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TERRITORIAL DESIGN AND NETWORKING
Blended strategies to redesign future connections

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ABSTRACT
Today, sustainable innovation is meant to evolve from the linear model to the circular one. Attempts are made to offer – starting from a knowledge and training upgrade – a new innovative society (Society 5.0) where companies are part of complex relational systems leading to the creation of new sustainable and interconnected supply chains (territorial networking). In this context, the design develops new project visions based on relational paradigms and represents the bridge between technological innovation and social contexts, since it is able to shape technology by harmonising it with cultural, social, economic and political elements.

KEYWORDS
strategic design, territorial networking, innovation technologies, circular economy, knowledge

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Today, sustainable innovation is meant to regenerate in a circular way, providing companies which follow this approach based on mechanisms that drive value creation and are consistent with the principles of not only environmental, social and cultural, but also economic sustainability (Sobrero, 2018). According to this new paradigm, the value of production factors (material and energy resources) and finished products is maintained in the economic process for as long as possible in order to minimise waste production. Indeed, the linear model typical of our current economy – make, use and dispose – has reached its limits since the depletion of a portion of natural and energy resources starts to emerge (Sobrero, 2018). Therefore, the transition from this linear model to a circular model (circular economy) becomes necessary: considering all the stages – from design to production and use, until end-of-life destination – it has to be able to take every opportunity to limit material and energy input and minimise rejects and waste by paying attention to the prevention of negative environmental externalities and the creation of new social and territorial value (European Commission, 2015).

The objective of this article is to show how it is possible to imagine – through cases still isolated and yet to be experienced in their potential – an innovation offering a new model of society which efficiently uses production factors, and optimises material, energy and waste stocks, according to the logic of making, using and recycling. This innovation connects environmental and economic aspects in a context of raw material shortage and price fluctuations, contributing to the supply security and to the promotion of resources and natural capital (European Commission, 2010) by designing products with the aim of turning them into resources for another production process and linking the different actors in the current supply chains in order to create new, more integrated, circular, innovative and, hence, sustainable ones.

From an operational point of view, the new production model can be implemented, starting from the planning phase, through the use of good practices which can be integrated into a single strategic project to form a veritable paradigm change, producing dramatic changes especially in the relationship between producers and consumers. Companies, from this perspective, will be part of a complex, more and more interdependent, relational systems where will develop new project visions and innovation no longer linear, but namely circular and coherent, based on this new relational paradigm which will allow the creation of new, innovative, sustainable and interconnected supply chains. This model of circular economy in which, in addition to the development of products and services, many methods of production and use, and alternative ways of social interaction with consumers will be added, makes it possible to find new unmet needs which will be a source of inspiration for innovation (Fig. 1).

On the basis of these reflections, there are many best practices that, especially in the last few years, are standing out not only at a national level: a particular example is definitely the production system used by both the Volkswagen Group and Audi in the process towards carbon neutrality. The Aluminium Closed Loop project[1], which con-

sists in giving the aluminium industry waste back to the manufacturers in order to recycle it, has allowed achieving both the aim of contributing to company decarbonisation, and the one of revitalising resources that, otherwise, would have been impossible to use and, therefore, easy to eliminate. Depending on exactly this objective, there is also another interesting circular economy project by the Audi Group called Exchange 2.0[2]. In this project, the components used are brought back to the original quality level so that they can be sold as new replacement parts with a double benefit, in both environmental and economic terms.

