CO3: Digital Disruptive Technologies to Co-create, Co-produce and Co-manage Open Public Services along with Citizens

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Comparative Glossary of CO3 Terminology

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Authors List

Partner	Author(s)	Sections
UNITO	Rocco Alessio Albanese, Alessandra Quarta, Alberto Guffanti, Guido Boella	1, 2

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1. Introduction

Experiences of co-creation, co-production and co-management of urban commons and public services are becoming a widespread reality throughout European urban contexts, in connection with the strategic goals established in 2016 with the signature of the Pact of Amsterdam and the launch of the Urban Agenda for the EU. CO3 can be traced to such a framework, since this project is experimenting the potential role and the possible impacts of some major disruptive technologies on institutional systems characterised by the attempt to enable as much as possible citizens' activation, social inclusion and cooperative relationships between privates and public sector at the municipal level.

Of course, the Covid-19 pandemic has been a serious obstacle in the development of all those policies based on intense social interactions. Lockdowns and measures such as social distancing have deeply affected the life of entire communities and the very possibility to take care of neighbourhoods, commons and public services at the urban scale. The development of CO3 has been somehow affected as well, since some adaptations in the concrete experimentation of the interplay between disruptive technologies, urban commoning and collaborative administration have been necessary. Nevertheless, the challenges caused by the sanitary emergency have also strengthened solidarity-based forms of participation, so that new initiatives of commoning and of co-production of public services have been taking place since March 2020.

In sum, despite such complications the domain of co-creation, co-production and co-management of urban commons and public services has proved to be a vibrant and promising one at multiple levels. A precious dialogue among active citizens and social movements is ongoing across different municipalities and countries, thus enabling a bottom up dissemination of the most innovative solutions in terms of grassroot collective agency. Growing debates are taking place within academic communities, so that a renovated transdisciplinary approach - combining law, economics, urban sociology, architecture, urban planning, ICT and the like - is successfully arising as a new complex perspective about the present and the future of urban systems and communities. Last but not least, the European Union has been increasingly focussing on the crucial role of urban contexts, as the funding of programs such as UIA (Urban Innovative Actions) shows. In this respect, in recent years municipalities have been allowed to develop a variety of projects aimed at reinforcing social cohesion and at creating new forms of cooperative democracy. Local administrations have been encouraged to meet as well, so that the comparison of municipal policies and the dissemination of local experiments have been made possible even at a rather "bureaucratic" level.

The consequence of such an overall process is that a European set of legal arrangements and institutional solutions is arising in the domain of the co-creation, co-production and co-management of urban commons and public services. A variety of specific tools - such as new administrative procedures and quasi-contractual agreements in a legal perspective; or the experimentation both of tactical urbanism and of innovative technologies in the field of urban planning - is implemented in several urban systems, so that one cannot ignore the existence of effective differences among European local frameworks in pursuing similar objectives of policy. However, from the point of view of comparative analysis of law differences can be appreciated in two senses. On the one hand, understanding different arrangements is a major condition for effective processes of benchmarking, thus for individuating and enhancing the most successful and scalable experiences within a complex reality. In this first sense diversity (rather than uniformity) is synonymous with richness, since pluralist human systems have more chances to come up with satisfactory socio-economic, technological and legal solutions. On the other hand, at a deeper level

comparison can help to assess whether some given differences among legal categories and institutions are superficial or structural. In this second respect, the "common core" methodology - the attempt to compare and evaluate legal institutions in light of their functional capacity to solve concrete factual issues in similar ways and with similar outcomes, regardless of the rather formalistic elements characterising different domestic legal systems - is capable of highlighting commonalities that can be hardly noticeable or even hidden.

In summary, already today active citizens and Public Administrations, scholars and practitioners can foresee the future possibility to establish a European common core of the law of the co-creation, co-production and co-management of urban commons and public services.

Within such a complex and evolving framework it was worth creating a first concise European "comparative legal glossary" aimed at presenting "status of the art" in the fields of urban commoning and of co-management of public services through gathering commonalities emerging at the local levels as well as those most innovative experimentations combining the "traditional" tools of collaborative administration with the use of disruptive technologies, whose potential has been highlighted during the development of CO3.

Therefore, this comparative glossary is intended to provide relevant actors (citizens, NGOs, companies, civil servants, public institutions) as well as a broader public with a comprehensive and accessible guide to the domain of co-creation, co-production and co-management of urban commons and public services, within the framework of CO3. In this sense, some specifically technological contents are part of this glossary and are supposed to complement other rather legal contents. In fact, it is our conviction that relevant actors are called to have a basic knowledge of the major disruptive technologies: such innovations will hopefully become a pillar in the domain of collaborative administration, so that it is important that all the subjects involved in these policies could be familiar with the functioning of disruptive technologies and some of their foreseeable legal implications.

In terms of cultural discussion and of policies, the hope is that this piece of research could constitute a useful step forward for the increasing acknowledgement of urban commons and of cooperative provision of public services not only as innovative legal and institutional devices, but first and foremost as means of strengthened social cohesion and of democratic renovation both at the European and at local levels.

2. Glossary

ACTIVE CITIZENS

Active citizens are the people who decide to take initiative in order to co-create, co-produce and co-manage urban commons and public services. Their practices are not for profit. Citizens take action in order to create, expand and reproduce social cohesion. In particular they aim at providing themselves and local communities at large with affordable and non-market access to goods and services. As individuals or as communities (associations as well as informal groups), they also experiment forms of direct and bottom up management within the public sphere, beyond rather traditional bureaucratic models. In this respect, active citizens are not only long-term inhabitants of a neighborhood or of a city: even foreign people (who don't take part in local elections) and other city users (such as students at University) can always become active citizens.

By taking action in such an inclusive manner, active citizens produce participative innovations in urban democracies. They bring Public Administrations to adopt new mentalities and approaches toward citizens' wills and expectations as well.

The increasing acknowledgement of the legal relevance of the contributions offered (as well as of the social, environmental and economic values generated) by active citizens, especially at the municipal level, is part of a broader paradigm shift. Indeed since 2016, with the adoption of the Urban Agenda in the framework of the Pact of Amsterdam, EU urban policies have been enhancing the role of participative democracy and of ecological awareness as two among the major pillars of a new urban life, based on long-term sustainability and social cohesion.

In this respect, collective actions and social practices carried out by citizens - often in informal manners - are currently seen far differently than in the past. According to the former conception, such activities used to be challenged by Public Administrations. In some cases, they eventually could - and they still can, of course - be deemed to be relevant to criminal law by the judiciary. Nevertheless, alongside such a negative approach a new positive view of citizens' direct initiative is arising. Bottom up and cooperative attempts to improve life quality and social cohesion within neighbourhoods and cities are more and more acknowledged and empowered by local authorities.

In many European local contexts sets of innovative legal arrangements have been tested. For instance, under Italian law more than 200 Municipalities adopted local Regulations about the care and co-management of urban commons. Lacking national statutory provisions in this regard (at the State level, the first acknowledgement of practices and experimentations relevant to urban commons occurred with Art. 10 Decree Law 16 july 2020, no. 76, providing a regulation of temporary uses), local Regulations have revealed a great potential by allowing thousands of citizens to take care of their neighbourhoods and cities, in the framework of innovative and legally binding quasi-contractual relationships with Public Authorities (see: "Collaboration pact"). In other countries similar initiatives are ongoing, among which one can notice the experimentation in Barcelona (Spain), which has been promoting a comprehensive policy called "Citizen Asset Programme", and the major example of Ghent (Belgium), with its ambitious "Commons Transition Plan". Of course, other challenges are at issue throughout European urban systems. This is the case of the delicate dialectic between the emergence and the need for protection of temporary collective uses - that is commons-oriented relationships between citizens and urban spaces - and frequent conflicting capital-driven city developments, where the latter ones often tend to exploit the use values generated in a neighbourhood by communities and to transform them into exchange values to be accumulated.

The increasing centrality of active citizens in European discourses about the renovation of democracies, as well as in the everyday life of cities, is the product of a variety of factors. First, widespread structural transformations in urban systems - such as deindustrialisation and long-term demographic changes - have been the bases for the rise of issues like the diffusion of urban voids and their externalities. Large discussions on the potential and the ambiguity of urban regeneration and tactical urbanism have arisen in such a context, leading to an increasing number of theoretical and practical contributions in the domains of law, sociology, urbanism etc. Another element must be considered. The overall institutional crisis that has been characterising the current century - with huge difficulties for public budgets, as well as for the role of "community organizers" played in the past by political parties - has produced strong incentives for the research of innovations in the methods and the tools of democracies.

