

Collective architecture? Reflections on collective designing and collective construction based on ethnographic observations of an Arquitecturas Colectivas' construction site

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EXPLORING NEW CO-PRODUCTIVE PATHS IN DESIGN-DRIVEN INNOVATION

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Co-production and creative economies

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In urban contexts, what has been called ‘maker culture’ has recently given birth to a collaborative ecosystem of innovation made up of institutions, enterprises, universities, creative professionals, citizens and associations. This trend has engendered an urban community of innovators who are active in many fields and an array of collaborative spaces which are hybrid in nature, such as co-working spaces, fab labs, incubators, and creative centers. This is a distributed system of hyperlocal ‘incubators of experiences’ that generate what can be considered a new creative class. This paper compares the two cases of maker culture in the cultural industry addressed by the other essays in this book, namely collective architecture and fab labs operating in the field of fashion. Through comparison, some key issues of the new trend become manifest.

Keywords: citizen-centric innovation, maker culture of production, new creative class, city, creative industries, architecture, fashion.

Introduction

Something is changing in industry. The traditional landscape of factories, processes and actors is being progressively transformed, creating an opportunity for new socioeconomic, organizational and technological models of innovation to arise, namely, what has been termed the maker culture of production.

The city has once again taken center stage. As during the first industrial revolution, metropolitan areas have become agents of social change and development by bringing together demand and supply: demand for product-services, technologies and infrastructure, economic, political and organizational resources, environmental knowledge, physical spaces, and supply of individual and collective competences and skills, research facilities (private and public entrepreneurship, universities, labs and research

institutions) and the infrastructure of production and distribution that enables everyday city life.

The city itself is also a vast market for innovation made up of both public and private actors deeply rooted within its physical and social structure. Such a market may benefit from an innovative, distributed system of production, embedded within city systems, supplementing the existing one. It may be possible to nurture a new idea of manufacturing as a public-private 'alliance' and cross-disciplinary development model that emerges from a consideration of certain critical societal challenges such as local or regional development models, new forms of work and employment, the circular economy and sustainability, future urban growth, and production-consumption models.

Thanks to its own positive energy – including creative ignorance and naivety (Formica 2015; Dougherty and Conrad 2016) – and social engagement, the maker culture has spawned an ecosystem of institutions, enterprises, universities, creative professionals, citizens and associations, setting the stage for a more collaborative context. This trend generates a vibrant urban community of innovators who are active in a variety of fields: social, economic, technological, creative and cultural. In short, a community of converging communities. It includes a community of design innovators: designers and other creative industry professionals and their agencies, schools and universities, artisans and companies evolving from the 'traditional' fields of fashion, design and communication. It includes a community of social innovators (Barbera and Parisi 2019): policymakers, sociologists, economists, associations, bodies and institutions that develop services or social enterprises on an urban scale. Finally, it includes a community of technological innovators: engineers, researchers, scientists, start-ups, makers, fab labs, hi-tech and med-tech companies developing ICT technologies, advanced manufacturing technologies, nanotech and biotech.

Beside these agents are citizens with the capacity to organize themselves as independent innovators. They actively participate in the co-design and co-production of goods and services, adopting a clear sharing economy perspective and displaying a growing sensitivity to issues of social and environmental sustainability and therefore the circular economy. This urban community aggregates in an array of hybrid (multidisciplinary, social, experimental) collaborative spaces, such as co-working spaces, fab labs and maker spaces, incubators and business accelerators, cultural and creative centers.

Such experiments have reinforced and empowered the established system of public and private institutions, enterprises, universities and research centers. A series of urban policies have also supported the birth of new communities of innovators while reinforcing the social, economic, technological, and cultural milieu through the creation of spaces for digital fabrication (maker spaces, fab labs, co-working spaces) and the rise of awareness and networking.

The city might be considered an open city-laboratory that fit into a Fab City perspective¹: a connected ecosystem capable of conceiving, developing, and materializing new product-services in high-value production chains (agro-food, fashion, digital transformation and communication, healthcare and med-tech). Some municipalities (e.g. Amsterdam, Barcelona, Milan and Paris) have developed policies to provide incentives for the development of a distributed digital manufacturing infrastructure – made up of fab labs, maker spaces, co-working spaces and startup incubators – to support experimental research projects on innovation models and pilot projects on an urban scale, and for developing young people’s individual digital skills.

The role of technology has branched out accordingly, becoming: a) an enabler of collaboration processes and structural changes in the organizations devoted to production or service delivery; b) a tool for restructuring roles and practices in the process of materialization from the idea to the artefact; c) a component (thanks to the overwhelming digital data) of imagination and decision processes; d) the object of design processes that increasingly consider interaction a significant aspect of the product’s imagined performance.

This change is happening as part of a sociotechnical mix in which the principles of the collaborative economy and co-design are profoundly influencing traditional design processes, especially in sectors such as healthcare, food, transportation, and fashion. New kinds of innovation spaces – such as maker spaces (Herrmann and Büching 2013), living labs (Keyson et al. 2017) and experience labs (Raman et al. 2017) – are proliferating, promising a future in which co-design and co-production practices are increasingly part of the innovation framework in advanced socioeconomic contexts (Reznick 2016).

This general framework contains favorable conditions for the rise of a distributed system of hyperlocal ‘incubators of experiences’ which generate

¹ See the *Fab City Manifesto*, Mairie de Paris, <https://fab.city/uploads/Manifesto.pdf>. Accessed 6 April 2019.

what can be defined a new ‘creative class’ (Florida 2002) operating in and for new urban creative scenes that include the suburbs (Florida 2017)². At the beginning of this century, this emerging digitally and socially augmented creative class is destined to create and spread a new culture of innovation that can collect and integrate the most significant aspects of the socio-technical and environmental transitions. Indeed, the ideas that characterize this new creative class – such as collaboration, openness, connection and democratization of access to technology – form a civil utopia that distances itself from the techno-deterministic paradigms of Industry 4.0 or smart cities (Brynjolfsson and McAfee 2014; Schwab 2017; Bria and Morozov 2018). In the new creative scene, it seems possible to revive the ability to challenge inherited models of development, the idea of human power and design agency and the purposes and meanings of productive acts (Anderson 2012; Rifkin 2014; Mason 2016; Srnicek and Williams 2015).