The same theme of durability for everyday objects and of their reuse or recycling reaches the game world. Indeed, when they stop arousing interest in children, toys end up in the trash even if they work perfectly. This is a material waste and a massive environmental problem since 80% of toys (mainly in plastic) end up in landfills or incinerators, while the recycling percentage is very low. Rethinking toys from a circular perspective, avoiding pollution and emissions, recovering materials and extending the product lifecycle, is a subject which many start-ups, encouraging the reuse and the sharing of old toys, mobilise on. Some of these start-ups need to be mentioned: Rejoué[3], a French company that has recovered, repaired and resold toys since 2012; in the same direction heads Toy Cycle[4], a Californian company that has realised a platform where it is possible to buy second-hand, recovered and repaired toys; even Lego, in recent years, encourages the sharing of bricks that, today, almost always hand down from father to son, but the objective – characteristic of the Lego Replay Initiative[5] – is to encourage to donate bricks no longer used to children's charities. This concept is more and more supported by the idea of using a toy without possessing it effectively as if it were a fully-fledged service.

An idea that Happy Baton[6] is trying to put into practice by sending every month, to the families signing up for a sort of subscription, a box with appropriate toys for the different ages and needs. At the end of the month, the toys inside the box are returned in expectation of new ones. The same principle is also used by Whirli[7], a British company that has introduced the use of tokens as bargaining chips for toys. A key step on the path to a real circularity of toys concerns a different structure in the way they are produced. Green toys[8], a Californian company, uses only recycled plastic – like yoghurt pots – to make toys. The same path is undertaken by MGA Entertainment, the toy industry giant – which has a turnover of 9.1 billion dollars and offers, among its leading products, the Bratz dolls – by activating a collaboration with Terracycle (the most famous recycling company in the USA) to reassure the recycling of both toys and packaging. These are some examples of how to develop systems centred on circularity, with highly sustainable purposes and enabling the activation of strategic synergies and collaborative services.

It is possible to talk about the circular economy even starting from a particular material. For example, the viscose produced from cotton waste, rather than from wood pulp, not only avoids to cut down trees but especially allows to enhance waste. In-

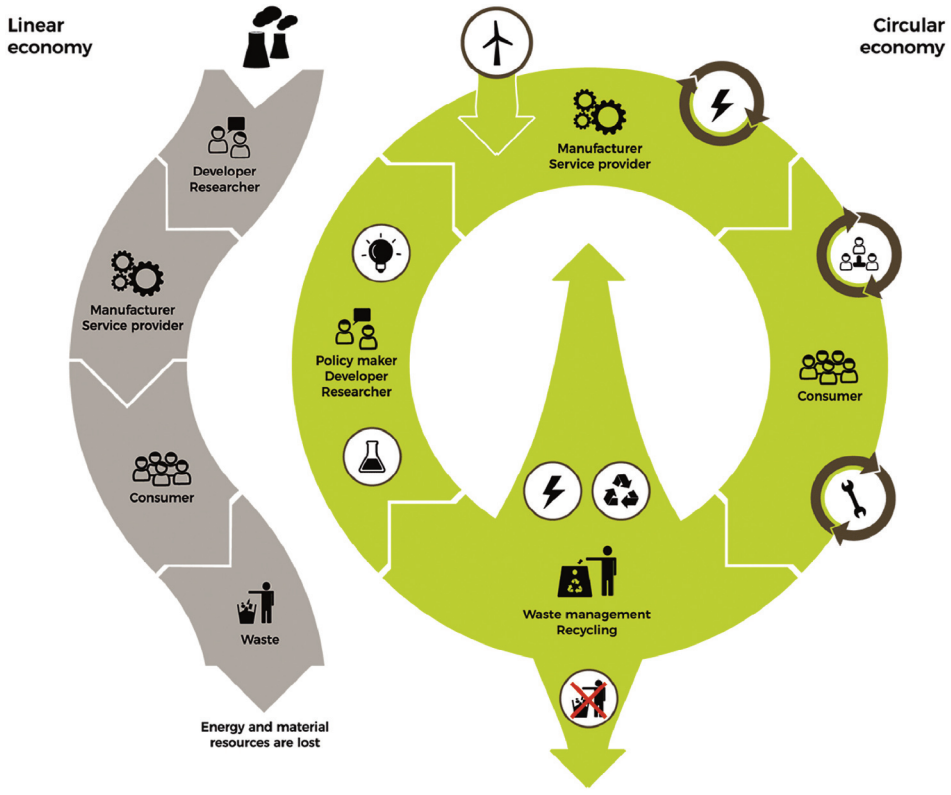

Fig. 1 | Circular Economy in the Danube Region (credit: MOVECO Design, J. Lindl, Ideen die Fruchten, 2018).

