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Anaïs Bloch, Nicolas Nova

► **To cite this version:**

Anaïs Bloch, Nicolas Nova. Smartphone repair stores, ecosystems of care for material objects. *Vigia*, 2022, 2, pp.172-181. <hal-03980691>

HAL Id: hal-03980691

<https://hal.science/hal-03980691v1>

Submitted on 16 Mar 2023

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Smartphone repair stores, ecosystems of care for material objects

Anaïs Bloch and Nicolas Nova (HEAD–Genève, HES-SO)

Among contemporary consumer goods, the replacement frequency of digital devices is as important as it is problematic. Faced with this phenomenon, public policies emphasize multiple approaches, ranging from the right to repair to the support of various initiatives such as those proposed by maker cultures. If these are fundamental, we should not neglect the singular role of a whole ecosystem that is generally unknown, taking off in independent smartphone repair stores.

At the heart of the debates on the digitization, the question of the rapid obsolescence of digital equipment occupies an increasing place in journalistic investigations and research. This obsolescence is linked to the fact that digital equipment is subject to a regime of permanent innovation whose processes of invention and diffusion adapt to the values of the current economy, favoring a constantly renewed production. This versatility is reflected in the frequency with which devices are replaced, of which the smartphone is undoubtedly the most notable, but which also concerns computers, televisions, and other video game consoles.

This situation raises questions about the difficulty to reconcile the desire to move towards an "all-digital transition" with the imperatives of environmental redirection. The 2021 report by the French regulatory authority for electronic communications, postal services and press distribution (Arcep) mentioned the increasingly short duration of individual use of smartphones, also attesting to the fact that, in addition to the amount of greenhouse gas emissions produced by smartphone use, the mining involved in the production of the terminals was highly problematic. This activity, with its heavy social consequences - including child labor and the exploitation of the populations involved - is also problematic because it consumes energy and is a source of pollution, causing the depletion of natural resources. The production of new equipment represents the main impact of the total environmental footprint (75%). The rest is related to the energy consumption associated with their use (25%), as stated in a study by the Agency for the Environment and Energy Management. Faced with this growing scourge, the public authorities are trying to extend the life and use of digital equipment by implementing the anti-waste law for a circular economy; by setting up reparability indices; the right to repair, etc. These initiatives are relevant - in that they illustrate the possibilities of improving the situation through the implementation of a legal regulatory framework. It is also important to observe how this fight against obsolescence is experienced by the sustainability actors themselves.

In this context, the appearance of repair and maintenance places in hackerspaces, repair cafés and other unlicensed stores shows that individuals or entrepreneurs are trying to regain control in order to improve the durability of these devices. Unlicensed in the sense that these stores are not approved by the companies that produce these objects and therefore operate outside the legal and the technical framework offered by the brands. The recent emergence of a whole market of maintenance and repair services was hidden by the lack of consideration for the repair or maintenance of everyday consumer objects.

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Front window of a smartphone repair shop, Geneva

Before throwing away or replacing a damaged smartphone there are currently several possibilities to try to extend its life: go through the customer service of the telephone operator or the manufacturer, if the device is still covered by the after-sales service warranty. The existence of certified repair points is a second solution. Finally, non-approved stores, usually local stores, provide significant help. An economy of "reparability", peripheral to the industrialists, is thus gradually being set up.

It is this last type of little-known actor - as much in the fight for sustainability as a direct player in the digital industrial sector - that we have been interested in as part of a research project conducted between 2017 and 2019. In the form of a field survey carried out mainly in Geneva, Lausanne and Zurich, then completed with observations in Paris, Lyon and Marseille, we looked at repair spaces in stores not affiliated with major brands, as well as in hackerspaces/fab labs, and associative repair cafes. This work of anthropology of techniques aimed to document the different interventions in these places, and to understand how these actors build and mobilize ways of repairing, maintaining, and transmitting information about these obsolete objects.