Two cases for a discussion

The present volume brings together two contributions to the discussion that explore the transformations that co-production processes have brought about in important areas of design such as architecture and fashion. The first (‘Collective architecture?’), by Alvisio Mattozzi and Fabio Maximilian Franz, examines in detail the role of the architect in the context of co-production of a building. The second (‘User and design innovation in fashion practices within urban collaborative spaces’), by Chiara Di Lodovico, analyzes the role of fab labs as places of co-production and digital fabrication in the context of the fashion system. Both texts elaborate on talks given by the authors at the seventh STS Italia conference (‘Technoscience from Below’), held in Padua, Italy, from 14-16 June 2018. Thus, they are further developments of a discussion that flourished on the basis of these and other papers presented at the conference track ‘From grassroots to citizen-centric innovation: the collective design of emerging innovation ecosystems’ that we convened.

The two studies that we have collected in this book are different in several ways. First, and most obviously, they deal with two different and largely non-communicating areas of design, such as architecture and

² Richard Florida has recently self-criticized his previous work on the ‘creative class’, highlighting that in many cities the rise of the creative class created economic growth only for wealthy people, displacing the working class in the suburbs.

fashion. Despite the existence of fashion designers who are also architects, or of design approaches that exploit the two metaphorical spaces constituted by the architecture of garments and the cladding of buildings, they are actually two quite distinct worlds. They diverge with respect to the characteristics of the designed artefacts, the underlying economic and productive processes, prevailing professional practices, and because they are distinct social networks that intersect only in the design of flagship stores and art foundations.

Secondly, the two studies address two opposite aspects of the design field. The next paper deals with the issue of citizen-centric innovation applied to the manipulation of public spaces, managed by the public body and experienced by the community as a whole. The 'civic' character of co-production does not concern only the production process open to the collaboration of anyone armed with good will (including the passer-by, in principle). It also affects the final product, which is an artefact that modifies a public space and therefore influences community life – a community which nevertheless only partially coincides with the community that co-produced it. In the last paper, on the other hand, the same topic is applied to fashion, that is, to a design field based on private, individualistic consumption, albeit one which is subject – as is known – to the norms of social homologation and distinction. While in the first case one of the key issues is the relationship between the various 'publics' that interact and conflict around the artefact, in the second case it is the relationship between collective activity and individual motivation, which indeed constitutes an element of fragility in the diffusion of forms of citizen-centric innovation in the field of production as well as in the field of consumption – which in fashion are just two sides of the same coin, as observed by Entwistle and Slater (2012).

Finally, the two papers also differ in terms of technologies. The first presents a case of co-production entirely based on analog technologies and on the manual, largely unskilled activities of participants. The second, on the other hand, digs into the world of fab labs, which are among the most common and established expressions of the new digital manufacturing movement. Not only is the use of new technologies an element that was originally constitutive of digital fabrication, but the combination of high-level (creative, managerial and IT) specialisms is in fact an essential key to the functioning and success of maker spaces. This means that the dynamics exhibited by the two cases, evidently permeated by in-situ technology, are very different in character and apply to different social frameworks.

These differences make the two cases in a certain sense mutually complementary and allow a wider understanding that only a stereoscopic vision can offer. Forms of co-production do not arise in a social void, but expand on existing economic models, institutional frameworks, practices, situations and professional cultures. It is from these relationships that they take on their shape and direction of development. Thus, for example, interaction with public administrators with regard to transformation of a public space takes place through a steady negotiation of the limits of legality and the concept of community. On the contrary, fashion co-production in a fab lab is usually conceived as an instrument that can renew the creation and production of clothing without calling into question the legitimacy of industrial production and the market. Accordingly, the two cases are representative of two opposite poles of potential development for the collaborative economy (Greenfield 2017).

Mattozzi and Franz also make it clear how, in the case which they examined, a set of people's acquired skills, technical constraints, goals, and traces of organizational forms produced the structuring of hierarchies and access barriers, even in a co-production site that is strongly shaped by ideological considerations. (Reading their description, one has the impression that the realization of the artefact is functional to the experience of collaborative architecture at least as much as co-production is functional to the realization of that particular building.) This raises two interesting issues for research into co-production. On the one hand, it needs to understand how hierarchies are formed, what makes them stronger or weaker, how they bypass the very spirit of co-production and contradict the original logic of the activity in question. On the other hand, it must seek to understand how these dynamics can be taken into account in pursuing co-design and co-production objectives in order to avoid the risk that the contribution of each be subjected to and limited by access barriers imposed by others.

Another crucial issue on which Mattozzi and Franz's study focuses, albeit in a different direction, is that of the architect's authorship. The observation of a case of non-traditional architecture reveals how the architect's authorship goes far beyond the design phase and recognized design tools (such as concepts, designs, blueprints, etc.). To begin with, the architect's authorship is substantially exercised in the management of social relations. Specifically, it is exercised both in negotiations with stakeholders (mainly public commissioning bodies) and the management of the construction site and coordination of all those who, de facto, contribute in various ways to

the construction of the building. Moreover, authorship is accomplished not only in the production of an artefact of which the architect is the only one who can be considered fully responsible, but also in the creation or validation of a new collective architectural process which is capable of educating people to re-appropriate public spaces by exploiting their own resources. Considered in these terms, the architect's authorship is not only the fruit of the specialist's technical expertise but is also a form of 'cultural' authorship that is typical of cultural intermediaries (Bourdieu 1979), that is, of those who mediate tastes, collective norms and values through their own work, thus actively contributing to the continuous transformation of the cultural landscape of society.

