

## Prototyping

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### Abstract

The prototyping of method calls for, at a minimum, three operations of design: rethinking the proprietary and legal economy of research; rethinking the frontiers that separate those who use methods from those to whom methods are applied to; designing infrastructures of apprenticeships for every problem.

### Re-sourcing

The website and digital database of the Spanish guerrilla architectural platform *Inteligencia Colectiva* (IC) showcases hundreds of designs of do-it-yourself, retrofitted, community-driven, grassroots technological and architectural solutions and adaptations from all over the world.<sup>1</sup> These designs, which include diagrams and architectural sketches, 3D renders, text, photographs and even videos, are all licensed freely with creative commons licenses. They are open-source prototypes, as IC likes to think of them: designs that are at once gratis and 'free' to access, but also technical templates that simultaneously 'free' the very practice of design by enabling third parties to extend, modify, adapt or simply share the original source code. They are prototypes that liberate design as both a technical and cultural practice.

The prototypes that IC documents in their website offer an example of how the philosophy of free and open-source (F/OS) software has taken root in domains of practice that extend well beyond the digital realm. Architects, artists, designers, engineers, activists and grassroots organisations have found in the philosophy F/OS a toolkit for reimagining the material, aesthetic and environmental affordances of their work. Every component and aspect of their work, whether it be the infrastructural systems that support it or the aesthetic languages and registers that frame it, whether the dimensions of its material exchanges or its collaborative dynamics, are held to examination as both *resources* and *re-sources*: that is, for their capacity to work as foundations and support-structures but also as springs and openings for future extensions and modifications. In this sense we may think of the concept of *open-source prototyping* as a figure of complexity that is 'less than one and more than many': a prototype is always less than itself, in the sense that the source code enables expansions and bifurcations to the original design. Therefore, the design never reaches closure, it is never 'one' properly speaking. At the same time, the very possibility of having new additions and modifications defines the infra-ontology of prototyping as 'more than many', for the source code remains forever open to 'more' designs being added to the 'many' already in existence (Corsín Jiménez 2014).<sup>2</sup>

In this guise, the language and praxis of open-source prototyping provides an instance of complex, adaptive, self-organized systems whose heuristic and metaphoric vectors are not drawn from biology, chemistry or physics (cf. Barad 2007; Stengers 2010). These are emergent socio-infrastructural assemblages that re-source themselves through

an inventive and on-going exploration of how human and nonhuman sources and resources – including legal licenses, technical specifications, organic and inorganic processes, or social relations – work on each other. They delineate the contours of ecologies that are forever 'in beta' (Corsín Jiménez and Estalella 2017).

Such an understanding of how open-source prototypes work differs in important and significant ways from how the concept has historically been used in design and engineering contexts. As the standard dictionary definition has it, a prototype is an original on which something is modelled; that is, an exemplar or first model. In the history of science and technology, the process of prototyping has traditionally been marginalized as a backstage operation. Prototypes were hid inside the 'black boxes' of engineering and design processes (Winner 1993): the prototyping phase of a design project indexed that stage where decisions regarding the use of components, materials, protocols or standards were thought-of as residual and of secondary importance; processes whose very subjection to on-going revision and reassembling, whose inhabiting a space of messiness and uncertainty invited no interest or curiosity. Prototypes were thought to be little more than drafts, provisional templates whose bodies functioned as tests grounds for trials and errors, groundwork and experimental assays whose efforts pointed somewhat unremarkably to things-that-were-not-quite-objects-yet.

### **White-boxing**

Recent interest in the material semiotics and biographies of modelling practices has allowed us to unpack and recuperate the prototype from its relegation within the black boxes of the history of science and technology (Chadarevian and Hopwood 2004; Daston 2000). In particular, scholarship on critical making and open source design invites us to reconsider prototyping from a *white-boxing* perspective, where the emphasis is on how socio-technical practices constantly exfoliate, disclose and re-source their capacities for agency and relation (Corsín Jiménez, Estalella, and Zoohaus Collective 2014).

As both method and epistemic orientation, white-boxing opens up novel vistas for social theory. First, it shows us how the work of prototyping has traditionally been tensed against the proprietary boundaries of technology. It makes evident the role that the opacity of black boxes has played in keeping industrial designs secret. Prototypes were only allowed to upgrade from the 'proto' phase to the final 'type' stage once properly locked into an intellectual and industrial property regime (Biagioli 2011). There was therefore an existence *before* and/or *in suspension of property*: where the relations between persons and things remained as yet unmediated by the entanglements of ownership or authorship. Similarly, black boxes contributed towards keeping knowledge 'in places' (in boxes, so to speak), such that it became meaningful to speak of the places and geographies of technoscience: university and industry laboratories, science parks, etc. (Smith and Agar 1998). In their place, from the perspective of white-boxing, we can ask instead about the recursive processes through which the 'proto' and the 'type' have been parenthesized with respect to each other: what tensions and practices traverse such states of suspension?; why is there a parenthesis to start with?, what is it about a prototype that makes us imagine it as being 'stuck' in a permanent state of anteriority?; and finally, how does form finally emerge out from the parenthesis, what drives the extraction of the proto-type?

