
#26co-session
SELF SUFFICIENT LABS
JULY 15th 2016
Organized by:
co-society
In collaboration with:
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SELF-SUFFICIENCY:

EXPLORING THE CIRCULAR ECONOMY AS A BUSINESS OPPORTUNITY

The concept of self-sufficiency is currently spreading to diverse fields: industry, energy, food production, education, economy... new ways to manufacture, raise crops, or produce energy appear thanks to the emergence and speedy development of disruptive technologies and our need for more sustainable production and consumption models. New opportunities are on the horizon for those companies capable of responding to these new demands and adapting and adopting their business models accordingly.

To become more familiar with the concept of self-sufficiency and interact with some of the relevant technology, we held our Co-Session #26 in **GREEN FABLAB Valldaura**, an old Catalan farmhouse located in the Collserola forest that is now converted into a project laboratory focused on making reality their vision for a self-sufficient Barcelona. This was made immediately apparent in the first presentation of case studies of companies and start-ups that are already innovating to offer new value proposals and respond to the opportunities popping up in areas such as product self-fabrication, food production in the home or urban areas, the possibility to live off the grid disconnected from traditional electrical networks or the potential of life-long self-training without actually stepping into a school or on a university campus.

New opportunities are on the horizon for companies responding to the need of more sustainable production and consumption ways and adapting and adopting their business models accordingly.

BLOCKCHAIN AND BITCOIN: NEW MONEY FOR A NEW ECONOMY

The emergence of new kinds of currency finds is roots in the ideals of self-sufficiency and self-organization. In fact, **blockchain**, the technology that supports and makes **Bitcoin** possible, is believed by many experts to be the next great disruption in many areas, since it can function without a centralized registry controlled by "the competent authorities". For this reason, in this Co-Session about self-sufficiency we spent time learning about blockchain, Bitcoin, and other alternatives to official currencies in order to better understand how they work and what the potential consequences could be.

As Pep Lluís de la Rosa, one of Spain's leading experts in virtual currency, explained- money is based on trust. For a currency to work, one must be sure that accepting a piece of paper or abiding by a note placed on a bank ledger guarantees that this symbol can be exchanged for real and tangible value. Power- starting with kings, emperors and then governments- has been built on money deposited and guaranteed exclusively on this basis of trust. Blockchain broke this monopoly, making it possible for any organization or company; city, village or neighborhood; or simply a group of people in agreement, to now create and use their own currency in a safe and efficient way.

Blockchain breaks the monopoly of trust guaranteed until now exclusively by kings first and states later, making now possible for any organization to create and use their own currency in a safe way.

ENERGY WORKSHOP

We knew that alternative energy sources are especially suited for achieving energetic self-sufficiency; about the sun's rays caught by solar panels or breezes capable of moving the blades of a small windmill. However, many of us learned for the first time in this Co-Session that it is also possible to obtain energy from the soil where plants are being grown. We did it ourselves in a hands-on workshop where we built our own electricity-generating pot. This pot was also designed to be self-fabricated on site using adjustable pieces "cut out" with a laser cutter and a thin wooden board.

The functionality of this pot-battery is based on research from 2007 and referred to as **Plant-e Technology**, currently in the experimentation and improvement phase. During the photosynthesis process, plants use their root system to deposit up to 60% of the energy they produce into the soil. By applying the concept of biological cell combustion, it is possible to convert part of this energy into electricity via microbial action. The energy generated by this innovative discovery is still minimal, about 0.4 W/m2, but ongoing research indicates it could be up to four times higher in the future. Improvements to this technology would make it possible, for instance, for vertical gardens hanging on building facades to not only act as insulation but also as a self-sufficient source of energy.

FABRICATION WORKSHOP

Self-fabricated products create a special bond with their producer/consumer. If it stops working, it is much more probable to be fixed instead of just buying a replacement.

GREEN FABLAB Valldaura is working on a project, together with the **Park of Collserola** where it is located, and the forestry services company **Social Forest**, experimenting with geolocalization to trace wood procurement from the origin, starting with the tree itself. Valldaura uses lumber cut from its own land to self-fabricate furniture designed and customized under the tag Open Source Furniture.

Today, every product starts out as a digital design. Furniture designed in open source can be freely used and modified. Self-fabrication doesn't only mean that each product, in this case each piece of furniture, can be customized. We learned that self-fabrication also means that the logic of mass production changes and it shows us how cities can avoid being "product importers and waste exporters" and instead become more self-sufficient. Self-fabricated products also create a special bond with their producer/consumer. When an item you have created stops working, it is much simpler, and much more probable, that you will fix it, rather than buying a replacement. This also means that self-fabricated consumer items result in higher sustainability.

AUGMENTED REALITY WORKSHOP

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Self-sufficiency, the idea that you can build anything yourself, can also be applied to the most advanced technology, such as augmented reality and virtual reality. We were able to test this out at a workshop showing us a practical way to experiment with these technologies using a simple, DIY VR (virtual reality) visor made from cardboard or wood. Or even the relative ease with which you can use something like Unity, an open source software and platform, to design and share models of augmented and virtual reality.

We also learned that making available this type of technology and access to VR models for designers and all kinds of "makers" allows them to work on their designs and projects in a more sustainable way, conserving, for instance, CO_2 from unnecessary trips or reducing building materials destined to prototypes, maps, models, trials, etc

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PRECISION AGRICULTURE AND SUSTAINABLE BEEKEEPING:

=DATA IS KEY=

Valldaura partially recuperates its farming history with its initiative to grow crops on some of their fields surrounding the old farmhouse; this is part of a project on collaborative and precision agriculture. We were able to witness how data generation is a fundamental raw material on these fields. Valldaura uses a series of volunteers and QR codes to track the environmental footprint of their small farm, including the people that have worked on it and in what way, for each kind of fruit and vegetable.

Valldaura is also a promoter of **Open Source Beehives**, an international collaborative project using Open Hardware & Data whose goal is to experiment with different beehives and beekeeping methods to find the healthiest model for bees. Absolutely necessary for pollination, the honey bee population has fallen dramatically worldwide. Here they are using specially designed, open source, DIY beehives built with advanced sensors and highly sensitive microphones that give information about the behavior of their more than 80,000 honey bees, all within the context of a sustainable and self-sufficient beekeeping farm.

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www.co-society.com
info@co-society.com