Considering the economy of co-production from the perspective of fashion allows Di Lodovico to reveal an undeveloped potential that needs to be kept under observation for years to come. Notoriously, fashion is a strongly hierarchical industry and social sphere, based on the distinction of a production and consumption elite that anticipates the choices of the consumer masses (prone to homologation). It is therefore not surprising that the fashion system has long been kept away from concepts such as co-design, co-production, and participatory economy. However, the phenomenon of participatory design-driven production is beginning to pervade the textile and clothing sector too, for now in embryonic and experimental forms, whose future is yet to be discovered and investigated. The premise of Di Lodovico's is that more extensive use of fab labs and digital fabrication in the textile and clothing sector would lead to a gradual transformation of a number of essential aspects of fashion, and to its effective democratization. The author does not hide – from herself or us – the barriers encountered by the sharing economy in the attempt to gain access to the fashion system, which is strongly based on brand identity, individual creative performances and protection of specific know-how on the part of SMEs and has not yet worked out what to do with the culture and practices of the maker movement. Yet to for the players in this field interviewed by Di Lodovico it is very clear that the force of change represented by fab labs lies not so much in digital manufacturing technologies as in the human factor that they bring to the field. Particularly, it resides in its two main (and complementary) aspects: the strength of the community as a multiplication of individual resources which are not trapped within rigid organizational forms, and the cross-fertilization that it enables between specialized professionals who in traditional companies rarely have the chance to work together.

Conclusions

The experience of collective architecture described by Mattozzi and Franz and the relevance of fab labs to the textile and clothing sector and fashion in particular as investigated by Di Lodovico, are useful for testing the scope and limits of the maker culture, as they show it 'in action', i.e. applied to actual professional practices within the cultural industry, highlighting the context of constraints and potentialities within which the maker culture can and must establish itself. They also show the heterogeneous community of agents that supports, and is required by, the actualization of a maker culture.

The growth of this extraordinary milieu, based on new ideas, values and experiences and not only on traditional production modes based on a market economy, engenders a new creative class. It is precisely this new creative class that can channel a new maker culture of production capable of extending the landscape of urban transformation in a broader, more collaborative way and proactively challenge those systems of commodity and value production that replicate the traditional culture of industrial capitalism.

References

- Anderson, C. (2012) *Makers: The New Industrial Revolution*. New York: Crown Business.
- Barbera, F. and Parisi, T. (2019) *Innovatori sociali. La sindrome di Prometeo nell'Italia che cambia*. Bologna: il Mulino.
- Bourdieu, P. (1979) *La distinction. Critique sociale du jugement*. Paris : Les Editions de Minuit
- Bria, F. and Morozov, E. (2018) *Rethinking the Smart City: Democratizing Urban Technology*. New York: Rosa Luxemburg Stiftung.
- Brynjolfsson, E. and McAfee, A. (2014) *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*. New York and London: W.W. Norton & Co.
- Dougherty, D. and Conrad, A. (2016) *Free to Make: How the Maker Movement Is Changing Our Schools, Our Jobs, and Our Minds*. Berkeley: North Atlantic Books.

- Entwistle, J. and Slater, D. (2012) Models as Brands: Critical Thinking about Bodies and Images. In J. Entwistle and E. Wissinger (eds) *Fashioning Models: Image, Text and Industry*. London and New York: Berg, pp. 15-33.
- Florida, R. (2002) *The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community and Everyday Life*. New York: Basic Books.
- Florida, R. (2017) *The New Urban Crisis: How Our Cities Are Increasing Inequality, Deepening Segregation, and Failing the Middle Class – and What We Can Do About It*. New York: Basic Books.
- Formica, P. (2015) *The Role of Creative Ignorance: Portraits of Path Finders and Path Creators*. New York: Palgrave Macmillan.
- Greenfield, A. (2017) *Radical Technologies. The Design of Everyday Life*. New York: Verso.
- Herrmann, J.W. and Büching, C. (eds) (2013) *FabLab: Of Machines, Makers, and Inventors*. Bielefeld: Transcript-Verlag.
- Keyson, D.V., Guerra-Santin, O. and Lockton, D. (2017) *Living Labs. Design and Assessment of Sustainable Living*. New York: Springer.
- Mason, P. (2015) *PostCapitalism: A Guide to our Future*. London: Allen Lane.
- Raman, S., French, T. and Tulloch, A. (2017) Design-led Approach to Co-production of Values for Collective Decision-Making. *The Design Journal* 20 (sup1): S4331-S4342.
- Reznick, E. (2016) *Developing Citizen Designers*. New York and London: Bloomsbury.
- Rifkin, J. (2014) *The Zero Marginal Cost Society: The Internet of Things, the Collaborative Commons, and the Eclipse of Capitalism*. New York: Palgrave Macmillan.
- Schwab, K. (2017) *The Fourth Industrial Revolution*. London: Penguin.
- Srnicek, N. and Williams, A. (2015) *Inventing the Future: Postcapitalism and a World without Work*. New York: Verso.

Collective architecture? Reflections on collective designing and collective construction based on ethnographic observations of an Arquitecturas Colectivas' construction site

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Thanks to some vignettes coming from ethnographic observations of a collective architecture construction site, the present paper proposes few tentative reflections on the role of design and designers within new collective-based forms of production.

Keywords: *construction site, collective architecture, design, ethnography, translation.*

Introduction

We intend to present a specific case study of collective architecture, which we have observed by a short participation in it.

By describing our specific case, we will address two issues that we consider key for discussing co-design and co-production: the role, in these processes, of

- designers

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The present paper has been researched, conceived and drafted by both authors together. For practical reasons, Alvise Mattozzi wrote paragraphs 'Some tentative reflections' and 'Conclusions', whereas Fabio Maximilian Franz wrote paragraphs 'Introduction' and 'Ethnographic vignettes'.

- (architectural) designs, taking usually place through blueprints, but that can also take place through sketches, renderings, and other kinds of visualizations, which in our case were missing (at least from the construction site).

The ethnographic observations that gave way to our ethnographic vignettes on which our reflection is based were gathered while carrying out a research on eco-social design practices¹.