This work allowed us to question the forms of writing and production of investigation materials within the framework of an ethnographic research. The production of drawings, observation sketches and the creation of research magazines allowed us to access certain spaces. When we presented them to the owners of the shops it brought us closer - through the didactic quality generated by the medium. In the field,

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we quickly employed this writing practice as a mode of observation and description, but also as a tool for communication and as an exchangeable resource. Our investigation shows some of the discoveries made during this investigation in relation to the issue of digital waste.



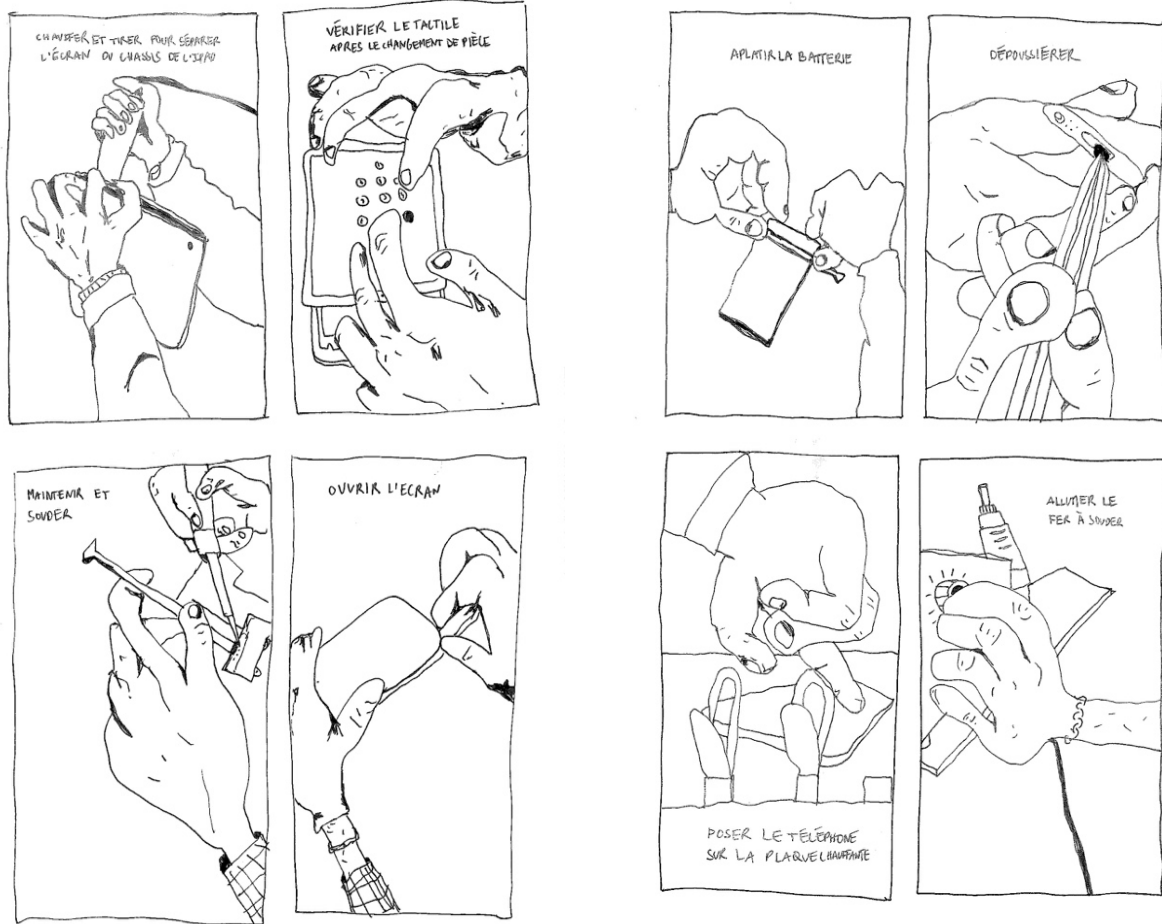
Production of a series of research fanzines exploring different themes such as repair gestures, tools and machines, stores visited etc.