AUGMENTED COMMONING AREA (ACA)

Augmented Commoning Area (ACA) is a key concept in the framework of CO3, since it aims at condensing in a synthetic figure the overall complexity arising from the interplay between the objective of promoting widespread forms of co-creation, co-production and co-management of

urban commons and public services (on the one hand) and the implementation of disruptive technologies in fostering such goals (on the other hand).

An ACA can be defined as a *phygital* public space (this meaning a space structurally characterised by both physical and digital elements) where different stakeholders - namely active citizens, private actors, public authorities and the like - can participate, engage and use the technologies implemented within CO3 in activities of co-creation, co-production and co-management. The insight at the base of such a concept is that it is possible and desirable to combine urban commons with the disruptive potential of some major novel technologies. The former can be seen as an emerging legal institution and social practice, as well as a major opportunity for reshaping democratic functioning and citizens' role at local levels (see: "Urban Commons"). The latter is about the way in which disruptive technologies can allow unprecedented forms of interaction in the public sphere, thus entailing both opportunities and uncertainties for the traditional forms of local governance (see: "Disruptive Technologies").

In the perspective of CO3, augmented reality (see: "Augmented Reality") is the technological infrastructure capable of combining the "offline" innovation of urban commons with the digital frontier of technologies such as interactive democracy and blockchain. In this respect, an ACA is a novel and open meeting space, which is not subject to hierarchical and bureaucratic organisational criteria and is also enriched by the possibility to experiment digital forms of interaction.

On the one hand, the physical dimension of an ACA is supposed to entail and promote the major features of co-creation, co-production and co-management, such as the focus on generative and cooperative relationships with resources and within communities, as well as the attention for the collective utilities generated by goods and provided through the organisation of public services (see: "Commoning"). On the other hand, the introduction of digital elements and informations in public physical environments can be seen as the base for a user-friendly and unprecedented forms of active engagement in the public sphere. In this sense, an ACA allows new social interactions, combining physical presence of citizens with augmented reality and its features. For instance, objects in the physical space can be converted into access points to the augmented reality experience, thus bringing citizens to an complex digital platform capable of incorporating different disruptive technologies that are supposed to virtuously interact with the offline space itself.

Such a circular interplay between digital tools and physical spaces implies that the basic and general concept of ACA must be detailed and contextualized in order to be effective in each use case. In this respect CO3 has demonstrated (for example see: "Grocery On-hold") how a hybrid environment such as the ACA can be adapted to the peculiar constraints and opportunities of a given local context, so that every stakeholder (citizens, Public Administrations, companies and the like) can be provided with a geolocated set of disruptive technologies to be used in order to reach innovative forms of co-creation, co-production and co-management of urban commons and public services.

AUGMENTED REALITY

Augmented Reality (AR) can be considered as one of the major and most renowned disruptive technologies, since it has been very successful with its use in some video games. Of course, AR can be largely implemented in many economic and social activities. For instance tourism can benefit from AR since visitors can be guided through different GPS points of interest in a touristic place capable of showing digital information over the real-world image. Moreover, in the field of education augmented reality can foster learning processes by enabling students to have a direct (although

digital) perception of the topics they are dealing with (e.g. AR can facilitate the study of the anatomy of the human body through the creation of "augmented models").

Such examples show how, in general terms, AR allows the creation of a hybrid environment, in which information and virtual objects merge with reality. For the users this means an experience characterised by unprecedented complexities and richness, since an entirely new set of digital informations and assets supplements their natural perception. In this respect, the implementation of AR can eventually lead to a major expansion in social interactions, with the creation of a "mixed reality" in real time.

These opportunities are potentially crucial in the domain of co-creation, co-production and co-management of urban commons and public services. In connection with other complementary disruptive technologies, such as interactive democracy and tokens, AR can create unprecedented forms of interaction among citizens and between citizens and Public Administrations within the public space. For instance, public authorities could exploit augmented reality in order to make "visible" the future outcomes of some public works and land developments within an urban context, and thus to collect relevant suggestions and contributions from the citizens. Moreover, citizens could use AR techniques in order to individuate urban commons and to provide Public Administrations with digital proposals about possible collective uses of abandoned and/or under-used pieces of an urban neighbourhood (see: "Urban voids").

BLOCKCHAIN

Blockchain technology is a ledger database distributed by and accessible to all the nodes of a peer-to-peer network, which serves as an irreversible and incorruptible archive of a continuously growing lists of transactions which are ordered into blocks. The innovative feature of this technology, based on the ideas of an anonymous legal-computer science expert known by the pseudonym Satoshi Nakamoto, consists in the fact that the transactions registered on the database can be controlled by the nodes of the network without requiring oversight by a centralized controlling authority. The ledger is replicated among the nodes of the network and is simultaneously updated each time a transaction is verified and accepted by the community. The consensus between the nodes on the status of the ledger is guaranteed through the implementation of a distributed consensus algorithm. Such algorithms are designed with the goal of guaranteeing the integrity of the stored data without resorting to validation from a central Trusted Third Party. The most widely used consensus algorithm in public blockchains (like Bitcoin or Ethereum) is the so-called Proof-of-Work (PoW) algorithm, first introduced in the Bitcoin white paper. In the PoW algorithm the addition of a new block to the chain is tied to the solution of a cryptographic puzzle that, through the associated energy consumption, ties the process to a real-world cost, and rewards the successful miner node with newly minted cryptocurrency tokens. The CO3 project blockchain infrastructure, on the other hand, is based on a different consensus algorithm, a so-called Proof-of-Authority (PoA) algorithm. In PoA algorithms only pre-authorized nodes can add new blocks to the chain. While PoW algorithms are the choice for most public blockchains, PoA algorithms are better suited for permissioned (consortium) blockchains, like the CO3 one, as they reduce to a minimum the energetic consumption associated to blockchain infrastructures and allow better scalability, at the expenses of the decentralization of the system.

This complex system should guarantee transparency (because the registers are distributed to all users and simultaneously updated for each transaction), strong, though not absolute, immutability (because once the transactions are registered, they cannot be modified without the consensus of

the majority of the nodes), temporal certainty (because the transactions have timestamps) and reduced risk of loss of information.

While initially developed only as a mechanism to create an alternative, virtual currency which is not legal tender, blockchain has subsequently become the technological layer upon which users may elaborate and perform self-executing computerized transactions, widely known as smart contracts. By inserting the program code in which the terms of a certain negotiated agreement are reproduced into the blockchain, the transaction is performed automatically upon the occurrence of the circumstances foreseen by the same code. Smart contracts can have multiple applications: from on-line selling on eBay to the exchange of financial products and services, to the system of decentralized voting, all happening in real time.

CIVIC SOCIAL NETWORKS

Civic social networks are one of the disruptive technologies implemented in the framework of CO3 in order to foster citizens' activation and cooperative behaviours between individuals, groups and Public Administrations. Instead of maximising the role of idiosyncratic sentiments by showing and collecting individual opinions, civic social networks aim at bringing people together in a proactive technological framework. In this respect, these tools are centered on the public life which citizens can participate actively in. For instance, civic social networks can facilitate experiments of participatory planning at local scales; social cohesion in neighbourhood life, which is both the condition and the outcome of successful processes of commoning and collaborative administration, can be fostered as well.

The civic social network used in CO3 is FirstLife (https://www.firstlife.org/), a platform developed by the Social Computing group, a multi-disciplinary team coordinated by professor Guido Boella. Unlike the most part of social networks, Firstlife is not produced and implemented for profit, since it is a cooperative project developed by the University of Turin together with associations, Public Administrations, citizens and companies. Born in 2012 as a platform for public activities and constantly improved in the last years, Firstlife is a free and public civic social network aimed at empowering cooperative initiatives put in place by citizens, Public Administrations and private local actors. The CO3 project has been adopting Firstlife among other disruptive technologies in order to provide pilot experimentations and the CO3 app with an overall infrastructure for geo-localisation and online interactions. For instance, thanks to the potential of this civic social network citizens can participate in bottom up and crowd-based processes of mapping. Firstlife allows to geolocalise digital objects and tokens as well, so that citizens can appreciate the peculiarities of some urban spaces (e.g. a building collectively used for the provision of a co-managed specific public service) simply by having a look to the CO3 app and to Firstlife's digital features.