deed, this is the path many companies have decided to undertake. One of the first companies to choose a 'circular' viscose is Lenzing[9], which has introduced some technologies in the production process to decrease the wood pulp previously used, by replacing it with cotton waste. In Italy, Monvania[10], one of the main companies in the textile district, has been focusing on the recycling of cotton linter – cotton scraps, in other words, useless fibres with a length of fewer than 16 millimetres – to obtain viscose. According to some estimates, about 40% of the cotton fibres – merging production waste, pre-consumer and post-consumer waste, up to the unsold stock – get lost. In most cases, waste ends up in landfills and incinerators. According to Monvania, in terms of performance, the linter additionally makes a whiter, slightly thicker string, obtaining a brighter viscose particularly pleasant to touch, not to mention the lower environmental impact, even in the production phase: the process requires less water consumption and use of chemical products compared to the traditional production. In this way, the material is enhanced by respecting the environment and trying not to misuse what this offers.

Finally, the project CAmbieReSti?[11] (acronym of Consumption, Environment, Energy Saving, Lifestyle in Italian) represents one of the few examples of critical consumption encouraged by a public institution, since it is sponsored by the Environmental Department of the Municipality of Venice and funded by the Ministry for the Environment and the Protection of the Territory. In this project, the testing phase had, as absolute protagonists, some families that, with local support groups specially trained, allowed to create a social network which, at the end of the testing phase, was able to organise itself again in order to continue the path undertaken in a self-managed and independent way. CAmbieReSti? has also managed to support, in parallel, the creation of a social economy Network between producers and consumers, considered essential in order to turn the conscious need of another consumption into real practices. The territory is therefore conceived as a context extended to social issues and even to the behaviour of human settlements with regard, for example, to civic education, respect of the laws, hospitality: all these qualitative elements are the essence of the so-called territorial identity (Figg. 2-4).

In the Sustainable City, designed by Magatti, major personalities are the ones who facilitate the development of human, social and environmental resources combined and are responsible for their society also in the future; while minor personalities are the ones who consume the resources without regenerating them (Magatti and Gherardi, 2014). At the centre of the city, there is a balanced ecosystem, based on human and planet health. The common good is conceived in terms of human development, intended first of all as an opportunity to cultivate transcendence and embody a value

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Fig. 2 | One year of the Audi CO_2 program, Audi saved around 90,000 tonnes of CO_2 on balance by the aluminum closed loop at the Neckarsulm site (copyright: Audi AG Rights, 2018).

Fig. 3 | Lego Replay Initiative (credit: LEGO, 2020).

Fig. 4 | Monvania homepage website, cotton linter detail (credit: Monvania).

in an action, even an economic one. There are man-sized territories and cities where is promoted a lifestyle in which individual needs can match with the necessities of the community. Everything is framed within a vision, not only passive but also active for the citizens (Magatti and Gherardi, 2014). There are territories where active in-