Types of knowledge

A fundamental aspect of this work, related to environmental issues, concerns the ways in which repair store technicians construct, document, and share know-how about the maintenance of such a complex and closed object. Information about device design, repair processes for multiple models, hardware or software tools needed to intervene, access to official spare parts, and software libraries are not always made public by smartphone manufacturers; or only for certified repairers. As holders of a specific knowledge, repairers mobilize multiple knowledge and ways of doing things in their daily interventions: from diagnosing failures to the solutions to adopt, through the recognition of components or programs on which to intervene, not to mention the skills of listening and advising their customers. The constitution of this expertise is not homogeneous among the people we met in our survey. An ethos of discovery and exploration of technical objects is evident among the technicians (and the few female technicians we met) of these stores, as well as among the founders and participants of hackerspaces. This mindset goes through the curiosity to disassemble/reassemble or tinker with all kinds of devices. Such curiosity about technology and how it works is at the heart of the original definition of the "hacker"

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figure. This curiosity also manifests itself sometimes in exploratory practices, to improve tools or to transform discarded objects in order to find a new function for them. While a majority of the participants in our survey share this exploratory mode of engagement developed during childhood or adolescence, this is not the case for all, as some become repairers through entrepreneurial opportunity, or simply because this role was offered to them with on-the-job training.



Analytic sketches of repair gestures

Technicians trajectories

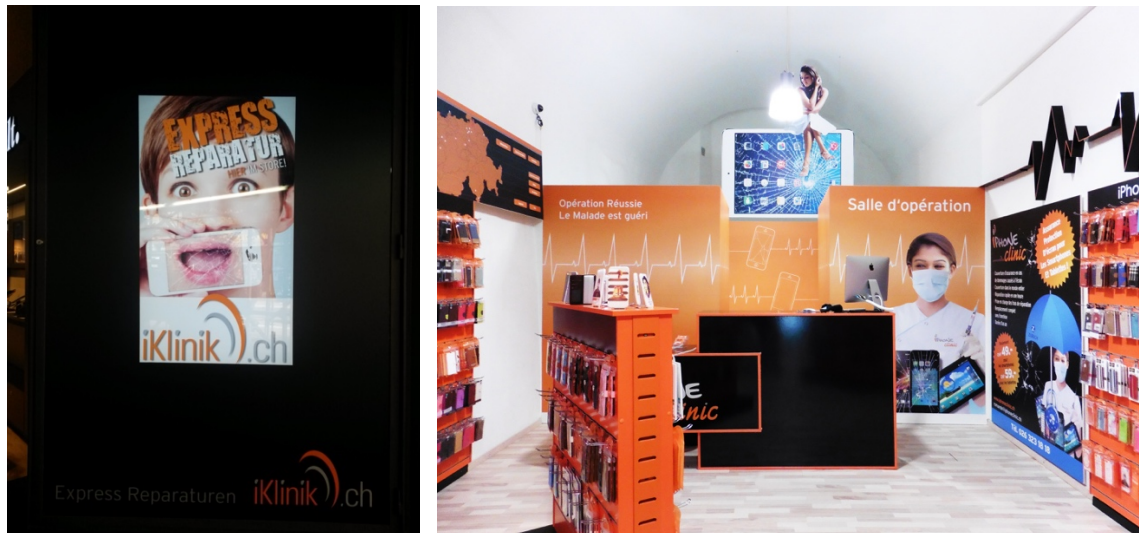
The multiple paths of the technicians we met in our survey correspond to a continuum of learning from initial technical training to self-training. If the latter can be based on the ethos we have just mentioned, self-training is also essential because of the constant influx of new models, designed with different components and thus leading to new problems. This updating of know-how is built through the collection of materials available online, or moments of exchange and sharing between peers. This self-training concerns in particular the acquisition of technical procedures and adequate gestures, for example the change of such or such part, the diagnosis of a problem with the camera, or the transfer of data.

These efforts also involve updating the practices and skills used to work on the terminals. Because of their commercial activity, which consists of serving customers with new models, most store repairers aim to update their knowledge of the models, as well as their problem-solving techniques, more or less systematically. And since the technical documentation for these devices is usually lacking, each technician resorts to a more tactical process of disassembling, observing, exploring and reassembling the new models - whether purchased for the occasion or owned by the customers - which sometimes results in lost or broken devices. This means that some stores sometimes offer services that may be beyond their expertise (data recovery), and use these situations as a way to grow their business. Here we find a form of "research and development" that takes place during the repair process, the artisanal counterpart to the R&D of manufacturers.