CO-DESIGN

Co-design can be seen as the most important methodological innovation and the major procedural tool in the field of collaborative administration and in the broader domain of the co-creation, co-production and co-management of urban commons and public services.

Where public authorities and private actors (citizens, associations, NGOs) choose co-design an innovative and cooperative legal relationship is established. Instead of building profit-based and market-oriented contractual relationships, with co-design Public Administrations and privates adopt a transparent and cooperative approach whose aims can be either the collaborative provision of public services and the co-management of commons. The parties to such contractual relationships do not pursue conflicting interests, since public authorities do not conceive the privates as selfish

counterparties acting in the market and the private parties do not enter such contracts in order to make as much profit as possible.

In light of these structural elements, co-design can be seen as a set of procedures and legal arrangements that take place out of the domain of competition law. In this respect, it is worth noticing that in principle private actors involved in co-design are not in an exclusive legal position: on the one hand, they could have to accept possible contributions (suggestions, interventions and the like) coming from other subjects aiming at collaborating in the co-production of a public service and/or in the co-management of commons; on the other hand, they cannot extract exclusive economic utilities from the activities of public interest they carry out by virtue of a cooperative contractual relationship with a Public Administration.

Meaningful confirmations about the relativity of competition can be seen at the EU level, so that the competitive market cannot be regarded as the sole and basic institutional criterion in the sectors of public services and collective utilities. In fact, the Treaty on the Functioning of the European Union contains two major provisions in Art. 14 and in Art. 106. According to the former, the crucial role of services of general economic interest "in promoting social and territorial cohesion" is explicitly acknowledged. The latter is even more important, since its second paragraph provides that "undertakings entrusted with the operation of services of general economic interest or having the character of a revenue-producing monopoly shall be subject to the rules contained in the Treaties, in particular to the rules on competition, in so far as the application of such rules does not obstruct the performance, in law or in fact, of the particular tasks assigned to them" (see: "Public Services").

Under Italian law a number of experimentations of co-design occurred in the last years. By building on a new reading of the principle of horizontal subsidiarity, reevaluated in light of solidarity and social cohesion objectives (see: "Horizontal Subsidiarity"), co-design has been implemented in the Italian legal framework in two manners. On the one hand, a statutory regulation of co-planning and co-design of some social services is provided by Art. 55 Legislative Decree , no. 117 (so-called Third-Sector Code). On the other hand, co-design is implemented as a process of transparent and cooperative negotiation, having a pivotal role in the law of urban commons and in the most effective experimentations in the field of the co-management of such goods. Such a systemic role of co-design has been approved by the Constitutional Court in two major judgments delivered in 2020 (judgments no. 131 and no. 255). According to the Italian Constitutional Court, co-design procedures allude to "a path of shared administration, alternative to profit and market: "co-planning", "co-design" and "partnership" (...) are steps of a complex procedure, which is expression of a new relationship between public and social-private sectors, not based on a simple *do ut des*".

COLLABORATION PACT

A collaboration pact is a quasi-contractual agreement between one or more Public Administrations and one or more active citizens. Such pacts have been increasingly acknowledged in the Italian legal framework since they are one of the major tools of the strategies of shared care and co-management of urban commons. The parties to a collaboration pact identify part of the city (e.g. a square, a park, a building) and/or an intangible good (e.g. the "atmosphere" of a neighborhood, the data generated by urban population) as urban commons, define the duration and the objectives of the collaborative relationship, distribute specific tasks and possible liabilities.

According to the Italian experience, the collaboration pact can be either a bilateral or a multilateral agreement. The basic type of pact is the first one, regardless of the number and quality of the subjects (individuals, informal groups, non profit organisations) that constitute the "active citizens" party to the pact. However, if the urban commons which is the object of the agreement is a private property the private owner must enter into the pact (trilateral agreement). Likewise, if the object of

the pact is relevant to the cultural and historical heritage the relative public Agency can become party to the (trilateral) agreement.

In general terms, active citizens are the main actors of a collaboration pact. The choice to take initiative, by individuating urban commons and/or by proposing a draft agreement, is usually up to the citizens (although solicitations carried out by Public Administrations can be possible). Moreover, active citizens are both the promoters and the first (but not sole) beneficiaries of those social practices of co-management of urban commons and co-production of public services (see: "Commoning") regulated by the collaboration pact. That said, the role of Public Administration is crucial too. Public managers and/or civil servants are the subjects mostly called to sign a pact on behalf of a Municipality. However, sometimes the conclusion of an agreement can be decided by political bodies: for instance, the urban commons that is the object of the pact has a huge symbolic value for the imaginary of a city; or there is the need for dealing with rather complex activities proposed by active citizens. Within such a cooperative framework, public bodies can also contribute to the best execution of the pact by making various supportive commitments, such as the provision of personal protective equipments or other tools as well as the contribution to the costs of energy bills (see: "Collaborative Administration").

Being centered on the legal status of urban commons as well as on their co-management, the collaboration pact constitutes an innovative legal relationship between public sector and privates. In particular such agreements are regulated and governed by contract law, even though they fall out of the domain of competition law.

Indeed, "standard" contracts between Public Administrations and privates are usually characterised by conflicting interests among the parties; by the fact that the formers provide the latter ones with exclusive legal entitlements over goods in public property; and/or by the public need for purchasing works, services and supplies from private companies active in the marketplace. In this respect, competition principles and rules (namely public and competitive procedures relevant to EU legal sources and implemented for selecting the private party to the contract) are generally welcome for these contractual relationships. On the contrary, a collaboration pact is concluded by building on converging interests, in order to arrange forms of inclusive and collective use for urban commons, and with the aim to provide urban people with non-market access to goods and services. In this respect, the collaboration pact aims at being a generative legal infrastructure, capable of putting in place innovative public policies, of fulfilling fundamental rights of the involved citizens, and eventually of creating inclusive communities.

From a more technical point of view, these peculiarities are at the base of the procedures that bring to the signature of a collaboration pact. Negotiations between Public Administrations and active citizens are a public and transparent space, which whoever is interested in the future co-management of the urban commons can access and participate in (see: "Co-design"). The pact itself, conceived as a quasi-contractual agreement, cannot be traced to the principle of privity of contract. The relationship between the parties to a pact is rather characterised by its openness. For instance, citizens of the neighbourhood where the pact is executed, who have been enjoying the positive effects of the care for urban commons, can decide at any time to become active citizens and to formally enter into the pact.

COLLABORATIVE ADMINISTRATION

Collaborative administration is an administrative pattern based on the research of cooperation and mutual trust between public authorities and citizens. The institutional choice of these actors to share resources and responsibilities is at the core of this set of practices and policies.

Collaborative administration is governed by a set of general principles. Some of them can be traced to the broader domain of administrative law. This is the case of publicity and transparency: according

to this principle, Public Administrations assure to the greatest extent the public knowability of all proposals, procedures, decisions and evaluations. Moreover, transparency is strictly connected with the openness of all procedures and the principle of inclusion and access, so that citizens (individuals, associations, informal groups etc.) can get involved at any time in collaborative initiative carried out by others. Further traditional principles are the equal opportunities and the non-discrimination ones, as well as the reference to trust and good faith, and to adequacy and differentiation.

Other principles seem more specifically relevant to the innovative framework of collaborative administration. In this respect, this administrative pattern enhances ecological methodologies and is governed by the idea of sustainability. Other recurring principles are informality (according to which cooperative relationships between public authorities and privates should comply with bureaucratic formalities only when the latter are mandatory) and civic agency. This last principle is remarkable because it shows how the aim of collaborative administration is to foster citizens' empowerment to the greatest extent. Nevertheless, as a kind of counterbalance for the potential of some implementations of civic agency, the principle of non-subrogation is provided as well. According to such a provision, in the application of collaborative administration public authorities are prevented from giving up their duties (e.g. those concerning the organisation and provision of basic public services), so that privates involved in collaborative projects cannot become integral substitutes of Public Administrations.

Of course, collaborative administration is a challenge both for Administrations and for citizens. Indeed, public and private actors of urban systems usually see themselves as counterparties in the socio-economic development of cities. This approach has been capable of creating a very mentality, fostering trends of institutional fragmentation and mutual skepticism and thus affecting democratic quality and effectiveness of urban governance. On the contrary, the collaborative administration paradigm gives incentives to restructure such traditional views, in order to reach more inclusive local democracies, to provide active citizens with clearer legal acknowledgment of their proposals and actions, to find new ways to solve conflicts about the transformation of neighborhoods and cities.

