Technology

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Although many within the degrowth movement see technology as being something to reduce or remove as much as possible from life and society. Technology is in this sense seen as something not belonging to a simple, ecological and convivial living. Increased resource use, both associated with the production of artifacts of modern technology, but also to potential rebound effects emerging from the increase of efficiency are feared and criticized - and not without reason: modern technological advances are mostly resulting from and used as tools for further industrial advancement and growth. The complexity of the resulting industrial-technological complex is today supported by large institutions and corporations, which progressively distance its users from the technological choices and agency, the infrastructure that hosts it, the processes of technological production and of resource extraction.

What research on degrowth and technology has failed to present up to now is a coherent, critical vision on different innovations and movements that are emerging, in a combination of . It is true that at the resource level, the technology of the digital age contributes to an environmental and social disaster. Initiatives such as the *fairphone* or the fair mouse just reveal how difficult it is to actually achieve a fair and ecological production of things as "simple" as a mouse for the computer. But how far are concepts such as the *(fully) automated production*, *smart cities*, *cryptocurrencies*, the *internet of things* or *big data* from forming part of degrowth utopias? And, on the other hand, what have actors and institutions related to degrowth (not) achieved in terms of getting control over the technology they use?

Technological autonomy and data ownership

> "If machines produce everything we need, the outcome will depend on how things are distributed. Everyone can enjoy a life of luxurious leisure if the machine-produced wealth is shared, or most people can end up miserably poor if the machine-owners successfully lobby against wealth redistribution. So far, the trend seems to be toward the second option, with technology driving ever-increasing inequality."
> – Stephen Hawking

Close to the concept of autonomy of Castoriadis, one can identify in Illich an approach to technology where the focus is on the institutional model and way of distribution, rather than being critical on technology per se (although he's usually perceived as being strongly anti-technology). Pushing on criticism towards a centralized approach to distribution of learning content, Illich explains how with the same amount of money invested on building up a TV broadcast for state and corporate controlled contents, could be replaced by a tape recorders network, allowing a much larger group both not only to receive, but also to produce and disseminate information.

These dimensions of democracy and justice have been subjected to strong debate among some of

the main references of the degrowth movement: these converge on the importance of having access technology and the capacity to understand and use the technology without resorting to huge institutions (nowadays mostly corporations). One can see such concerns shared by Richard Stallman, the open source guru (GNU Foundation) mentioned on last years' Chaos Communication Congress (the largest hackers congress in Europe) that "teaching children to use proprietary software is like teaching them to smoke".

Collective ownership of technical infrastructures and data, interoperability, linked open data (LOD), and the semantic web with its vocabularies and ontologies are some words that are expected to appear more and more in the discourses engaged in building up postgrowth futures. As Silke Helfrich mentioned at the recent international solidarity economy congress (Solikon) in Berlin, "if you control the infrastructures of production, you don't need certification". It is hard to imagine that Ivan Illich would not feel excited about the convivial, deschooling and deinstitutionalization potential of the world wide web and an underlying commons infrastructure.

"Proudly invented elsewhere"

Addressing the accumulation and appropriation of big data (the new capital) by corporations and states, linked open data may contribute to a world of massively scaled small data hosted on a federated commons cloud.

The technology for deploying such an infrastructure is available now and at the software level it is even open. But what institutional settings could support such a cloud infrastructure to be largely deployed and to overcome Facebook, Google or Condoleeza's Dropbox?

This issues are being targeted by movements associated to and emerging from the free software culture. More recently, with the dissemination of initiatives around Open Source Ecology or the FabLabs, the resource aspect has been approached. Bauwens talks about the new wave of global thought and local production - knowledge is shared across all parts, while production is localized. He uses the example of a tractor, built with parts that can be built by anyone and which building schemes are available for general use. Community networks supported by wireless (open source) technology such as the Freifunk initiative contribute to a grassroots development of "mesh networks" and directly contribute to distribute ownership of internet infrastructure. The low cost Raspberry Pi, among other "smart devices" can then serve, for example by installing the "FreedomBox" software, for having an own cloud and server for as low as 30 €, consuming around 10 W and fitting in the palm of the hands.

The idea of commons has been particularly prolific in the digital sphere. The movements and development behind Free/Libre and Open Source Software (FLOSS) has been able to generate the largest encyclopedia ever created, putting the *Encyclopedia Britannica* out of business in a few years. The Linux Kernel, has been released by the Finnish student Linus Torvalds in 1991 and consists today of over 18 million lines of source code under a license (GNU Public License or GPL) that prohibits any commercial usage of it. It's success was so immense that most of the world wide web, as well as a huge number consumer devices - from Android smartphones, to TomTom GPS - are built on top of the Linux Kernel.