One of the practices we have researched upon is a Spanish architectural studio, which, as a member and as a propeller of the Arquitecturas Colectivas network, engages in ‘guerrilla architecture’, in order to allow citizens to reclaim and live the public space, especially by rearticulating it, through construction practices. The Arquitecturas Colectivas network works through two Internet sites: the site of the network (<https://arquitecturascolectivas.net>), and the site of GRRR - Gestión para la reutilización y redistribución de recursos (<https://www.grrr.tools>), where exchange of recovered construction materials among the network’s construction sites takes place.

As we have done with the other seven practices considered in our research, we not only ran a long narrative interview with one of the architect of the studio, but we also managed to spend some time with him and his associate and collaborators, observing their everyday life.

It is so that, quite unexpectedly, we found ourselves on a Saturday of April 2017 on the construction site of an autonomous community center in a town in the hinterland of a major Spanish metropolis. The community center being built was supposed to replace another autonomous community center located in a century old cultural multipurpose center (with a theater, a dancehall, a terrace for open-air events). The multipurpose center had been abandoned and then squatted and now was going to be demolished in order to make room for a city council project.

The new autonomous public center was going to be built just besides the old cultural multipurpose center, recovering some of the side buildings. It comprised a new two-story building – the one on which we worked – designed to be, besides the seat of the collective running the community

¹ The research, funded by the Free University of Bozen-Bolzano, has as a title *Mapping Eco-Social Design*. It intends to map and describe the ‘economies’ of eight European practices working in the field of eco-social design, which manage to make a living out of their design projects. The research group consists, besides of the two of us, of Kris Krois – the Principal Investigator – of Free University of Bozen-Bolzano and Bianca Elzenbaumer of Leeds College of Art.

center and a place for meetings, also a watch tower on the renovation works.

Out of a negotiation with the squatters and within a framework of participatory architecture, which has lately characterized urban policies of the Spanish area, where the project was taking place, the city council approved to fund a participatory path that led to the construction we took part in building. The architectural studio we were researching on entered into the project only at a second stage. As any other architectural studio, the studio we observed asks for a fee proportionate to the costs of the construction, when dealing with public administration. Construction costs are lower than usual, not only because of the use of recycled materials, but also because construction does not employ paid employees, given that construction works, except for some technical features, which can require expert interventions, will be carried out by those living and using the building. Indeed, the only professional on the site was the architect of the studio we were doing research about. All other participants had jobs not related to construction works².

Because the project had been funded and approved by the city council, it was legal – and indeed while there, neither police nor other institutions paid us a visit, though everything was happening in a very visible and central place. However, from what the architect told us, the mayor expected a much smaller construction, developed only on the ground floor. In the language of the architect the project was then moving from being legal to being alegal, i.e. not completely illegal, however pushing the boundaries of what agreed with the public administration. The aim of the two-day work during the weekend was indeed finishing the two-story structure before the city council could question it.

In what follows, through some ethnographic vignettes, we will outline the work on that construction site on the day we were there and from them we will develop few reflections about collective design and co-production.

For those who know guerrilla architecture, the network of Arquitecturas Colectivas or Spanish art and design practices working in between aesthetics and activism, it will not be difficult to recognize the studio and the architect and even the project we observed. As for now, we have preferred to leave

² The studio uses the Spanish regulations drafted for participatory architecture in order to carry out these kinds of projects. The architect has indeed a deep understanding of such legislation. He considers such knowledge key to run a studio like his own. The first time we met, one of the first things he asked, in order to prove our inaptitude as academics, was if we knew the Italian legislation on the matter.

everything anonymous, not so much for the sake of anonymity of those, whom we observed, but because we do not intend to ascribe our observations and reflections to the architectural studio, to the project or the construction site we observed. Indeed, our observations and the following reflections are very circumscribed to only one day of participant observation and can be hardly extended to other situations. Thus, we do not want the readers to identify the architectural studio, the project or the construction site, which are defined by many other processes, events, and circumstances, with what we observed. Nevertheless, we deem our observations do provide inputs for reflections on collective design and on co-productive paths.

Ethnographic vignettes

Our arrival

We arrive at the construction site. It is a sunny April Saturday, 10 am. Few people are already gathered around the architect. They are assessing the state of a small building that is meant to become a bar.

The ceiling, which displays a very peculiar structure, has some rotten beams. A wall on the back needs to be teared down, too. The architect and some of the local people decide what to do for the day, in order to start renovating the small building.

The architect is now back outside and other people are now gathering, here on the main playground, where the most important work – the two-story structure – has to be completed by tomorrow night, before the new week starts. Monday, the mayor, whose office has a view on the construction site, will get back to work and will find the structure completed – a sort of surprise.

As the architect told us in a long interview about his practice the day before, acting rapidly in order to catch institutions on the wrong foot is one of the studio's tactics.

While we, together with other local and non-local voluntary construction workers, gather around a trunk full of safety gears lent by a local craftsman, waiting for instructions, other people are already working on the upper floor of the two-story building that needs to be completed. They already know what to do and how to do it. They are preparing the structure in order to secure the stairs that will connect the upper floor with the ground.

While above work runs fervently, below people wait and basically hang around.

Hanging around 'courtesans'

While waiting for directions about what to do, we find the time to visit, guided by some local squatters, the old cultural multipurpose center: a huge complex, more than one century old, now almost completely rundown. In the last twenty years or so, it has been used by squatters as a venue for concerts, events and meetings.

We soon understand that, not only we are not the only newcomers, but also that we are not the only ones not directly affected by the construction, nor directly interested in it – like the local squatters or the members of the *Architecturas Colectivas'* network are. Besides us, there are other people more interested in the architect, than in the works: architecture students, other researchers, former collaborators of the architect living in the area coming to pay a visit, a publisher that has worked with the architect.

Given the informal atmosphere and the fact that many people do not know yet what to do, it is not easy to understand, at first, who is there to actually build together, who is there for the architect, but willing to provide a hand – like us –, and who is there just for watching, taking pictures and greeting the architect.