For these reasons, collaborative administration is an innovative paradigm, compared to those traditional conceptions of Public Administration based on the hierarchical and unilateral action of public authorities. It is also different from other relational models of administration, such as the "new public management" paradigm or those policies that foster privatisation and liberalisation of the production and provision of public services. In this respect, the rise of urban commons as a major legal institution has given concrete chances to conceive and implement new relationships among Public Administrations and privates. Such a model is somehow alternative to the institutional paradigm of market and competition law, being based on cooperation and inclusion. As the CO3 project is showing, the use of disruptive technologies can create unprecedented opportunities to enable citizens' agency and to experiment new cooperative ways of producing and managing urban commons and public services.

COMMONING

Commoning is the relationship between the utilities offered by commons (on the side of the objects) and the interests of each and every member of a community of reference (on the side of the subjects). This overall concept highlights that such relationships are structurally "mutual". Indeed, both commons and communities are not abstract entities. Some goods can be regarded as commons by virtue of the collective utilities specifically generated by some of their possible uses. Likewise, individuals can perceive themselves as part of a larger community of reference thanks to the collective use of some goods.

In this respect, commoning can be seen as that relational practice that leads to simultaneously isolate the capability of goods to generate and offer some crucial resources, and the connection between

such utilities and some fundamental rights of individuals and communities. By building on these findings, some of the major theoretical contributions on commons have been arguing that commoning should be qualified as a generative and open relationship even in the domain of law.

From such a perspective, the "generative" element is about the capability of commoning of assuring the flourishing of communities, without endangering the sustainable reproduction of the utilities generated by the commons. In other words, collective and inclusive use of a resource can be seen as an ecological legal relationship.Through adequate arrangements in terms of governance as well as of remedies, it should not end up creating the conditions for selfish over-consumption and irreversible depletion of the resource (according to Garrett Hardin, this scenario is known as the tragedy of commons). Moreover, the openness of this relationship is relevant to two practical outcomes. On the one hand, the legal construction of commons tends to refuse exclusive and identity-based conceptions of a community, although Elinor Ostrom showed with her work the importance of assessing criteria for defining the scope of a community emerging around commons (see: "Urban Commons"). On the other side, an open view of the community means that in principle each and every member should be entitled to access the commons in order to enjoy the utilities it offers, so that for the property rights concerning commons inclusion is the basic rule and exclusion is the exception.

The importance of such a dynamic and collective conception of commoning is particularly apparent in contemporary urban contexts. In fact, in recent times huge socio-economic transformations in Western cities and the rise of issues like the one of urban voids determined a renovated modernity of urban policies. In this framework, the urban regeneration paradigm has shown its ambiguity. At a general and rhetorical level, some very discussed urban processes, such as gentrification, are usually presented as vehicles of social innovation, aimed at providing a city or a neighborhood with sustainability and smartness. However, many scholars, social movements and citizens have been noticing some negative "side effects" of this form of regeneration, namely processes of dispossession of former inhabitants, risks of growing inequalities in the areas touched by urban transformations, and cases of *de facto* privatisation of public space. In this sense, the enhancement of legal and social relevance of commoning means that urban commons can become relevant to the framework of regeneration. As a consequence, a new model of intervention in urban contexts - a cooperative, inclusive and solidarity-based one - becomes possible and desirable (see: "Regeneration").

DISRUPTIVE TECHNOLOGIES

Disruptive technologies are about the impact of technological changes as well as the different conceptions of innovation in economics and in social sciences. While the origins of the deep interaction between development, innovation and disruption can be traced to Karl Marx's and Joseph Schumpeter's thought, the very concept of disruptive innovation currently refers to how an innovation is capable of destroying former processes and/or products, thus eliminating previous economic sectors and value chains by establishing new standards in economic life. In this respect, the usual example of disruptive innovation is the mass-produced automobile. Until the rise of fordism-taylorism, a crucial innovation for the huge reduction of cars' prices, automobiles were luxury goods and their sale had not been able to modify the structure of the transportation market. After the launch of the Ford Model T, the whole transportation market has been upset, since affordable automobiles quickly became a mass product and the very status symbol of the twentieth century.

In a narrower perspective, the idea that a new technology can be disruptive is connected to the possible implementations of such a technology. In fact, innovation processes are not deterministic and the impact of a new technology can depend on the timing of its launch (since innovations can become successful only after some failures or experimentations and some initial years of

dissemination) as well as on the overall economic ecosystem in which it is placed (so that a promising technology could be either useless let alone or disruptive if combined with other technological arrangements).

Of course, the internet and digital innovation are the current frontier of the interaction between our economic and social life and the disruptive impact of new technologies. It is well-known that the platform economy has radically modified our ways to communicate and to offer and exchange goods and services. Unprecedented value chains have arisen as well, as the economic relevance of data shows. Some innovative and debated technologies, such as blockchain (see: "Blockchain"), have not entirely shown their own disruptive potential.

Of course, alongside market-oriented and mere economic effects disruptive technologies can also have positive impacts in terms of amelioration of democratic institutions and social cohesion. In the framework of CO3, some major disruptive technologies relevant to the digital realm - namely: blockchain, augmented reality, geolocated social network, interactive democracy and gamification - have been implemented in order to create new forms of co-creation, co-production and co-management of commons and public services. For instance, solidarity-based and sustainable forms of food distribution can be arranged thanks to innovative transactions enabled by blockchain (see: "Grocery On-Hold"). Moreover, disruptive technologies allow Public Administrations and citizens to collaborate in order to establish new forms of urban modelling, since digital tools create unprecedented possibilities to envisage future forms and features of a neighbourhood or a city (see: "Urban Modelling").

The overall outcome of this complex interaction between disruptive technologies and collaborative administration can be found in the concept of Augmented Commoning Area, which alludes to complex local ecosystems aimed at renovating participative democracy through the unprecedented possibilities offered by digital devices (see: "Augmented Commoning Area - ACA").

GAMIFICATION

Gamification is a method of communication and interaction between subjects founded on the principles and dynamics of games, such as challenges, points, levels and ratings. It is aimed at stimulating the active participation and interest of users so as to reach certain predetermined objectives set by whomever employs this method. The purpose of *Gamification* is to remold the motivational axis that drives a person to take part in a given relationship or to carry out certain behavior by introducing – along with or instead of the traditional method of reward and punishment – a method founded on the interest in participating or competing in a game.

In particular, Gamification can be applied to the use of a website or the provision of a service, to improve their performance, to enhance management of clients or even to promote a new brand or consolidate trust in an already existing one, by encouraging the active participation of users. Furthermore, Gamification can be utilized by a business to improve the performance of its employees thereby stimulating efficiency and productivity through the application of the principles of games that aim at modifying employees' behavior and enhancing their skills.

In this sense, Gamification represents a practical application of the theory of behavioral economics known as 'nudge', according to which an individual decision can be oriented by means of a "push" which is determined, not by altering the set of options and choices available, but by modifying the framework in which the choice has to be made and/or the way in which the options are presented thus leading to the adoption of certain behavior rather than others.

GOVERNMENT AS A PLATFORM (GaaP)

The concept of Government as a Platform (GaaP) was introduced in the wider reflection on collaborative and participatory practices within open government models. It consists in the reorganisation of the work of government around a network of digital components and collaborative technologies, aiming at delivering better services: more efficient, accountable and safe, and responding to more variegated needs. Following a co-production logic, these components are put at the disposal of local agencies, civil servants, businesses, not for profits organisations and citizens so that they actively participate in the different phases of the service delivery cycle at a municipal, regional, national, and international level.

The "platform" is intended as an open and modular ecosystem with clear guidelines, technological tools and support services, where different actors can interact. The engagement of the citizens is bigger than in e-Government processes, since the Government becomes an enabler, rather than the first responsible, of the civic action. Through the digital platforms, it provides resources such as data, software and applications, knowledge, contents, service building blocks.

In the broader domain of the co-production of services, the GaaP can be defined as a *government-to-citizens* form of relationship between the Public Administration and the citizens or economic actors, where the Government makes its IT infrastructure available to the public helping both public officers and citizens improve their day to day productivity and decision making. At the same time, this infrastructure enables forms of *citizens-to-government* and *citizens-to-citizens* collaboration, allowing the wider public to provide information and resources to the public and among themselves.