Interpersonal skills and competences sometimes already acquired by some people, which can echo the social and human dimension of the job: welcoming and listening to customers, their problems and the emotional dimension they cause, ways of making them wait or reassuring them, negotiating prices, advice on how to make better use of the device afterwards, discussion with dissatisfied customers... Particular attention is paid to the requests and needs of visitors of these spaces, where any type of demand will be answered, even if the problem is not chargeable or has nothing to do with a phone. This type of interaction based on listening seems to be possible in these spaces that are organized in an autonomous way, with less procedural steps than in chains such as in the Apple Store.

Although the types of services offered vary reasonably depending on the size of the store structure, this therapeutic dimension can be seen in the names of many of the stores themselves: Dr. Smartphone, iklinik, Docteur IT, etc.

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Medical metaphors on store signage

Although this aspect is fundamental to the repair and maintenance activities of technicians, it remains separate from the documentation of the techniques and procedures they use. It concerns primarily the repair and maintenance of terminals. Depending on the case, it takes various forms, from notebooks to binders filled with screenshots of forums and commented images, to printouts of disassembly reports found on the Internet, to videos recorded by some of the participants in our survey; sometimes with the implementation of an online information system for the most structured stores. These more or less formalized documents deal with topics such as lists of breakdowns, reconstitution of the plans of the appliances, identification of spare parts on the motherboard of the appliance, sequences of tasks to be carried out to solve such or such a problem or even lists of suppliers of parts from European wholesalers or in South-East Asia. The consultation of these documents, and their sometimes rudimentary or very rough character (through annotations sometimes crossed out in several languages, or through the use of diagrams) is a salient marker of the situation of intense asymmetry experienced by these repairers in relation to smartphone manufacturers.

TEARDOWN REPORTS
RAYON X - LG G5

"Nous sommes prêts à tout démonter, mais nous allons nous retenir un peu pour une session rayons-X offerte par nos collègues de Creative Electron. Nos yeux à rayon X nous trompent-ils, ou nous sommes en présence d'un iPhone ? Mise à part cette batterie qui se retire en moins de deux, bien sûr. Une petite plaquette en métal au centre, la carte mère à droite, la batterie au milieu à gauche. Tout est en ordre. La radio confirme que le G5 s'intègre parfaitement entre l'iPhone 6 (à gauche) et le 6 Plus (à droite). On dirait que le module placé en bas n'est pas seulement là pour la batterie et l'USB. Il est plus que temps de l'ouvrir."

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Extract from the fanzine 'Online Scouting' on existing online content

If such documents are very precious for their owners and are rarely communicated outside of the stores, extracts of them can however circulate from time to time via apps such as WhatsApp, online forums or in person during meetings, sometimes even between competing stores. This sharing corresponds to the existence of a community of practice around the repair and maintenance of digital objects. This includes both companies and stores specialized in component refurbishment services (screens in particular), freelancers, but also in a more distant way organizations such as iFixit that produce online documents, research bureaus that publish disassembly reports and other technical documents, as well as members active on online forums (gsmforum, cellphoneforum). This aspect also includes impromptu meetings between repairers from different stores, exchanges via regional or transnational WhatsApp groups with colleagues or cousins at a distance. The networks of repairers thus connected form a community of trust based on a transnational network, which can share advice, open doors, provide possible spare parts, fill in missing expertise, or provide remote assistance, as anthropologist Lara Houston also described in her Ugandan fieldwork.



Sometimes the shop is like a social club with repairers from other stores

This more collective dimension is also found in the constitution of networks of subcontractors and spare parts suppliers. These are made up of different links in the supply chain, official or unofficial, manufacturing and distributing components that are crucial to repairing terminals, of sufficient quality, and at a non-prohibitive price. This is a key dimension of the repairers' strength, since without this access, quick replacement of screens, batteries, buttons, antennas and so on is very difficult. This explains the difficulty for hackerspaces and repair cafés (unlike stores) that cannot

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intervene because of their lack of stock, unless participants bring replacement parts themselves.

