalities. Digital divide in the OECD definition is the "*gap between individuals, households, businesses, and geographical areas at different socioeconomic levels with regard both to their opportunities to access ICTs and their use of the Internet for a wide variety of activities*"[4]. It has to do with the availability and access to the Internet and to digital devices. Digital inequality instead refers to people who do have access to the Internet and digital technologies but who differ according to their skills and knowledge in their use because of socioeconomic and demographic disparities. In general, we can say that European countries are mainly characterized by the second, even if remote territories are still affected by the first.

For this reason, in general, people who owned digital skills were able and will be able to participate in design research activities if this form of online participation will also be maintained in the future. At the same time, the use of digital platforms could worsen social exclusion or even generate new forms of marginalization. In my opinion, in general, participation and research should keep physical and face-to-face proximity taking care of all the safety procedures needed.

I am going now to propose some final remarks both on participatory research activities and design solutions implemented according to a series of issues connected with accessibility, safety, and sharing.

As it has been said, the digital can be a great research *escamotage* for lockdown periods. However, the sustainability in terms of economic accessibility and skills of use of these tools and solutions have to be considered, especially for specific typologies of vulnerable populations, such as the elderly and people with disabilities. When we talk about research and participatory activities to be conducted online, to be the most inclusive as possible, the use of apps such as WhatsApp can be more accessible for people who own very basic digital skills. However, as mentioned before,

4. https://stats.oecd.org/glossary/detail.asp?ID=4719.

qualitative research, like the one proposed by GT, needs to maintain face-to-face interactions to be effective. Talking about designed solutions, their adaptability on personal devices can be of great help, as we experienced in the BODYSOUND case. At the beginning of the project, the so-called telerehabilitation was not our main purpose. However, during the lock-down and immediately after, we understood that BODYSOUND could have great potentialities in situations where going to perform your sport-therapy session was impossible. Indeed, during the lockdown, rehabilitation therapies, especially for less severe situations, were completely stopped, as also happened with sports. This caused a deterioration of patients' conditions, capabilities, and general well-being[5]. Nowadays, BODYSOUND is not a rehabilitation game, but it is anyway a stimulator for performing controlled movements and gestures, which could potentially be used by everybody.

Talking about sharing, the use of outside spaces should be preferred in conducting participatory activities and also in the imagination of solutions. This could mean working with smaller groups and conducting several rounds of the same activity with different people but also to design public spaces in a more spacious way. In these last months, great attention has been paid to reduce the space for cars in our cities and to give more space for people to comfortably stay outside[6]. For example, in Milan, a plan to devote over 35 kilometers of road space to bikes and pedestrians instead of cars has already been developed[7]. With the project LONGEVICITY, we had already stressed the importance of building more walkable cities, and it seems that with the COVID-19 emergency, this requirement became a duty actually. Not only urban furniture will need to be re-thoughted according to sanitary standards such as using antimicrobial materials but also, when possible, using touchless technology (e.g., pedestrian traffic light on-call, information totems, etc.). As previously stressed, design has great power in sustaining social practices, and what we are facing now is a cultural shift. We need to look at this moment as an opportunity instead of as only a problem: an occasion to renovate our respect of others and common goods, to promote social innovation avoiding social distancing and marginalization, to achieve the goal of *well-being scalability* for all.

5. www.theguardian.com/commentisfree/2020/apr/29/coronavirus-disabled-people-inequality-pandemic.

6. www.nytimes.com/2020/07/09/opinion/sunday/ban-cars-manhattan-cities.html; www.theguardian.com/world/2020/may/18/cleaner-and-greener-covid-19-prompts-worlds-cities-to-free-public-space-of-cars.

7. www.bloomberg.com/news/articles/2020-04-22/a-car-free-blueprint-for-city-life-after-lockdown.

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What are the social facts that led to the need to activate social innovation processes? What is (and what can be) the role of design in these processes?

The challenges of modernity and post-modernity have led designers to become often protagonists and activators of sustainable and social innovation processes, possible thanks to users' and stakeholders' involvement in co-creation processes.

This book adopts a multidisciplinary approach to eviscerate social innovation as a concept with its foundation in theoretical, political, and methodological domains. The discussion is based on sociology and design. The first, sociology, in connection with other disciplines, such as geography and economics, mainly defines the theoretical and methodological framework of reference; the second, design, mostly deals with experimental and applied research, and it does through the presentation of research projects.

The operative definitions of creativity and innovation will be provided in order to historically and culturally frame them as foundations of the social innovation concept, which emerged and consolidated because of specific social facts and changes. A special focus on design and consumption will be provided in light of their approach to sustainability issues, looking at designers and consumers as agents of change. In the conclusions, after the presentation of two research projects, the Grounded Theory's methodological approach will be proposed as preferable in social innovation research processes; the concept of well-being scalability will be introduced; and questions will be asked about the future that social innovation co-creation processes may have in light of the recent health emergency.

In this book, sociology and design theories and methodologies are interrelated and sustain each other; for this reason, the book is particularly suitable for students, researchers, and practitioners from these two fields.

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La passione per le conoscenze