The GaaP approach is implemented as part of wide reforms at the national level for the digitisation of the Public Administration. It is also referred to for framing co-production initiatives at other administrative scales, focused on specific sectors or policies (see: "Co-design").

The introduction of disruptive technologies, such as the Blockchain that enables new forms of disintermediated interaction between public and private actors (see: "Blockchain"), raises new questions with regard to the ICT-enabled co-production models, including the GaaP. The latter could be re-defined and widened in order to account for new functionalities, and therefore new roles of both the Administrations and the citizens as providers and/or beneficiaries of the public services. At the same time, it is necessary to design digital interactions through the platform in order to ensure the relational (and not merely transactional) exchanges and the active role of the citizens.

HORIZONTAL SUBSIDIARITY

Horizontal subsidiarity is an implementation of the broader principle of subsidiarity. In a traditional perspective subsidiarity has been conceived just in a vertical dimension. In this first sense, missions of public interest and administrative functions should be carried out by the institutional body which is closer to a local context and citizens, unless the intervention of a higher level Public Administration is found necessary (e.g. public services must be managed and provided by Municipalities, unless a specific service demands a broader organisational effort for geographic and/or economic reasons). The horizontal sense of subsidiarity is more recent and it is about the possible role of private actors (citizens, associations, NGOs, companies, and the like) in the public sphere. In particular, horizontal subsidiarity aims at overcoming the rather bureaucratic organisational models in the management and provision of welfare and public services by promoting private initiatives. Thus the implementation

of horizontal subsidiarity incentives either privatisations (with an increasing institutional role of the market and for profit private actors) or more complex public-private partnerships.

In the just mentioned meaning the subsidiarity principle is not regarded as embedded in EU primary lay, since the Treaty on European Union, Art. 5 par. 3, concerns subsidiarity solely in vertical relationships between the Union and Member States (see CJEU 24 October 2019, European Federation of Public Service Unions (EPSU) vs. European Commission, Case T–310/18).

Nevertheless, horizontal subsidiarity is often acknowledged in the European legal frameworks at the State and local levels. For instance, such a principle is explicitly proclaimed by Art. 118 par. 4 of the Italian Constitution. According to this provision, introduced in the Constitution in 2001, "by building on the subsidiarity principle the State, Regions, Metropolitan Cities, Provinces and Municipalities facilitate autonomous initiatives carried out by individual or associated citizens for the performance of activities of general interest". In a first period, the horizontal subsidiarity principle has been read as the constitutional base for massive market-oriented policies. The Italian legislator went far beyond EU Treaties provisions (see: "Co-design"; "Public Services") in fostering huge processes of privatisation in the welfare state and in considering competition as the major organisational criterion to be promoted and enforced in social and economic activities.

After 2010 the situation has changed. A more nuanced conception of horizontal subsidiarity arose, to the extent that solidarity-based direct initiatives carried out by privates started to be considered as such (see: "Active Citizens") and as an alternative to competitive and profit-based forms of management of public heritage and the welfare. This latter interpretation of horizontal subsidiarity has been increasingly successful in the Italian legal framework, and in its implementations it seems very close to those European policy directives aimed at promoting citizens' direct involvement in the co-management of common goods and public services as well as at fostering participative democracy and social cohesion at urban levels. Nevertheless it is worth making a last general remark, since the growing role of privates acting not for profit cannot result in a parallel withdrawal of Public Administrations from their functions and their duties. In this respect a sort of "non substitution principle" can be envisaged in order to empower citizens' solidarity-based contributions in the public sphere while avoiding any shrinking of public authorities' institutional responsibility.

INTERACTIVE DEMOCRACY

Interactive democracy is an umbrella term referring to a variety of approaches to make democratic processes more engaging and responsive. In this way, interactive democracy stands for a set of technologies aimed at allowing digital forms of participative and deliberative democracy. Through the provision of an open solution space with operational democratic mechanisms, interactive democracy is different from other digital infrastructures (such as social networks). In fact, interactive democracy enables digital opinion formation and it can represent a crucial innovation in the co-production of urban commons and public services, since citizens are provided with a digital democratic infrastructure for deliberation and decision making. Interactive democracy can be implemented as digital infrastructure. Broader socio-political groups can discuss and decide on many topics at the same time. At this general level, it is also worth noticing that even Public Administrations can use interactive democracy in order to make the processes of collaborative administration and of co-design as effective as possible (see: "Collaborative Administration"; "Co-design"). Among the disruptive technologies applied in the domain of interactive democracy, a major place is occupied by LiquidFeedback (https://liquidfeedback.com/). In CO3, the software is used to implement interactive democracy as one of the major features of the Augmented Commoning Areas.

LiquidFeedback is an open source software powering internet platforms operated by municipalities, political parties, social movements, associations, private organizations, and companies. The

software promotes democratic participation and self-organization. It encourages participants to develop and propose ideas and alternatives. LiquidFeedback relies on a fluid, proxy voting system that achieves scalability through the division of labor in both the voting process and the deliberation process. In the latter it is applied as a mutual debate empowerment. The choice between representation and direct engagement is individual. In this way, the software creates a hybrid system of participation that combines direct and representative democracy, referred to as liquid democracy or transitive proxy voting. LiquidFeedback gives all participants equal rights within a scalable structured discussion process in which minorities can achieve appropriate levels of visibility. Even individuals may put their proposals up for discussion. Without the need for a request commission or a moderator, the proportional representation of minorities ensures that noisy minorities don't harm other minorities in the discussion process. LiquidFeedback offers a fully transparent decision-making process. Pre-defined rules and timings ensure all process steps are made public in real-time. By ensuring that participants can verify the voting procedure which is made by recorded vote only, it enables a transparent decision-making process.

Since 2009, LiquidFeedback has been under active development by the Public Software Group and is continuously published under the permissive MIT/X11 open source license. The latest major release (version 4) has been completed in 2021. The integrated LiquidFeedback proposition development and decision making processes as well as the algorithms used are publicly described and under ongoing scientific evaluation.

LIABILITIES (ALLOCATION OF POSSIBLE)

While fostering active participation and sociability among citizens, the co-creation, co-production and co-management of commons and public services can present some specific issues about risk. In fact, the choice to facilitate open and public relationships between Public Administrations and citizens as well as among citizens means that it can be difficult to find a subject capable of effectively governing risk factors. In such situations it's arduous to find a sole and efficient risk bearer, so that in case of damages it would be problematic to apply a strict liability rule.

Public Administrations and private actors have to deal with the above-mentioned elements if they want the experiments on collaborative administration and commoning to evolve into a durable institutional framework. One possible solution is to put aside the strict liability rule and to follow the different fault liability rule. In this respect each subject engaged in collaborative administration (active citizens, Public Administrations, even occasional users) could be held liable depending on his or her fault; likewise, under a fault liability rule everyone is somehow risk bearer, so that it's possible to have no compensation for injuries that occur without the fault of the subject who is deemed to be liable. In spite of this possible interpretation, Italian experimentations on collaborative administration tend to consider the citizens that take care of urban commons as the custodians of such goods, thus applying the strict liability rule to those who are supposed to be the risk bearers in case of damages connected to commoning.

In light of the importance of promoting citizens' activation and social cohesion with reasonable legal incentives, the fault liability regime seems the preferable one. On the one hand, it is true that sometimes - e.g. when persons suffering damages do not give proof about the supposed liable's fault - injuries can lie on the victims without compensation (except for possible assurances). On the other hand, alongside such possible inconveniences it is worth noticing that the lack of strict liability is *per se* an incentive for more active behaviours, so that the fault liability rule seems much more compatible than the strict liability one with policies aimed at reinforcing and fostering direct participation as a major goal for local democracies.

NETWORK OF NEIGHBOURHOOD HOUSES (RETE DELLE CASE DEL QUARTIERE)

The Network of Neighbourhood Houses (Rete delle Case del Quartiere) is a longstanding social and institutional experimentation which has been taking place in Turin (Italy) since 2007, when a first Neighbourhood House opened. The Network is currently composed of eight Houses operating throughout different neighbourhoods in Turin. To tell the truth, attempts to provide citizens with both an overall political framework and concrete administrative measures capable of enabling their direct action became a priority for the Public Administration since the end of the last century. In those years, local decision makers observed successful policies carried out in Italy as well as throughout Europe and became convinced that a growing participation at the very local level could be considered as means of democratic renovation and social cohesion. By building on such previous experiences, the Neighbourhood Houses project constitutes a more innovative local policy.