Little by little, as soon as people are given tasks or find something to do themselves, the distinction between working people and bystanders starts to be a bit clearer, even though the passage from one role to the other remains quite fluid all along the day. Some persons however, maintain their role of bystanders all the time, playing, to our Italian eyes, the role of sort of alternative *umarell*³.

Beside the different roles and the different engagement in the construction works, nobody feels really as an outsider. This is so also because the architect pays attention to everyone, being able to pass from working with a tool, to a consultation regarding the planning of the works, to a joke with visitors, in an imperceptible flow that makes him the glue of all the people present on the construction site.

³ *Umarell* is a term popular in Bologna [increasingly used in other parts of Italy] referring specifically to men of retirement age who pass the time watching construction sites, especially roadworks – stereotypically with hands clasped behind their back and offering unwanted advice' (see, <https://en.wikipedia.org/wiki/Umarell>).

Working and safety

Finally a common task. It is time to take out the metal stair to be handed out to the guys above who have set the system to fasten it. It has been kept in the rundown dance-hall and a group of six men, including the two of us, is charged with brining it out.

We distribute ourselves around the stairs. The architect is one of us and helps and provides directions.

It is much heavier than we thought and without gloves, it would be impossible to grab and move it.

Everything goes fine, until we are outside. The maneuver to lay it down results much more difficult. Changing the position of the hands in coordination with the others is not easy.

One of us will write in his notes: 'I really feared I was going to mess everything up. Besides damaging the stairs and injuring someone, including myself, what I feared was showing my inaptitude to this kind of work, somehow corroborating the architect's distrust of academic people. In the end, everything works, but I felt how easily an accident can happen'.

Few minutes later, we are again confronted with a dangerous situation. We try to help to cut wooden boards with a circular saw, which is not well fastened on a shaky table and whose safety gear had been removed.

Luckily, one of us is a quite skilled craftsman and knows how to handle the tool. However, we do not keep working with it for long.

The architect tells us that on his construction's sites no accident has ever occurred.

From what we have experienced, a complete lack of accident sounds strange and, then, somehow also plausible, given the backlash an accident would have caused to the *Arquitecturas Colectivas* network.

It is evident that the architect takes and manages a lot of risk, but somehow he seems able to take care of all that, probably also by creating a convivial atmosphere. One of the bystanders, a former kindergarten teacher who had worked with the architect before in a project involving children, confirms that to us: 'Nobody could carry out a project like [the one I had in my former kindergarten], but the architect'.

Nevertheless, we do carry out some formalities that could guarantee us under many respects, providing very likely some sort of insurance. At a certain point a name register of the people working on site for the day appears and we have to fill it. The architect underlines the relevance of filling it.

Such a procedure seems a bit in contradiction with the general informality characterizing the construction site. However, it is not. The architect and his studio do work on the edges among – as he calls them – legal, alegal and illegal practices, engaging in all of them in order to accomplish their plans⁴.

Leading from within

Once the stair has been fastened also on the ground, the architect is the first one to try it out, with few abrupt movements. He is now standing on the stair, which somehow provides him a stage. Everybody looks at him.

It seems rather obvious that the architect with his nonchalance loves to be at the center of everyone's attention, but not in a negative sense: he seems to be getting a lot of fuel from this and his collaborators play the game along and everyone seems to like and respect him. For sure he is *the* expert on site – the person who you need to ask if you have a doubt of how something needs to be done, or what needs to be done; the person whose approval is looked for by those contributing to the works. But at the same time he is extremely skilled in crafting collective situations with a high degree of conviviality, in which he 'floats around', from task to task, from group to group, making jokes, giving advice, offering beer, loosely directing the construction and generally coming across as a hanging-loose yet encouraging and (morally) supporting subject. Supporting, encouraging, driving and inspiring collaborators and co-builders not just technically or design-wise, but also, most importantly morally, seems to be one of his key-skills. He is an energetic, positive leader who enjoys switching between different roles and power-positions (director, tech-guy, co-builder, entertainer, drinking buddy, etc.). People trust him, his expertise, ideals and methods. This is why in this case he seems extremely well integrated in the group – not only socially but also from the looks.

Controversies

Afternoon, the architect takes the initiative and starts making a tilting wall for the lower part of the structure, in order to close it, however not

⁴ We have no idea of the legal liability of the architect in case of accident. Somehow, we oversaw this aspect while with him and during the interview. This is clearly a lack of our research, which is due to the fact that we were not there to research about the construction site.

permanently. Some of the local squatters are surprised by this addition. They would have preferred the lower part to stay open.

Despite such disagreement, the construction went on following a design that was evidently not public, but very clear for the architect. The small controversy that ensued is very soon closed by the architect, simply starting to build the tilting wall.

Others follow the architect in building the tilting door.

Contributing

The day is almost gone, and we have actually contributed very little to the construction. We are a bit frustrated of the whole situation. Out of will to be seen as proactive and skilled by others, once the group building the tilting wall takes a break in order to chat and have a beer, we grab the circular saw, OSB boards and drilldriver they were using and imitate what they had been doing before, in order to build a second element of the tilting wall. One of us, competent in woodworking, knows quite well how to reproduce the steps carried out by the other group. The other of us can only follow his instructions.

We manage to put up a second element of the tilting wall.

Some tentative reflections

The co-production practice we have presented differs, on many respects, from those that today are usually considered and highlighted, such as those related to fab labs or makerspaces. For the latter, indeed, digital technologies are key, as tools through which work is carried out individually and as tools through which work is shared collectively.

Of course, as we already mentioned, what described relies on networks that are enacted through the Internet, which allows the situation we described to be more open and more collaborative. However, Internet is not necessary in order to start and carry out a collective architecture project, and indeed the architect started to work in this way already in the '90s, when internet was starting to be diffused – not to mention the ever existing vernacular architecture projects, which usually presuppose a collective co-producing dimension.

Nevertheless, we deem that the practice we have described is relevant and interesting in order to reflect on the new collective-based forms of (knowledge) production, even when they are more grounded in digital technologies like, for instance, 3D printing.

