Ontological Disobedience in the Age of Tinkering: Crowdsourcing Data or Hacking Hardware?

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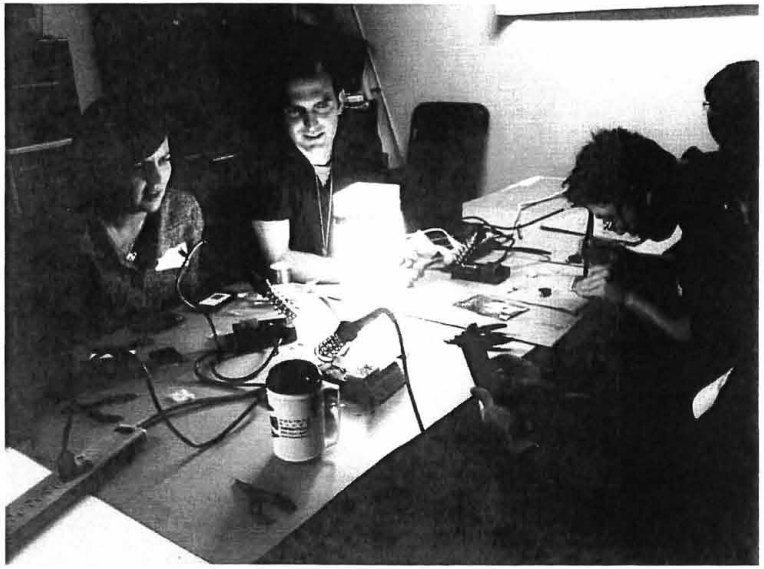

Tinkering with hardware and data in recent years is supported by developments in distributed and social computing, design trends in social networking and gamification, social movements, such as "quantified self" an DIY and maker communities, but also aesthetic and cultural trends, such as the interest in visualizations, crowdsourcing, crowdfunding and open source initiatives. While the data oriented projects tend to embrace some notion of collective intelligence and crowdsourcing, the hardware oriented projects demand more in terms of the individual efforts of the citizens. They target niche communities formed around building and hacking tools in a DIY and open source manner.

On one side we have projects involving screensavers for crunching data and sharing computer power, such as SETI@home and Folding@home, or some basic cognitive operations in the form of so called Human Intelligence Tasks and Amazon Turk type of applications (GridRepublic), which reduce complex tasks into simple operations of sorting, tagging, observing etc. This type of "digital" Fordism and its data "assembly line" reduces citizens to very passive and automatic, semi-intelligent machines, which offer their computers and brains for a type of community service in science. It differs from more demanding initiatives around data, such as collective visualization and sharing of datasets over Many Eyes IBM or Kaggle, in which citizens are challenged to collect, interpret and discuss data or even compete against experts in some research.

On the other side we are starting to witness projects involving citizens in maker and DIY activities related to hardware, such as building laboratory gadgets and tools in the Hackteria projects (DIY Microscopy, DIY Micro Dispensing and Bio Printing), Maker magazine and Maker Fair communities, and many workshops in various Hackerspaces for soldering (Noisebridge). The tension between these two opposite sides of data and hardware hacking activities is often bridged in the case of participatory environmental monitoring and distributed environmental sensing projects, such as Common Sense Project, BioWeatherMap , SciStarter, Kanarci etc. and recent post-Fukushima Geiger counters hacking efforts in Japan (Safecast). These projects involve not only gathering of data but also knowledge how to operate and hack various sensors.

Citizen science projects working with data (very often from astronomy, ecology, and health) gained a lot of attention and recognition in recent years for its supposed democratization of science and involvement of citizens in the research process as a form of public participation and popularization. However, it also created a certain illusion that collective intelligence will solve all world problems and that it is enough to just gather and crunch large amounts of data to become a good citizen. In this respect, the more demanding hardware hacking initiatives offer a more radical and critical approach. The niche communities formed around 3D printers, low tech lab gadgets and around building low tech tools for environmental monitoring and sensing, various DIYbio hacking activities etc. involve citizens in more complex cognitive operations demanding certain skills but also humility. The global Hackerspace movement or similar communities, such as Hackteria and HONF, and even new university driven projects involving communities interested in building low tech lab equipment for developing countries (CellScope, Tekla Labs, Seeding Labs) present a new trend in hardware and maker oriented citizen science projects. They allow us to witness the weaknesses and imperfections of various scientific tools and methods rather than take part in the