A Neighbourhood House aims at being a cooperative and inclusive point of reference for a part of the urban territory and for the population living there, regardless of differences of age, cultural and ethnic background, social conditions and the like. Such spaces can be considered as social and cultural hubs, tending to trace diversities to a framework of social cohesion. Openness and public use are the main features of a Neighbourhood House, so that individuals and groups (associations, informal groups) can freely propose several activities and projects to be realised in a House. As a consequence, citizens tend to get increasingly involved in the collective management of the Neighbourhood House. A variety of cultural initiatives as well as mutual services takes place in a Neighbourhood House, so that these collective sites can be regarded as one among the major examples in the domain of urban commons (see: "Urban Commons"), thus demanding articulated forms of cooperative governance.

The creation itself of a Neighbourhood House can often be a positive example of urban regeneration, with renovations and requalifications of buildings and public spaces carried out thanks to the collaborative contribution of local authorities, banking foundations, social enterprises, associations and citizens. In this respect, many Houses in the municipality of Turin are eventually located in regenerated buildings (e.g. two Houses are former public washrooms).

From 2017 to 2020 the Network of Neighbourhood Houses was part of the Co-City UIA (Urban Innovative Action) project. In this context, the Network was charged with the facilitation, the engagement and the support of citizens and communities aiming at taking action for the care of urban commons. In the framework of CO3 the Network of Neighbourhood Houses has been hosting the Italian pilot site. Some disruptive technologies have been implemented in Neighbourhood Houses in order to ameliorate their democratic functioning and thus to make their management a very innovative experiment of commoning (see: "Commoning"). Liquid feedback has been used to boost transparency and openness in decision making processes. Tokens (see: "Token/Tokenization") have been created and distributed as digital awards for the contributions that individuals and associations have been offering to the overall framework of the Neighbourhood House. In particular, such tokens are supposed to be the base of a digital ecosystem characterised by circularity and cooperation. A citizen remunerated with CO3 tokens for his/her contribution to the common sphere is allowed to "spend" these tokens to access goods and services provided by the Neighbourhood House's community at large, so that exchange and sharing processes take place in innovative manners and out of a market system.

Although the covid-19 pandemic has been a major obstacle for a large experimentation (due to sanitary reasons Neighbourhood Houses have been completely closed for a long time), the development of CO3 eventually entails meaningful insights. For instance, a compromise between the limitations due to social distancing and the initial will to foster people's *phygital* presence in the ACA has been arranged with respect to the tokens exchange mechanism. In this sense, alongside

the initial system (which requires contemporary interactions between citizens and their devices through QR codes) a new method has been put in place, thus allowing citizens to exchange tokens in the Neighbourhood House ecosystem even without being in co-presence.

PUBLIC SERVICES

Public services are one of the building blocks of the welfare state, since the provision of affordable and high quality utilities is crucial for granting effective protection of the fundamental (civil and social) rights of individuals and communities. Many activities that are crucial for everyday life lie at the core of the traditional concept of public service: network services such as electricity and access to water, urban services like mobility and housing, not to mention healthcare and personal care.

In a rather traditional view, organisation and management of public services were the mission of Public Administrations, so that such activities used to be traced to a clear public framework. Particularly in continental Europe, public bodies applying specific administrative rules and procedures were charged of the effective implementation of the welfare state through a good provision of public services. Sometimes the responsibility for a service could be assigned to formally private companies, although even in such cases Public Administrations used to keep total control over companies' economic and industrial strategies.

In the last two decades of the Twentieth Century the neoliberal turn arose in Western societies and this paradigm shift entailed deep consequences in the domain of public services. Instead of keeping qualifying the whole sector of public services as the task and the responsibility of public bodies, an age of privatisations and deregulation was launched on the assumption that a competitive market was, both for Administrations and for citizens, the most adequate institutional context for the management of such economic activities. In these years open competitive procedures became the basic rule in order to find private for profit companies to be in charge of the production and provision of public services, so that market-oriented organisational criteria have become widespread even in this domain. As a consequence a new regulatory role was assigned to the State, since direct economic initiatives carried out by public bodies were deemed to be rather inefficient and bureaucratic. The major outcome of this process has been that in many European legal systems both substitutable services (e.g. personal care) and so-called natural monopolies (such as network services) have been traced to competition law and to the market as an institutional framework.

These trends have gone somehow beyond the very provisions of EU primary law, since the Treaty on the Functioning of European Union does not proclaim such a market-oriented view in the domain of public services. According to Art. 106, par. 2 of the Treaty, the sector of services of general economic interest can be traced to the rules on competition "in so far as the application of such rules does not obstruct the performance, in law or in fact, of the particular tasks assigned to them". Moreover, Protocol no. 26 on services of general interest contains some interpretative provisions relevant to Art. 14 of the Treaty. On the one hand it proclaims that "the shared values of the Union in respect of services of general economic interest (...) include in particular: - the essential role and the wide discretion of national, regional and local authorities in providing, commissioning and organising services of general economic interest as closely as possible to the needs of the users; (...) - a high level of quality, safety and affordability, equal treatment and the promotion of universal access and of user rights". On the other hand, it clarifies that Member States keep their full competence in organising and managing non-economic services of general interest.

Although some remarks about the inefficiencies of the traditional bureaucratic models were proper, the market-oriented competitive legal regime of public services proved to have some troublesome implications. Contracts between Public Administrations and private companies can be affected by strong information asymmetries in favour of the private parties. The public sector tends to lose

competences and know-hows in the long term. Affordability of some public services is not always granted.

For these reasons, in the last years a new and more nuanced view of public services as economic and social activities arose. According to this conception every subject involved in the domain of public services - Public Administrations, citizens, workers, companies - should take efforts to go beyond both bureaucratic State and competitive market, in order to experiment the new frontier of co-creation, co-management and co-production. While it's important to reaffirm the basic responsibilities of Public authorities (see: "Horizontal Subsidiarity"), this new approach to the organisation and provision of public services enhances the possibility to have shared responsibilities through cooperative and no profit governance arrangements. In this respect, the management of public services could be open to the participation of different actors pursuing convergent interests and goals, with possible positive outcomes in terms of affordability, inclusion and social cohesion (see: "Co-design").

REGENERATION

In urban systems, the word "regeneration" (also known as "renewal" or "redevelopment") alludes to a set of policies, planning strategies and legal devices that have become widespread since the end of the XXth century. Indeed, in the last 35 years many cities all around the world have been facing similar challenges, due to structural socio-economic trends emerging at a global level. For instance, many traditional industrial cities or even "company towns" (e.g. Turin, Detroit) have been forced to deal with huge processes of deindustrialisation, capable of upsetting former urban identities and of creating large urban voids within the so-called industrial heritage (see: "Urban voids"). Conversely, relocation of industrial productions has often been a major input for unprecedented strategies of renewal in those urban systems chosen by multinational companies to host new factories. From a second perspective Western cities, especially in Europe, have been facing crucial issues such as the one of ageing population (e.g. the current average age in Italy is 45). Broader challenges come from huge demographic trends. At a quantitative level, decreases in urban populations have not been so rare: as a consequence, in many towns parts of the urban system (public spaces, commercial buildings, dwellings) have partially or totally lost their function, by becoming underused or even abandoned with predictable negative externalities. At a qualitative level, migrations and increasing flows of "city users" have often modified urban populations' composition, with unprecedented complexities like those connected to the welfare and the provision of public services, not to mention the serious problems of xenophobia and of spatial and ethnic segregations.

Urban regeneration has emerged as one of the major strategies to deal with such a delicate framework. In general terms, regeneration projects aim at providing specific urban sites (e.g. abandoned plants, old docks, unused public buildings) or broader neighborhoods with a new aesthetic and functional identity. Renewals can be "intensive" or rather "conservative": according to the first approach, large demolitions can be carried out and followed by the construction of totally new buildings and complexes; in the latter case, the development of the project consists in more attentive restorations of buildings and urban areas (so that, for instance, whole demolitions do not occur).