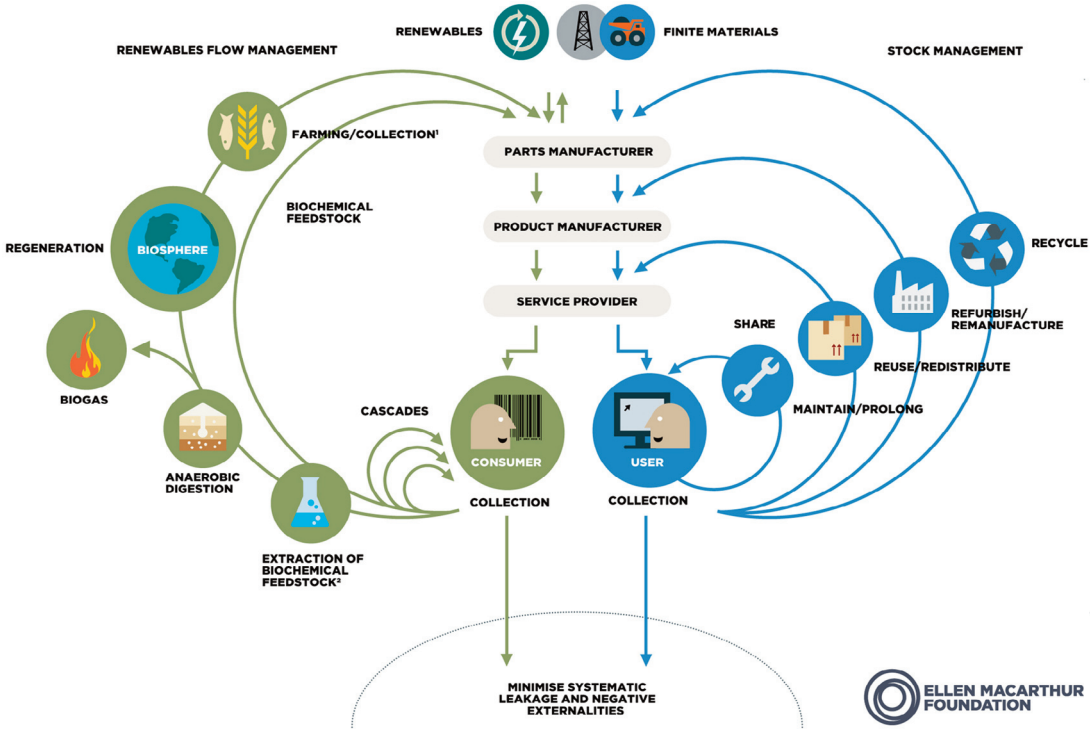

Fig. 5 | Circular economy systems diagram (credit: Ellen McArthur Foundation, drawing based on Braungart and McDonough, C2C, 2019).

dustries and companies evolve towards more and more competitive levels by using all the tools necessary to make this change happen, such as technological innovation and the synergy among private companies, public authorities and research institutes. Human capital is enhanced by stimulating creativity, professional growth, flexibility, cosmopolitanism and open-mindedness. Interaction and constant dialogue are encouraged to highlight the concrete needs of the citizens and make the resulting response efficient and effective.

The territories with a strategic vision of their own development are therefore able to define their lines of action, involve the citizens in some issues of public relevance, support awareness-raising socio-cultural actions, improve environmental quality and use technologies to digitise and innovate, promoting transparency within government procedures and the openness and sharing of data streams (open data). Smart territories where citizens live a good life and life quality is consequently guaranteed; the implementation of a territorial model which ensures citizens access to culture, creativity, information, probably using the innovations offered by the new technologies. As a consequence, there is a new economic model which tries to combine the needs coming from

the bottom-up society, driven by strong ethical reasons and by the awareness that some procedures need to be changed. To do this, the territories should become an incentive for the activation of local synergies and a link for the various actors of the supply chain; inside the territories, there should be physical spaces where new companies can contribute to the important start-up phase and their sustainable development (Fig. 5).

Territorial networking beyond Industry 4.0 | Starting from these initial considerations and also including the complex scenario of Industry 4.0, which is shaping the new wave of Society 5.0, it is clear the importance of relationships among the active subjects of the current productive panorama and the birth of new forms of interrelation among them. Simultaneously with this technological growth, there is an increasing product dematerialisation which is more and more oriented toward a system and an experience planning with an eye to connection and network. Consequently, the context where planners – designers – act has now changed since it designs not only products but also complex systems, services, interactive products, integrated communication models, relationships. This does not mean that products will be gradually removed, but on the contrary, they will be so enriched and adapted for specific contexts that they will be able to relate with a single element as well as with the whole, including the users engaging with the system. Designers, always with greater attention, have to plan these relationships since the modality described above not only will take place within the business management of the production cycles – related to processes, marketing, sale and after-sale – but also will develop especially outside the companies, in order to facilitate smart production, linked with all the actors in the territorial manufacturing system that will be part of new supply chains in the future.