mysterious collective intelligence, which is able to embrace information emerging from the chaos of data. This individual, messy involvement with materiality and with various limits of technology and scientific knowledge by hacking tools and experiencing various problems with even simple science protocols give a more realistic experience of science. Citizen science projects related to low tech, open source hardware hacking (projects such as InMojo or Safecast) and DIYbio protocols create a more critical understanding of how science works in practice and how data relate to tools and measurements. The messiness and materiality behind data, issues with calibration, precision, complex conditions surrounding every experiment are better lessons for amateurs and enthusiasts to master before they can understand, participate and asses science.

The hidden tension between data and hardware driven citizen science projects touches upon important issue of how awareness and knowledge relate to embodiment and practice and how collective intelligence relates to various social, economic and other conditions, which often decide on the research and even its results. True democratization and participation in science and technology need to involve this more critical experience and assessment of the practices of science rather than dwell on metaphysical notions of emergent patterns and intelligence behind data liberated from human agency. Another problem with data driven projects is the impression they make that they are targeting new discoveries, while hardware and DIYbio hacking seem only to reproduce banal protocols by cheaper means and to re-create already existing tools from the market. The low tech focus helps us understand the processes of these discoveries back to its basic tools and conditions, in which they appear. It also opens the research process to people in the developing countries, which are not commonly involved in the data driven projects. Furthermore, they not only popularize and make science cool, but help everyone to understand the limits and problems of various experiments, technologies and protocols, and to appreciate them even when they do not yield immediate and crowdsourced results.

Hardware driven projects as well as data crowdsourcing are means of what Steven Woolgar, an important philosopher and sociologist of science and technology, calls "ontological disobedience". Ontological disobedience is synonyms with individual freedom and social innovation in an age when we need to take into account the technological conditions of every process, action, and event. It is a form of perpetual rebellion against social and other conventions in the name of probing their conditions, limits and possibilities, which are often technical and economic. Woolgar's ontological disobedience is a rather reflective activity and attitude, and what we are starting to witness with these hardware hacking is that it can also involve creating, making, breaking and being involved with various ontologies and things outside of our human agency and will. Not only individual reflection, but also open and collective design and prototyping can become means of ontological disobedience, where the scientific, technical, biological and social are being "disobedient" at the same time. Ontological disobedience simply means that we test different configurations and relations between people, molecules, traditions, tools and norms, and we reach consensus by experimenting with people, data and hardware at the same time.

Links

Amazon Turk https://www.mturk.com
BioWeatherMap http://bioweathermap.org/
Common Sense Project http://www.urban-atmospheres.net/CitizenScience
DIYbio http://diybio.org/
Fablabs http://fab.cba.mit.edu
Folding@home http://folding.stanford.edu/
GridRepublic http://www.gridrepublic.org/
Hackerspaces http://hackerspaces.org
InMojo http://www.inmojo.com/
Kaggle http://www.kaggle.com/
Kanarci http://kanarci.cz/
Make http://makezine.com
Many Eyes IBM http://www-958.ibm.com/software/data/cognos/manyeyes
Safecast http://blog.safecast.org/
SciStarter http://www.scistarter.com/
SeedingLabs http://seedinglabs.org/
SETI@home http://setiathome.berkeley.edu
Safecast http://blog.safecast.org/
TeklaLabs http://www.teklalabs.org

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Short bio: Food "hacker" with interest in networking over body data (SNPs, fMRI) and kitchen open source hardware. Works at the National University of Singapore, member of the global biohacker organization, Hackteria.org, and Prague based Hackerspace, Brmlab.cz. Follows and supports Singapore Hackerspace and Indonesian citizen science and art initiatives, LifePatch and HONF. In the present, she works on a book about design and policy in relation to the Hackerpsace movement.