Although generally associated with major policy priorities such as environmental sustainability, energy efficiency and social cohesion, as well as to the overall discourse on "smart cities", urban regeneration is not neutral with respect to its possible distributive effects. Large debates about the connection between regeneration and gentrification highlight that delicate socio-economic and legal issues can be noticed beyond the rather rhetorical aspects of this topic. First, the goal of social cohesion could be put aside by the distributive impact of a regeneration initiative: for instance, long-term inhabitants of a regenerated neighborhood can be forced to move away because of the

increasing costs of living (e.g. tenancy). Moreover, from a legal perspective one can ask whether and to what extent public authorities keep their institutional margin of political decision on urban planning, in those cases characterised by renewal projects promoted by private developers (namely, private real estate companies) and regulated through quasi-contractual agreements between privates and Public Administrations.

Apart from such critical findings, one can highlight that forms of urban regeneration based on participative cooperation and aimed at recovering and fulfilling social cohesion are an increasing reality throughout Europe. In this respect, a meaningful social dimension is becoming a pillar of the debates on regeneration, so that the role of active citizens and local communities have arisen alongside more traditional and powerful institutions (public authorities, private companies, universities). Current regeneration policies tend to facilitate people's empowerment and local communities' agency to the greatest extent. Sometimes, like in the Italian local legal framework, some experimentations eventually became a well-acknowledged model of regulation (see: "Regulations on the co-management of urban commons").

The CO3 project is a clear example of such efforts, thanks to its attempt to combine the innovative implementation of some disruptive technologies with the best practices and legal arrangements in the field of co-design and co-management of public services and urban commons.

REGULATIONS ON THE CO-MANAGEMENT OF URBAN COMMONS

Regulations on the co-management of urban commons are local administrative acts that have become widespread in Italy since 2014, when the first Regulation was adopted in the city of Bologna. These Regulations have proved to be a successful legal model: they are currently in force in more than 200 Italian municipalities; they have attracted much interest at the European and comparative levels as well.

Such acts provide municipalities and public institutions, private actors (owners, companies) and active citizens with a legal framework for the fulfillment of collaborative administration (see: "Collaborative administration"). Regulations usually contain a set of definitions and principles relevant to the law of urban commons. Among these provisions it is worth noticing the wide scope of the concept of active citizens - whoever can take action, regardless of age and nationality (see: "Active citizens") - and the role of principles such as informality (in the relationships concerning urban commons rather bureaucratic formalities should be avoided, unless they are mandatory) and civic agency (one of the major aims of these innovative experimentations is to allow citizens' empowerment as much as possible).

Procedures leading to the signature of agreements between Public Administrations and active citizens are regulated too. Initiative can be up to the public sector, with open calls inviting individuals, associations and informal groups to take action with respect to certain goods that are supposed to be urban commons by the municipality. In principle, active citizens can take initiative as well, by assessing that a part of the city (e.g. a park or an empty building) should be regarded as urban commons and by proposing a collaboration draft. To comply with the general principle of transparency, such proposals and drafts are usually published in the online channels of the Public Administrations.

After these first steps, open and transparent negotiations take place between the parties to the future agreement; of course, participation of every other stakeholder is welcome. Regulations contain some rules on this topic: due to the principle of legality specific provisions regard public authorities' decisions (e.g. when and whether public managers are entitled to conclude agreements, and when and whether a decision of political bodies is necessary), whereas the very negotiations are rather informal. That said, the general aim of this phase is to reach a cooperative definition of the rules and the tasks for the inclusive governance of the urban commons (see: "co-design").

Most Regulations focus on a specific quasi-contractual agreement between Public Administrations and active citizens, namely the collaboration pact. The parties to such a pact organise the cooperative governance of urban commons by sharing responsibilities of care and management (see: "Collaboration pact"). Although collaboration pacts are very flexible legal tools, of course other institutional solutions can be possible for an effective governance of urban commons. For instance, the model of urban civic and collective uses (arising from the experimentation carried out in Naples) seems capable of providing active citizens and communities of reference with a broader margin of agency towards urban commons, so that Public Administrations share less responsibility in their governance. Moreover, very complex urban commons could be governed through the creation of a participatory Foundation (this tool is regulated by the recent Regulation of Turin no. 391). Such a legal entity could also become the formal owner of the urban commons, characterising a model of property based on stewardship, inclusion, long-term collective governance in the interests of the urban environment and of future generations.

Last, Regulations deal with possible difficulties in the co-management of urban commons. In this respect, there are always provisions about the allocation of possible liabilities, whereas rules about risks prevention could be better defined in order to avoid excessive disincentives for the actors involved in the co-management of commons (See: "Liabilities, Allocation of Possible -"). Default rules fostering cooperative disputes resolution are also provided. This choice is coherent with the whole view of urban commons and of collaborative administration. It is also remarkable since it contributes to fostering a general turn in the mentalities of public authorities and citizens as well as in the institutional functioning of their relationships.

TOKEN / TOKENIZATION

Tokens are digital representations of assets, which confer on their holders a utility or entitlement to be exploited for investment purposes or to be used as a means of exchange. The socio-economic transformations associated with the digitalization of markets and the development of blockchain disruptive technology have assigned to the concept of token the new role of defining how economic value can be represented and distributed in the digital realm.

In the context of blockchain, tokenization is implemented through use of smart contracts that represent an asset that exists apart from a blockchain and embeds it as a tradable token on the blockchain itself. The native blockchain-based assets are usually defined as crypto-assets or coins whereas the non-native blockchain tokens are generally referred to as tokenized assets (or digital tokens).

From a functional point of view, tokens may be subdivided into three categories.

Currency tokens are used as a means of payment primarily within the system in which they were OLA ha iniziato a fare degli incontri con utenti su questo tema (il loro scenario 2). Possiamo chiedere a loro quale sia l'impostazione che stanno dando, quali soggetti stanno coinvolgendo e quali siano i primi riscontri.created (e.g. Bitcoin). Although not issued by central banks or national authorities these tokens acquire value directly from the law of supply and demand and are guaranteed by the whole community of blockchain users.

Utility tokens are assets which are usually issued to fund the development of the cryptocurrency and to guarantee the holder's right to make use of a product or service offered by the issuer. Utility tokens comprise the largest and most well-regarded Initial Coin Offers (ICOs).

Security tokens are used to confer on their holders the right to participate in a share of the future profits of a company and to take part in the exercising of the administrative function of the same. Despite the numerous functions which can be assigned to tokens, their use poses many legal issues

with respect to their regulation as well as risks related to how tokens remain linked to real assets and to the ever-present online risk of their being objects of hacking.

URBAN COMMONS

The commons are one of the major institutions in contemporary legal thought and in social sciences. Although the huge number of theoretical contributions as well as practical experimentations discourage the adoption of general and stable definitions in this field, according to the influential work of an Italian commission chaired by Prof. Stefano Rodotà commons can be regarded as those corporeal and immaterial "things capable of generating utilities which are relevant to the exercise of fundamental rights and to human flourishing". Due to such a functional and legal relevance, commons can be considered as the objects of collective and inclusive property rights, that is legal entitlements capable of challenging the individualistic and exclusive conception of subjective rights at the core of Western legal tradition. While suggesting deeply renovated views of property as a crucial legal institution, these resources should be "protected by the whole legal framework, even in the interests of future generations". Each and every member of the communities of reference should be entitled to take care of commons: in this respect, a collective legal standing concerning remedies having a precautionary potential (e.g. injunctions) has been envisaged and sometimes experimented.

At a general level, a thorough understanding of commons depends on the insights offered by economic analysis of law. For instance, the idea that exclusive property rights are the most suitable legal institution for the overall governance (enjoyment, exchange, reproduction) of scarce resources is connected to the so-called "tragedy of commons". According to this metaphor (which is the title of a crucial article published by G. Hardin in 1968), where a limited resource is held in common and without constraints (such as effective prerogatives of exclusion) every member of the community will tend to use such a resource in order to maximise his/her individual utilities. As a consequence, according to this view in most cases the tragic destiny of commons can be overconsumption and depletion. From another perspective, critical remarks about the development of individualistic private property have been made by highlighting the scenario called the "tragedy of anti-commons". According to influential researches carried out by M. Heller in the last Nineties, excessive fragmentations of individual property rights tend to prevent efficient forms of governance of a given resource, because the proliferation of exclusive legal entitlements can result in many concurrent powers of veto and in disincentives for cooperative behaviours.