This is combined with the spread of new ways of thinking, creative approaches and innovative business systems, such as Social Innovation and Open Innovation, sharing economy and commons, crowdfunding, peer-to-peer theory, lifelong learning and much more, which have led to the birth of new actors – including makers, co-working spaces, start-ups and spin-offs – with innovative skills from a cultural, social and even technological point of view, thanks to which they meet more than just particular market needs. These considerations show a scenario which allows analysing in-depth the current sources of innovation capable of generating new knowledge and understanding the role of designers in this context, whether it is always the one of the knowledge catalysts or a different one, and the methods and tools which can and have to be used (Germak, 2008).

Particular attention should be paid at the role of design as a discipline traditionally capable of managing – and planning – complexity, developing nowadays, as expressed by Manzini (2015) in his book Design, When Everybody Designs, in a project scenario filled with new ways of creative realisation which uses different approaches such as Open Design and Co-Design and for which, as explained by Verganti (2009), innovation is not only the one driven by technological development or market impulse

but the result of a third synergy, that is to say a radical change in perspective introducing a new way of competing: Design-Driven innovation, headed by design, creates new meanings. Precisely these new meanings deserve an insight and a collective claim on behalf of the entire Design scientific community, to understand what will happen in the future of the discipline, to try to make disruptive and strategic products and services more and more oriented toward the 'interpreters' of the market – from researchers to technology suppliers, from artists to designers – since they are able to grasp, mould and reverse the meaning of things in a sector; it is important to wonder why in Italy there is not a structured – regional or national – system yet, aiming at promoting design research in order to develop useful connections among the different actors in the overall panorama and to reconnect them with the business frame of reference (Verganti, 2009).

Considering that technologies and scientific research, at the basis of the same social and economic development, evolve anyway and independently following more or less radical, but quick, implementations in a flow constantly in progress (Santachiara, 2016), only through the realisation and the corresponding application of these innovative technologies, there are implications for society leading to – positive and negative – mutations, which can make a change in many cases. This particular turn of events shows the reason why the social system and its institutions very often appear to be delayed compared to the technological progress. This progress not only represents a combination of mutations and technological innovations, but also reveals a connection among technological innovation, and particular social contexts and the interaction that users have in these contexts and with these technological artefacts.

The origin and the spread of technology involve, therefore, complex harmonising processes among cultural, traditional, social, economic, and political elements, despite the differences that are created by combining them and that make this kind of action so difficult. The role of training will be essential since it allows to reduce the new digital divide which is emerging between who, despite having digital objects and getting in touch with technological systems, is crushed by them and who, on the contrary, is able to manage technological innovations strategically, by using a new and integrated type of knowledge.

There are many types of knowledge. Traditionally, knowledge is divided into tacit and explicit. Tacit knowledge is considered the hardest to deal with since it lies in one's mind (Polanyi, 1962), this means that the focus needs to be put right on the management of the latter form of knowledge. In this respect, by projecting the reasoning related to knowledge in the territorial networking field, it can be said that the individual represents the smallest organisational unit and, at the same time, is the holder of tacit knowledge, which is fundamental to understand how organisations manage their knowledge and how they gain it. Nonaka e Takeuchi (1997) underline the fact that tacit knowledge and explicit knowledge are not totally separate but mutually complementary entities. Tacit knowledge and explicit knowledge, actually, interact with each oth-