We provide here two streams of tentative reflections: one about the tensions between designing and making and another one, strictly related to the first, about the mediations present on the construction site that allow the collective production to be articulated.

Designing and making

One of the features of the practice we observed that has stricken us is the absence of a blueprint or of drawings or of renderings or of sketches on the site. In short, the absence of any form of architectural design – here intended as ‘a set of signs aimed at providing instructions for a determined future transformation of a place’ (Armando and Durbiano 2017: 93), almost as if there was no design. Nevertheless, we know that there was a designing phase, which in its general aspects was co-designed by the architect together with the local squatters⁵. The latter, however, were missing the details, given the controversy that emerged about the tilting walls. We also know that there are CAD drawings in the computers of the studio, which were also probably used to present the project, or part of it, to the mayor.

However, on the construction site no trace of the designing process was present. What was present was, instead, the designer, or one of the designers, the architect. Besides the architect, present were also many materials and elements – a cargo container, metal beams, OSB boards – which, as components of the architect’s ‘kit’, must have been selected and recovered on the base of a design project. These components of the architect’s kit are usually reused from project to project, given the ephemerality of many of them.

Thus, on the construction site all the focus was on making.

Such focus has its consequences, as we have seen and as we are going to better highlight.

Before getting into this issue, we want to avow that our surprise about the absence of architectural designs on the construction site was due to our ignorance of architectural construction processes. Indeed, by reading literature about construction sites, we discovered that also commercial construction sites are usually characterized by a focus on making in a similar way to the one we have observed, at least for what concerns workers and low management (see for a striking example Löwstedt 2015). These are

⁵ We do not know the details of the process. We have gathered few information through talks with the architect and with the squatters and through the Internet, where there is a scanty documentation of co-designing sessions.

indeed the figures on which ethnographies of construction sites usually tend to focus (Löwstedt 2015; Pink et al. 2010; Pink, Tutt and Dainty 2012). These studies are indeed mainly interested in investigating issues related to safety (among others, Doria 2014), working knowledge (among others, Gherardi and Nicolini 2000) – the latter, in the end, also related to safety issues – and on masculinity (among others, Iaccone 2005). These studies do not tend to focus on the issue of the translation of the design project into the actual construction, as recently noted also in Sharif (2018)⁶. For instance, Pink et al. (2010) complain that, whereas there are ethnographies of design studio, there are few ethnographies of construction sites. However, Pink et al. (2010) do not problematize the passage from one place to the other, somehow missing the issue that not only connects two situations, but that also provides, or should provide, their meaning.

We deem that the issue of the translation of architectural designs from the studio to the construction site and then into the actual building is key for both architectural studies interested in the ‘power of the project’ (Armando and Durbiano 2017), as well for STS, interested in the translations between inscriptions and things (Latour 1999)⁷.

As for the construction site we observed, the focus on making gave way to a loosely directed do-ocracy, i.e. ‘an organizational structure in which individuals choose roles and tasks for themselves and execute them’ and in which responsibilities ‘attach to people who do the work, rather than elected or selected officials’⁸. This is basically the way we started acting when we intended to actually contribute to the construction and decided to continue the work on the tilting wall, while those who had worked before took a break. Do-ocracy is one of the forms of management considered and

⁶ However, things are changing in relation to the diffusion of Building Information Management (BIM) systems on construction sites; see, for instance, Davies and Harty (2013), Mäki and Kerosuo (2015), Sackey (2014).

⁷ Sharif (2018) apparently focuses on the transfer of the design project in the actual construction sites – ‘the travel from conception to realization’ (Sharif 2018: 158). However, he takes into account not so much the process of construction as a translation, but the discrepancies between the design projects and the way it has been constructed and the way it starts to be used. If Sharif (2018) approach is original for architecture, it is not for other fields of design, where STS have always looked at the discrepancies between what has been designed, its implementations and its uses (among others, Akrich 1992; Akrich 1993). As for an account of a product design project’s translation into a prototype, see Parolin and Mattozzi (2013; 2014). Interesting considerations can be found also in Henderson (1999), in relation to mechanical engineering and the construction of prototype machines.

⁸ <https://communitywiki.org/wiki/DoOcracy>.

advertised by some relevant examples of emerging innovation ecosystems like fab labs, makerspaces or hackerspaces. For instance, Noisebridge, a famous hackerspace in San Francisco introduces itself on its Internet site by saying that it is a ‘hackerspace for technical-creative projects, doocratically run by everyone’⁹.

Despite being considered ‘a decentralized, anarchist way of deciding and managing how things get changed’, as Noisebridge defines it¹⁰, what we experienced, in a project whose scale requires a certain level of coordination, is, first of all, the emergence of hierarchies and, secondly, of barriers to participation and to actually co-producing. As for hierarchies, as they emerged from the construction site we observed, they are the following: top, those who know what to do and can provide examples; middle, those who are competent enough to follow the example – one of us; bottom, those who are not competent enough and can only follow directions and instructions – the other of us. Somehow, what we discovered is the quite banal evidence that a ‘do-ocracy’, focused on performance, is grounded on a ‘competence-ocracy’ – if we do not share the same competences, of course the ‘do-ocracy’ that will result will be quite hierarchical. All that does not mean that ‘do-ocracy’ or ‘competence-ocracy’ do not work or are deceptive, but simply that they do produce hierarchies – situated, immanent hierarchies, if you want, rather than a priori, transcendent hierarchies of traditional organizations, but still hierarchies.

Also, what is produced are, as we said, barriers to participation. For us indeed, was very difficult to join in the flow of work and to contribute to it substantially.

The issue is then not only related to manual-technical competences – one of us is an expert, for that matter –, but also to organizational competences:

- on the one hand, knowing ‘what to do next’, in order to be able to anticipate it or to follow it up,
- on the other, knowing how to actually sneak in in a workflow without interrupting it, which is related also to interactional competences – of course not speaking the local language, though understanding most of it, made things even more difficult.