If the possibility of ordering these parts directly from Chinese online platforms such as Alibaba is more common in stores, buying from official suppliers or from intermediary resellers in Europe is also frequent. Their owners mention the difficulty to control the components that reach them, which sometimes leads them to receive unusable parts to help their customers. Hence the use of alternatives that consist in the first place in "going to the source", i.e. going to the Huaqiangbei shopping malls in Shenzhen to acquire such parts from specialized companies. This is what some of them testify, emphasizing the privileged relationship they have built over time with Chinese suppliers, whose identity they do not want to reveal. It should also be noted that the parts in question purchased in Shenzhen are not always official or new, since they can also come from companies that replicate components, or from small craftsmen specialized in dismantling and reassembling second-hand smartphones. A way of doing things also exists here in Europe, with the use of spare parts constituted in stock by the stores themselves, the purchase of terminals in second-hand shops, or, more rarely, in connection with recycling shops (in the case of batteries).



Visit Huaqianbei, one of the largest shopping malls dedicated to the sale and refurbishment of electronic items in Shenzhen, China

This way of doing things (dismantling and reassembling second-hand smartphones) is also present in the repair stores visited in Switzerland. New ways of relating to the broken object emerge, whose status of waste is transformed into a resource that can be used to repair other objects. Broken objects are then stored as they are or

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sometimes dismantled and sorted according to their typology and their components. The cell phone stores participate in the field of recovery and recycling of broken objects working together with other companies when it comes to getting rid of what is considered irretrievable.



Used batteries that are then given to a company that recovers these items

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Stock of reconditioned screens to replace broken ones



Store window displaying second hand spare parts

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Laboratories to counteract obsolescence?

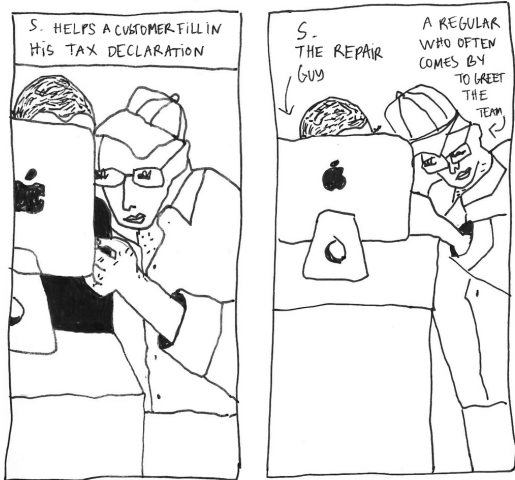
By learning these repair techniques on their own, by sharing them within regional and international networks, and by reconstituting around them a whole community of practice, these repairers deploy what Laurence Allard calls - an art of "counter-doing", a way of "doing differently" with digital objects parallel to the more visible world of manufacturers and start-ups. The repairers deal with technical problems, while accompanying customers in the use of their devices. This accompaniment can take the form of advice and best practices, either verbally or written on documents that decorate the stores. It concerns the means to make a defective device work again, to better use one's phone, or to better "manage" one's personal data. This type of advice is used as much as a commercial communication tool as a means of extending the concern for the maintenance of the device into everyday life, of passing on the idea of taking care of one's terminal, and more broadly of avoiding the waste of electronic or electrical resources, or even of fighting against the obsolescence of consumer goods.



A technician holds up a customer's open phone to show him what is wrong.



The technician manager explains the help she gave to an elderly client who was unable to use her telephone.



Sometimes the stores become a space of accompaniment of the customers and try to answer requests as diverse as varied

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In doing so, the activities carried out in these stores update in a way the promises evoked in public discourses about Fab labs and other Makerspaces for the last fifteen years, about the opportunities to design and manufacture in rupture with mass production, or about the possibility of reappropriating technical objects. If these repair practices will probably not be enough to turn the economy of digital devices around, our survey nevertheless testifies to the progressive implementation of an ecosystem of care towards material digital objects.

Note : The authors thank the Swiss National Research Foundation for funding the Dr. Smartphone project.