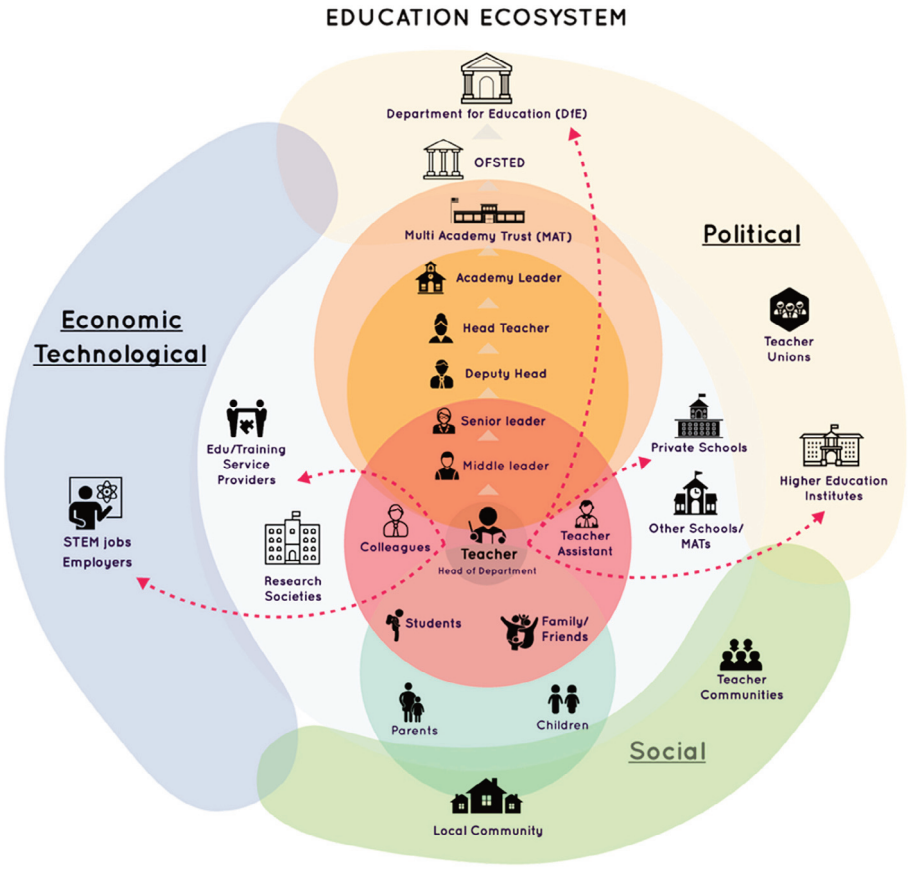

Fig. 6 | Education Ecosystem (credit: Royal College of Art, London, V. Koo, 2017).

er through the creative activities of human beings. A conversion that enriches, in terms of quantity and quality, the individual knowledge and, consequently, the knowledge of the organisation to which he/she belongs.

Following Spender's (1996) and Grant's (1996) studies relating to business knowledge, the most important resources within an organisation are its tacit knowledge and its explicit knowledge. Grant highlights the fact that companies can be considered as social communities specialised in both knowledge creation and knowledge transfer among the members of an organisation. These processes are realised through the transformation of organisational inputs into outputs, by using the knowledge of the organisations. As a result, all the processes concerning knowledge creation, acquisition, preservation, and use take place within these social communities. If Grant thinks that the role of society is to coordinate these processes within an organisation, in order to generate a competitive advantage, then knowledge exploration and sharing in society

are the most relevant aspects to manage this intellectual resource. The organisations have to recognise the need to create an environment where knowledge can be shared with the workforce, thanks to a constant update and a continuous renewal of tacit knowledge, in order to get the necessary resources to maintain their strategic flexibility and the management of their own knowledge capital (Fig. 6).