These organizational competences are in part situated and immanent – knowing how to act here –, but in part are related to having an overview of

⁹ <https://www.noisebridge.net/wiki/Noisebridge>

¹⁰ <https://www.noisebridge.net/wiki/Do-ocracy>

the project and of the workflow. The latter can be provided by elements that transcend the specific situation, like designing and planning outputs like blueprints, sketches, plans, schedules, etc., and by the occupation of a certain position or of a certain role within the entire designing-making process. Therefore, as suggested by one of the reviewers, hierarchy precedes knowledge-competence. Still, it could be said that a form of ‘do-ocracy’ is still in place, if we consider that a certain hierarchical position derives from what one has done in the designing-planning phase. Thus, what becomes relevant is the different point of view presupposed by the designing and making phases – global and from a distance in the first case, local and engaged in the second – and how it is possible to shift from one to the other and how it is possible to share them. We think that in relation to these shiftings, designing outputs, like blueprints, become key.

These hierarchies and barriers should be acknowledged and addressed in a framework of co-production, in order to allow everyone to take part to the production – according to their competences – and to increase their competences.

Mediations

Competence and performance, making do and doing, the passage from one to the other and the sharing of these processes lead us to address mediation. Which mediations take part and dispose the unfolding of agency we described?

As it has emerged, the construction process we have described does not entail the presence of the architectural designs. However, present in our case, was the architect. He carried out the main mediation, knowing also more or less by heart the design and thus mediating between the design and the construction¹¹.

The architect mediation does not concern only the knowledge about the project, but also the various relations among those present on the construction site, in order for the agency to unfold smoothly, following different rhythms that had to do more with constructing a convivial atmosphere than actually constructing the building. We suppose that it is

¹¹ Yaneva (2008) is the only study we have found where an architect is observed on the actual construction site, while the construction is taking place. However, Yaneva (2008) is focused more on the way the building, already built and under renovation, acts on the architect than vice versa. Indeed, through Yaneva’s account, we see very little of the renovation design and how it is carried out and eventually changed by the architect. For an architect on the construction site before the construction and the design project, see Houdart (2016).

also because of the specific emerging convivial atmosphere that accidents are basically absent from the architect's construction sites.

Nevertheless, the architect's one is not the only mediation on the construction site. Artifacts too carry out their mediation. For instance, the presence of the two-story building disposed upper and lower positions and consequently a hierarchy of competences. Only when another artifact, namely the stair, became part of such configuration, it carried out a further mediation, disposing a change of the configuration and allowing a passage between up and down and initial blurring of people with different competences.

Artifacts mediate the construction also in another way, given that the architect often chooses to combine recovered semi-finished constructions materials such as OBS boards, window frameworks acquired as gifts, orange steel beams, containers, etc., which also provide a relatively recognizable style to his studio. These recovered objects already influence the design.

On the one hand the designing process is redistributed among various human and non-human actors (the recovered semi-finished elements, the various persons of the studio, the squatters as the group participating in the project), thus, actually accomplishing a redistribution of the architectural practice as framed by ethnographers (Yaneva 2009) and as intended by some architectural theoreticians (Armando and Durbiano 2017). On the other, the architect recovers an authorial position within the construction process, where he works as the main mediator.

In this way, then, not only more relevance is provided to making rather than designing, but also the architect assumes an original role, within and through the making process. He does not find his authoriality before the design project, in his intentions, ideas and sensibility, then conveyed by the design project, as those idealtypical architects outlined in Armando and Durbiano's typology (Armando and Durbiano 2017: 48-80) – 'architect of the prince' or 'guarantor architect'. He finds, instead, his authoriality after the project, first in the negotiations clash with authorities – not observed by us¹² – and then in the management of the construction site, as we have seen.

¹² Within the negotiation with the mayor and his office, the project or, better, the projects played a role, which goes beyond the one of providing an overview of what will be done. As the architect told us, when he, another person from the architect's studio, as well as two representatives of the squatters, went to negotiate with the mayor, they brought with them many different projects and asked the municipal administration to decide which one to authorize. This move allowed the architect and the squatters to gain time against the municipal administration, which was stuck in a decision process. It is very likely that the project we were

By assuming the architect's words we can define his role 'guerrillero leader', who has the tactical know-how to carry out an antagonist project (Fuad-Luke 2015), going against the official authorities, by leading a small group and taking official authorities on the wrong foot:

[My studio] was born, looking for all the laws and regulations to give the tools [to] different people in order to say 'it is possible'. But you, as a citizen, you have to check the regulations and then it will be possible. [...] So I started to study [...]. We have [many] projects, more than those the politicians [can fight]. Never in my life we can collaborate. [...] In my experience is always a fight, but I don't want to fight. I want to use our law and collaborate but when the politician is a hijo de puta I can attack [...]. For us it is very difficult to find money for our work. The others have the time and money. So, for me the first thing is using the law in our favor and the second thing is bringing [in the negotiations] people to add so much information and experience.

As it is common in co-productive paths characterizing new forms of co-production like fab labs or makerspaces, also in the case of Arquitecturas Colectivas that we have observed, the designer has to cover various different roles such as that of the facilitator, activist, strategist and cultural promoter (Manzini 2016). These are all roles that can more or less downplay authoriality. However, the architect covered them all and in doing that, he has been able to reshape architecture authoriality, letting it emerge within the making phase of the design process, rather than within the designing process. From what we saw and heard, in the end the architect's studio works as a cultural promoter, intended here as an educator that, besides the construction of buildings, educates people to reclaim public space.

Conclusions

Based on some ethnographic observations of a collective architecture's construction site, our chapter has tried to propose some reflections on the role of design and designers within new forms of collectively shared design processes.

building had not been yet approved, but was one of the variations presented and waiting for approval. This is an aspect we need to delve into. Therefore, as for what we gathered, the project, though not present on the construction site, did play a direct role in the 'guerrilla architecture' processes initiated and lead by the architect.

The construction site, which we observed and to which we took part, is of course not so technology loaded, nor innovative as makerspaces, for instance, can be. And yet, characterized by collaborative, open and challenged-based production, we deem it can be considered an example of these new collective-based forms of (knowledge) production.