Such insights allow to underline that the efficient and sustainable governance of scarce resources cannot be granted by a priori legal arrangements, based on the allocation of exclusive property rights. On the contrary, as the Nobel Prize E. Ostrom has shown in her landmark works sophisticated forms of collective governance can be compatible with the construction of limited resources as commons. In this view, the identification of some design principles (such as the clear definition of group boundaries, and the necessity that the subjects affected by some rules can take part in changing the rules) is able to lead to an efficient governance of some resources, although the institutional framework organising the life of a community is neither the market nor private property.

In the last decade urban contexts have become one of the major laboratories for the emergence of commons as a legal institution. The reasons for this process are rather intuitive. While the development and the many transformations of cities have always been about the collective dimension of human life - since cities are probably the most ancient among the complex artifacts created by human communities -, unfortunately in the last fifty years urban systems have proved to be increasingly incapable of providing people with widespread social security. The increasing difficulty to grant social cohesion and a high quality public sphere is connected to broader structural changes in Western societies as well (see: "Active Citizens"; "Regeneration"). In this framework, the

discovery (or the reevaluation) of urban commons can also be seen as a reaction to some huge processes of (explicit and soft) privatisation of public space. Many parts of a city can assume the legal qualification of urban commons: a square, an underused garden, an abandoned building can become urban commons, so that citizens can take action and care of these goods through diverse forms of collective governance in the interest both of the community at large and of future generations.

In fact, the effective care of urban commons demands some direct activation of the members of a local community, so that citizens are brought to invest in democratic cooperation, thus reinforcing mutual trust (in the community and in public institutions) and social cohesion. Moreover, the successful governance of commons in urban systems means that collaborative relationships between Public Administrations and active citizens (see: "Collaboration Pact") can be able to provide a local community at large with affordable and innovative access to shared goods and public services.

In this respect, the increasing success of several experimentations in the field of urban commons shows that another influential scholar, C.M. Rose, was right when she proposed the metaphor of the "comedy of commons" in response to Hardin's argument. In fact, enabling the collective care and the collaborative management of commons in urban systems means that administrative policies and legal experimentations aim at fostering the potential of commons in terms of sociability. Therefore, even at the urban level (and maybe mostly at this level, which is closer to the people and easier to deal with) commons can be appreciated as an institutional base for developing inclusion and solidarity, intergenerational fairness, social cohesion and participative democracy.

URBAN MODELLING

In urbanism, urban modelling is one of the major and most established approaches to deal with the processes of structural transformation within urban systems. In brief, through urban modelling decision makers can obtain simplified abstractions of a certain urban reality, so that they can build on such models in order to predict future trends and to arrange consequent measures in terms of urban planning and administrative policies. For instance, where urban modelling foresees the expansion of a certain neighbourhood, future needs for housing can be envisaged and localised, and investments in the sector of network services can be programmed as well. Likewise, where urban modelling highlights a trend toward the concentration of economic activities in a specific area of a city, the need for larger investments in transportation (or in other social infrastructures such as kindergartens) can be taken into account and involve that part of the urban system.

Urban modelling techniques have been evolving in their own methodologies and functioning. In a first phase, static and somehow deterministic views were dominant: these approaches could be traced to the overall traditional conceptions of urbanism, based on clear-cut functional spatializations of urban territories, on precise (and rather simplistic) models of human rationality and on a major role of local public authorities. On the contrary, during the last decades a different awareness arose, so that dynamic views have become a widespread reality in urbanism by enhancing multi-functional conceptions of urban development, more nuanced views of the rationality at the base of human flows, and the possibility of partnerships between Public Administrations and private actors. Alongside these changes, technological innovations have been a major stimulus for the evolution of the entire domain of urban modelling by creating unprecedented possibilities of collecting data and elaborating predictions.

In light of such remarks, it is easy to notice that nowadays urban modelling is becoming more and more complex. This trend is connected with the ongoing complexification of urban planning and social sciences from a theoretical perspective. In contemporary urban contexts modelling is an

actual challenge, since it is currently clear that cities are recursive systems characterised by mutual influences between human actions and flows and the infrastructures provided by law, urbanism, technology. Such a complexification depends on material issues as well. In fact, the growth of cities in terms of population and their increasing complexity in terms of demographic composition are at the base of major issues, such as the environmental (e.g. risk of depletion of ecological resources within an urban system) and social (e.g. growing inequalities, saturation and/or privatisation of public spaces, and the like) ones. In this respect the models need to become more sophisticated, even through the adoption of innovative legal arrangements, social methodologies and technological tools.

CO3 has been trying to deal with some of the above-mentioned challenges through the interaction between a tactical recourse to urban modelling techniques and the implementation of disruptive technologies. By building on a small scale, the basic aim in the development of CO3 has been to somehow democratise urban modelling, since the use of disruptive technologies such as augmented reality and interactive democracy can make these processes more participatory. In particular, within the Paris 2 scenario the Consortium has experimented a particular articulation between non-professional and professional urban modelling tools with CO3 technologies. The Institut de Recherche et d'Innovation (IRI) developed *ad hoc* a Minetest server (the open version of the Minecraft games) for centralizing the different contributions made by young students with the help of their professors and local experts who intervene – coordinated by IRI – within ten schools situated in Plaine Commune, the northern suburbs of Paris. The main idea was to redesign parts of their schools or of their city through the game Minetest, then export the entity created as 3D models and import them in the CO3 app. CO3 technologies, particularly the Augmented Reality and the geolocated social network FirstLife, have been really appreciated by both students and professors. In this respect, the consortium has witnessed the fact that even non-professional urban modelling technologies could become a tool that can be traced to the broader domain of co-creation, co-production and co-management of urban commons and public services if well designed and integrated in a technological and social milieux..

URBAN VOIDS

From a general perspective, one can define as urban voids all those spaces in the cities characterised by abandon, underuse, loss of a former functional identity (as well as lack of a future one). Urban voids are one of the major issues in contemporary urbanism because of some structural socio-economic trends recurring in most Western urban systems. First, deindustrialisation processes have led many companies to restructure and/or relocate their businesses, thus to abandon factories and large industrial complexes. Such choices have often created gigantic urban voids and caused huge shocks for the functional equilibrium of a neighbourhood or even for the entire urban identity and economic stability of a city. Moreover, demographic trends are bringing many Western cities to face widespread challenges, such as ageing population, as well as unprecedented mixes in terms of socio-cultural composition and of language diversity. In some cities another outcome of demographic trends is the decrease in urban population, which can imply the creation of urban voids in the stock of residential dwellings. More recently, the Covid-19 pandemic has been the cause of the possible emergence of new urban voids, since the rise of flexible and smart working could determine a fall in demand for offices and commercial real estate in the city centres.

The issue of urban voids can be addressed from multiple perspectives. If some urban voids are not part of the built environment, a possible choice could be to let such spaces to their spontaneous development, this policy meaning not a lack of interest but, on the contrary, the awareness of the

positive environmental role of spontaneous natural ecosystems within a broader urban context. Of course, even empty buildings, such as the industrial heritage, pose environmental issues. For instance, a former factory can be converted into other valuable uses only after decontamination, so that this element is one of the key challenges in the domain of urban regeneration (see: "Regeneration").

Environmental aspects can be traced to the broader discussion on the side effects of urban voids. In this respect, it is worth noticing that urban voids tend to generate negative externalities even at a social level. Empty dwellings can represent a distortion of the market of residential property. They also create incentives for occupations carried out by persons in need, and thus lead to the emergence of many delicate issues related to the social treatment and to the legal regime of squatting. At large, urban voids in the built environment are often the cause of negative side effects in terms of urban quality (abandoned buildings tend to determine a fall both in economic values and in the quality of life in the involved neighbourhood) and security (unlawful and/or dangerous activities can take place in such empty buildings).

In the framework of CO3 the issue of urban voids has been addressed by foreseeing the possible interactions between disruptive technologies and the democratic decision making process about the future uses of such spaces. As one of the scenarios experimented in the Athens pilot shows, through technological strategies combining Augmented Reality (see: "Augmented Reality") with gamification (see: "Gamification") citizens can be enabled to isolate specific urban voids within a certain Augmented Commoning Area, so that "digital proposals" can be made for possible new collective uses of these abandoned pieces of neighbourhoods. The interplay between the traditional legal regime of empty buildings (on the one hand) and the possible legal acknowledgment of digital proposals made by citizens (on the other hand) is an open question, however the emergence itself of such a topic is the proof of the innovative potential of the implementation of disruptive technologies in the domains of collaborative administration and urban governance.