What can be done to encourage and design a long-lasting industrial rebirth based on both a cultural and technical-scientific basis? First of all, it will be essential a strong and pervasive spread of private and public investments led by the innovation of productive activities and territories, which will be difficult to realise without adequate industrial and territorial development policies, apart from traditional incentives to individual companies or territories. University will play a key role in this requalification and rebirth, by strengthening relationships intended to promote the introduction of scientific, technological, creative and organisational input within production processes; by integrating these inputs into projects including a close collaboration between universities and Made in Italy industrial districts, high-tech centres and creative urban industries; by contributing to the renewal of the role the major urban systems can play in bringing out multicentre (metropolitan, regional and national) innovative platforms thanks to their social composition and to the merging of network infrastructures (Cappellin et alii, 2017). Moreover, to strengthen the dissemination and the efficiency of these devices, some initiatives such as the ones with national technological clusters and others at a metropolitan and regional level, should be consciously used as innovation and culture platforms for local development. It would be necessary to maintain action persistence, commitment towards the reduction of bureaucratic burdens for universities and companies, a vision on how important the reinforcement of the third mission is, together with a university refinancing.

All this could make the difference and promote a rearrangement of the available resources in trajectories of industrial leadership with virtuous relationships among universities, industries and territories. In conclusion, the image of the territory that emerges is that of 'relational landscape', characterised by production and training activities, where the exchange of ideas within the production process is essential. As a consequence, an environment made of cultural integration and economic collaboration will emerge, where innovative process and transformation practices will be established, relying on a kind of multi-sector and integrated offers (Morelli and Sbordone, 2018).

The future paradigm | In the last decades, the concept that history does not lead toward the assured progress, but an extraordinary uncertainty, has been clarified. The change in human condition requires a paradigm change, a change in our vision of the world. This need to change paradigm becomes more and more urgent since the dogma of infinite growth is drastically questioned by the ongoing European and global crisis, by the dangers caused by a short-sighted technical and scientific development, and by the excessive consumerism which makes individuals and communities unhappy. It is

necessary to rethink of, explains Ceruti (2018, p. 79), progress, growing, globalisation ideas within a complex perspective, in order to conceive irreducible multiplicity of dimensions intertwined in the new human condition. It is essential to measure growth in different terms from the purely quantitative ones of the GDP, by putting in place the indicators of human development. The current development model, which does not consider human development, is completely inside the coalitions which repeat the zero-sum games: the individual success is fuelled at the expense of common good.

In the book La Nostra Europa, Ceruti and Morin (2013) argue that it is necessary to develop techno-economic policies within a logic of civilisation and planetary politics, which has as its macro objective the common good, and as a key task the 'globalising solidarity'. It is important to look for culture and anthropology able to rethink of the idea of progress since the politics of the last century has been stuck in the logic of zero-sum games: a part wins at the expenses of the others. Unfortunately, this has happened not only at an international level but also at the level of individual national companies. Today, in the era of planetary interdependence, continuing these 'games' is devastating and inconsiderate if one cares about the sake and future of humanity, because the actors of zero-sum games – actually – all loose, by bringing out the risk that there will be no winners and losers, but just losers. Humanity, therefore, is called today for the first time in history to step out of the war and unconditional environmental exploitation age, typical of the paradigm of zero-sum games, to finally generate a collaborative paradigm of positive-sum games.

Obviously, it is not enough to regenerate a culture of tolerance, it is necessary to do more: it is essential to reaffirm that the others, the gaze and the ear of the others, are the driving force and the precondition of our own development (Ceruti, 2018, p. 81); as suggested by Pope Francis, today the challenge is to conceive and live the planetary community in a positive way. A 'culture of encounter' has to arise, characterised by comprehension, connection, hybridisation and also a constructive conflict on diversity. Without these characteristics, there is no culture, there is no social life, there is no spirituality. Humanity would cease to exist. The sense of belonging, shared by all people and territories, needs to be developed as an ethical and political task fundamental to build, following Edgar Morin's expression, an 'Earth civilisation' aiming at the promotion of an anthropological evolution, made of cohabitation and peace.