White-boxing further allows us to understand how prototyping has demarcated a political economy for the circulation of expert knowledge. Prototypes have signalled to the umbra separating experts from lay people, scientists from amateurs, insiders and outsiders to the technoscientific black box. In this sense, a perspective focused on white-boxing challenges how expert knowledge travels and circulates in society by destabilizing the epistemic status of technology itself as a sociological vector. The sources and resources most often associated with technoscientific expertise – laboratory equipment, scientific authority and credentials, university settings, intellectual property – are seen, when looked at from a white-boxing perspective, to be constantly unfolding, hacked and re-sourced. If 'technology is society made durable', as Latour famously put it (1991), prototyping and white-boxing would therefore seem to make technology undurable, fragmented and dispersed. Or perhaps it is 'the social' that we should be looking at unboxing and destabilizing? Chris Kelty speaks for instance of how F/OS software 'modulates' anew the relation between power and knowledge: free software programmers work on themselves as a social and political community by working on (writing code, editing, patching, compiling, improving) the infrastructure that enables their coming into being in the first place. As an expression of a prototyping culture such 'recursive publics', as Kelty calls them (2008), would indeed seem to point to how white-boxing allows for novel forms and new locations of social durability to emerge – new expressions of cultural, political and aesthetic materiality and critique.

White-boxing finally comes full circle in helping us unpack and interrogate the very sources and resources through which we, as social scientists, take presence in the world. It invites us to reconsider the infrastructures, spaces and times that give shape to our research methodologies: What would social scientific inquiry look like if it were an open-source design?, if it were modulated recursively as it responded and accommodated to the disturbances, challenges and co-inventions of the fieldwork process? How does research wireframe itself into suspension? What would method look like as a prototype?

I have pointed at three re-sources through which the prototyping of method might take shape. First, by reconsidering the proprietary and, more amply, legal economy of research. In other words, making sure that we open access (consultation, readership, editing) to our work. There are a number of ways in which this can be done: licensing our work with Creative Commons licenses, avoiding publication in subscription journals, promoting the use of Open Access institutional repositories, as well as helping define the terms of discoverability (the algorithms, the metrics) that will shape the future public sphere of scholarly communication.

Secondly, the method of prototyping invites us to reconsider how the process of research separates 'researchers' from 'informants', experts from amateurs, knowledge-makers from knowledge-users. For instance, we may wish to ask about the role that methods play in the design of inquiry and analysis. What technologies, spaces, materials and social relations are bundled together in the production of method? Who gets to question our methods, when and in what terms, and do our methods have the capacity to incorporate such voices? In other words, is there scope for white-boxing our methods, making the people with whom we work party to our methodological agenda and design?

Finally, this explicit self-grounding of the problem of method as something that is constantly 'prototyping' itself calls for re-examining the multiple and criss-crossing 'trajectories of apprenticeship' through which research comes into being (Pignarre and Stengers 2011). We prototype by designing an ecology for every method: one where we stake stock of our mutual competences and constrains, our respective obligations and requirements, the resources and the conditions through which we each, collectively and individually, operate. We prototype every method when we come to the realisation that the organisation of research calls for nothing less than the design of an *infrastructure of apprenticeships*.

## References

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## Notes

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<sup>1</sup> Inteligencias Colectiva, <http://www.inteligenciascolectivas.org/>

<sup>2</sup> A playful take on the 'more than one and less than many' that Marilyn Strathern (2004) suggested characterises fractality as a figure of contemporary complexity.

## Biography

Alberto Corsín Jiménez is Reader in Social Anthropology in the Department of the History of Science at the Spanish National Research Council in Madrid. He is the author of *An Anthropological Trompe l'Oeil for a Common World* (Berghahn, 2013) and editor of *Prototyping Cultures: Art, Science and Politics in Beta* (Routledge, 2017), *Culture and Well-Being: Anthropological Approaches to Freedom and Political Ethics* (Pluto, 2008) and *The Anthropology of Organisations* (Ashgate, 2007). His current work examines the rise of an urban commons movement and the development of open-source urban hardware projects by architects, artists, and engineers.