Our contribution touched upon two other issues little considered in the present ethnographic literature on architectural practices and construction sites.

First, we tried to look at the ways in which architecture in the studio and construction in the construction sites are connected and, especially, how a design project gets translated into a construction. Despite our case is peculiar, given that the translation was carried out directly by the architect and the design project basically disappeared, we deem that our paper, though limited, opens up an issue that has been to our knowledge disregarded in both studies of architectural practices, as well of construction sites.

Secondly, we took into consideration not only the collective aspects of architecture and, especially construction, but also the ways in which a figure emerges from this collective work, with a different role from the others. It seems to us that also this aspect has been in part disregarded, in part not focused enough. For instance, Yaneva (2009) noticed various mediations through which Rem Koolhaas, the archistar head of the studio she observed, constructs his different role (e.g. having an office which has view on the studio or writing books that architects of his studio read and consider). However she never really addressed the issue. Nevertheless, as emerges clearly also from Smitheram and Kidd (2018), studio owner or associates have a different role in the design process and this should be accounted for. Despite the fact that this issue can be seen as a more traditional ethnography of work issue, we think that STS could relevantly contribute in analyzing how work hierarchies are built and maintained through heterogeneous practices.

Finally, through our reflection, we raised the issue of the role of the design project intended mainly as drawings of various kinds (blueprint, renderings, sketches), within processes of co-production that tend to be biased toward making. We deem instead that design projects in the form of visualization artifacts could have a relevant role in providing an actual ground for discussion, for collective reflections, for co-designing, for shifting from designing to making and *vice-versa* and for allowing others entering in

these processes, thus granting the actual development of a shared collective process.

References

- Akrich, M. (1992) The De-Description of Technical Objects. In W. Bijker and J. Law (eds) *Shaping Technology/Building Society*. Cambridge, Mass: MIT Press, pp. 205–224.
- Akrich, M. (1993) Essay of Technosociology: A Gasogene in Costa Rica. In P. Lemonnier (ed.) *Technological choices. Transformation in material cultures since the Neolithic*. London: Routledge, pp. 289-337.
- Armando, A. and Durbiano, G. (2017) *Teoria del progetto architettonico. Dai disegni agli effetti*. Roma: Carocci.
- Davies, R. and Harty, C. (2013) Implementing ‘Site BIM’: A Case Study of ICT Innovation on a Large Hospital Project. *Automation in Construction*, 30 (March): 15–24.
- Doria, S. (2014) *La sicurezza in costruzione. Etnografia di un cantiere: uno sguardo pratico sulla sicurezza sul lavoro*. Roma: Carocci.
- Fuad-Luke, A. (2015) Design Activism’s Teleological Freedoms as Means to Transform Our Habitus. In A. Fuad-Luke, A.-L. Hirscher and K. Moebus (eds) *Agents of Alternatives – Re-designing Our Realities*. Berlin: Agents of Alternatives, pp. 280-296.
- Gherardi, S. and Nicolini, D. (2000) The Organizational Learning of Safety in Communities of Practice. *Journal of Management Inquiry*, 9 (1): 7–18.
- Henderson, K. (1999) *On Line and On Paper: Visual Representations, Visual Culture, and Computer Graphics in Design Engineering*. Cambridge: The MIT Press.
- Houdart, S. (2016) Architecture in the Wilde: The Studio Overflowed. In I. Farias and A. Wilkie (eds) *Studio Studies. Operations, Topologies and Displacements*. London: Routledge, pp. 120-136.
- Iacuone, D. (2005) ‘Real Men Are Tough Guys’: Hegemonic Masculinity and Safety in the Construction Industry. *The Journal of Men’s Studies*, 13 (2): 247–266.
- Latour, B. (1999) *Pandora’s Hope: Essays on the Reality of Science Studies*. Cambridge, Mass.: Harvard University Press.
- Löwstedt, M. (2015) ‘Taking off My Glasses in Order to See’: Exploring Practice on a Building Site Using Self-Reflexive Ethnography. *Construction Management & Economics*, 33 (5/6): 404–414.

- Mäki, T. and Kerosuo, H. (2015) Site Managers' Daily Work and the Uses of Building Information Modelling. *Construction Management and Economics*, 33 (3): 163–175.
- Manzini, E. (2015) *Design, When Everybody Designs: An Introduction to Design for Social Innovation*. Cambridge, Mass.: The Mit Press.
- Parolin, L. L. and Mattozzi, A. (2013) Sensitive Translations: Sensitive Dimension and Knowledge within Two Craftsmen's Workplaces. *Scandinavian Journal of Management*, 29 (4): 353–366.
- Parolin, L. L., and Mattozzi, A. (2014) 'Come meglio credi'. Conoscenza tacita e innovazione nel distretto del legno-arredo della Brianza. *Polis*, no. 3/2014: 365-392.
- Pink, S., Tutt, D. and Dainty, A. (eds) (2012) *Ethnographic Research in the Construction Industry*. London: Routledge.
- Pink, S., Tutt, D., Dainty, A. and Gibb, A. (2010) Ethnographic Methodologies for Construction Research: Knowing, Practice and Interventions. *Building Research & Information*, 38 (6): 647–659.
- Sackey, E. (2014) *A Sociotechnical Systems Analysis of Building Information Modelling (STS@BIM) Implementation in Construction Organisations*. PhD Thesis. Loughborough: Loughborough University.
- Sharif, A. (2018) Ethnography of Transfer: Exploring the Dynamism of Sustainable Architectural Design in Masdar. *ARDETH*, no. 2, pp. 157-175.
- Smitheram, J. and Kidd, A. (2018) 'Concrete Drawing': An Ethnographical Study of Design, Matter and Affect. *ARDETH*, no. 2, pp. 177-196.
- Yaneva, A. (2008) How Buildings 'Surprise': The Renovation of the Alte Aula in Vienna. *Science & Technology Studies*, 21 (1): 8-28.
- Yaneva, A. (2009) *The Making of a Building: A Pragmatist Approach to Architecture*. Oxford: Peter Lang.