Design, as a discipline traditionally able to manage and plan complexity, is developing within this – even conceptual – scenario filled with new forms of creative implementation which use new – for the most part still unstructured – approaches deserving an insight by the Scientific Community to understand what will happen in the future of the discipline and which methods and tools will be the best to create strategic products and services oriented to the new ways of living everyday life. Design – especially the strategic one – represents the bridge between technological innovation and society, capable of planning users' interaction in specific contexts characterised by special technological solutions (IoT). From this perspective, technology is designed as a social fact

and, in order to spread the application of new technological discoveries in different social contexts, it is necessary to expand their use within training contexts where these are a strategic tool for the creation of an emerging class, with a greater cultural capability and able to avoid potential negative effects in the future (Ceruti, 2018).

To sum up, it is possible to affirm that the social distancing from the assured progress and the continuous orientation towards uncertainty clearly show how problems and crisis have to be experienced as opportunities for growth and development, as well as new spaces for experimentation and creative design. Even in the face of the period of social distancing caused by the Covid-19 pandemic, the risk of a value collapse and the current social structure is visible. It is necessary to go beyond distance, trying to reinterpret and redesign it, to experience new forms of social distancing which come closer, mentally speaking, to recollection situations and meditation retreats; by using new methods and tools as a result of cross-fertilisation and an interdisciplinary – or transdisciplinary – approach attempting to join different scientific sectors, sometimes even distant one from the other. For this reason, today, we have to try to perceive progress as a challenge and a potential achievement, as a result of our choices and our will, to develop renewal capacities, typical of humanity.

Notes

1) For more information see: modo.volkswagengroup.it/en/vision/aluminum-closed-loop-a-virtuous-cycle-to-reduce-waste-and-emissions#:~:text=Aluminum%20Closed%20Loop%2C%20a%20virtuous%20cycle%20to%20reduce%20waste%20and%20emissions,-Volkswagen%20Group%20Italia&text=Audi%20manages%20the%20aluminum%20it,tons%20saved%20in%202019%20alone [Accessed 16 December 2020].

2) For more information see: audi.com/en/company/sustainability/core-topics/value-creation-and-production/exchange-2-0.html [Accessed 16 December 2020].

3) For more information see: rejoue.asso.fr/ [Accessed 16 December 2020].

4) For more information see: circulareconomynetwork.it/2020/09/allunghiamo-la-vita-a-teddy-bear/#:~:text=Tra%20queste%20la%20francese%20Rejou%C3%A9,giocattoli%20usati%2C%20recuperati%20e%20riparati [Accessed 16 December 2020].

5) For more information see: lego.com/en-us/aboutus/replay/ [Accessed 16 December 2020].

6) For more information see: happybaton.com.hk/ [Accessed 16 December 2020].

7) For more information see: whirli.com/ [Accessed 16 December 2020].

8) For more information see: walmart.com/browse/toys/green-toys/4171_1111647_132910_6365011?&adid=22222222254430577908&wmlspartner=wmtlabs&wl0=b&wl1=g&wl2=c&wl3=420276840403&wl4=dsa-872056265706&wl5=1008311&wl6=&wl7=2840&wl8=&veh=sem&gclid=CjwKCAiAi_D_BRApEiwASslbJy94rad-PtQN0mkcGdEdZrXHbJ5FPiAQrVpm8vD-vKq8lOgG3nDsnXhoChlcQAvD_BwE [Accessed 16 December 2020].

9) For more information see: circulareconomynetwork.it/2020/08/tessile-la-viscosa-diventa-circolare/#:~:text=Una%20delle%20prime%20aziende%20a,sostituendola%20con%20scarti%20di%20cotone [Accessed 16 December 2020].

10) For more information see: monvania.com/ [Accessed 16 December 2020].

11) For more information see: sinanet.isprambiente.it/gelso/banca-dati/comune/comune-di-venezia/cambieresti-consumi-ambiente-risparmio-energetico-e-stili-di-vita [Accessed 16 December 2020].

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