Reshaping production and consumption

Today we observe the emergence of new patterns of production and consumption of technology. Social-technological innovations, rather than pure technological innovations, seem to be the dominant pattern of innovation. Code development and recombination "factories", such as the famous GitHub have become social networks for a global sharing of digital production. At the hardware level, FabLabs, Repair Cafés or Open Source Ecology are sharing their knowledge globally, based on their accumulated experiences while articulating production and learning with their local communities (of practice).

Startups and the so-called unicorns (startups with value over 1 billion euros) are shaping the business landscape, while tensions on the appropriation of terms emerging from the grassroots, such as sharing economy, open up new tensions and spaces of debate in society. These businesses share the feature of not owning a single piece of the means of production: they just provide closed and commercial platforms, digital marketplaces which abruptly reduce transaction costs and allow for individuals to engage in peer to peer economic relationships with a global crowd of consumers. It is not about sharing, but rather increasing the economic efficiency associated to the use of resources they "own", be it their cars or their houses.

Nevertheless, the developments and new modes of production and consumption being pushed by the so-called Sharing Economy provide interesting insights into the degrowth debate. As Maurie Cohen recently wrote, "the antagonism between producers and consumers that is inherent in predominant systems of exchange frequently results in consumption in excess of genuine needs – often through the use of tempting volume discounts and the manufacture of goods that become prematurely obsolete." As such, rather than completely dismissing the patterns of exchange of the sharing economy, Cohen argues that through the development of "reciprocal relationships, producer-consumer cooperatives could bring the intentions of production and consumption into closer alignment". The challenge would be to develop a "more efficacious sharing economy" capable of constraining the "expansion of mediated micro-entrepreneurship and serialized rental in favor of modes consistent with communitarian provisioning".

Cohen speaks about platform cooperativism as an alternative. The praxis of the collectives on this is one of engaging in collective and federated production processes. As an example, the TransforMap project, an initiative involving dozens of networks, NGOs and initiatives worldwide, aiming at building up the "mother of many maps" for the alternative economies, combines network and community building, agile development practices (scrum) with events such as mapping jams, hackathons and (geo)vocamps, for developing a technological stack that is capable of providing meaning and use for the diversel of narratives and movements emerging as a response to the limits of growth and the current multiple crises.

What next?

A growing number of collectives worldwide are similarly working on recombining and further

developing the existing free software into stacks that provide a more democratic access to services, shaped to needs and uses of the target communities. A few example projects with relevance to the challenges addressed by the degrowth movement are worth mentioning here (as indication only, as many more potentially relevant projects are out there):

- Social networking and collaboration platforms such as wachstumswende.de (Django-based closed source) or co-munity.net (Drupal based, open source) are supporting the networking efforts of the movement outside of the corporate services of Facebook or Dropbox;
- The French collective Framadate is rebranding and facilitating the access to free software as alternative to conventionally used corporate services such as Doodle or Google Drive;
- The FP7 funded FiWARE consortium is trying to build distributed cloud infrastructure based on OpenStack;
- The p2pvalue consortium is attempting to index and analyse projects related to commons-based peer production and create
- The German-based collectives Ecobytes e. V. and Allmende.io are networking with a range of hackers and collaborative economy collectives, as well as networks such as Solidarische Landwirtschaft and Degrowth, to conceptualize and implement a federated commons cloud (federated.cc).

A particular interesting fund has been recently launched by the EU, to support "collective awareness platforms for sustainability and social innovation" (CAPSSI). Far from being a top-down research project, the fund specifically recognises the contribution of hacker communities and grassroots movements and is putting major efforts in networking these actors to build pilot platforms.

And here lies the big challenge for researchers and action-researchers on technology and degrowth: while it is desirable for researchers to engage in the actual production of (free and open) technology, it is simultaneously important for these to combine with existing efforts coming from the DIY, hackers and other grassroots movements. The technology is there, but building up a solid social-technological development aimed at creating the underlying infrastructures and processes supporting a transition towards, or compatible with a postgrowth society, asks for more resources from different sides.

Making research projects to accumulate even more knowledge on how things work or should work is really not the interesting thing to do today. We rather need more (participatory) action-research in the field, capable of bringing scientists - also non-technical ones - to the collaborative development of platforms, onthologies and vocabularies for data openness and interoperability. Supporting events such as hackathons, or using (and supporting) commons server infrastructure and free software services are examples of actions that support the transformations and resistances happening in the field of technology and the digital commons.

Note: further readings and references will be provided shortly after the workshop.