DiY / Do-It-Yourself Workshop
"Hack Your Food"

FOOD2030 high-level event, European Commission
12th October 2016, Brussels

Organized by

EU Policy Lab / Foresight, Behavioural Insights and Design for Policy Unit (Joint Research Centre, European Commission) & Waag Society

Facilitators
Pieter van Boheemen (Waag Society) / @pietervboheemen
Iris de Vries (Waag Society)
Susana Nascimento (EU Policy Lab, JRC.I.2) / @sfnohohon
Alexandre Pólvora (EU Policy Lab, JRC.I.1) / @discomplex

Social media aggregated posts: https://storify.com/sfnohohon/food2030-diy-ws

Joint
Research
Centre

Context

The European Commission organized the high-level conference FOOD2030 on 13th October in Brussels, addressing the future food strategy for Europe. The previous day was dedicated to parallel workshops focusing on specific challenges of such food strategy. In this context, the EU Policy Lab / Foresight, Behavioural Insights and Design for Policy Unit of the Joint Research Centre (JRC), European Commission, co-organised with the Waag Society a Do-It-Yourself (DiY) workshop on emerging hacking practices in the food area. The intended audience consisted of researchers, policy makers, innovators, industry and NGOs representatives. The workshop took into account the level of science literacy and appreciation for food and agriculture while exposing participants to new DiY science, citizen science and biohacking approaches. The workshop intended to be a hands-on opportunity to widen their perspectives on such practices.

EU Policy Lab was established in June 2014 within the Foresight, Behavioural Insights and Design For Policy Unit of the Joint Research Centre (JRC), European Commission. It is a collaborative and experimental space that aims to envision, connect, and prototype policy solutions to tackle current and upcoming EU challenges. Its main goals are to contribute to innovation in public policies within the Commission in offering a safe space that is well connected with existing innovation capacities in Europe and in the world; to focus on the combination of three major competences (foresight/anticipation, behavioural sciences and design thinking) to develop new integrated responses, processes and tools; and to be both a physical space and a way of working to enable experimentation, collaboration and sharing.

Waag Society - Institute for Art, Science and Technology—is a pioneer in the field of digital media. Over the past 22 years, the foundation has developed into an institution of international stature, a platform for artistic research and experimentation, and has become both a catalyst for events and a breeding ground for cultural and social innovation. Waag Society has over 16 years of experience in developing creative technologies for social innovation. "Users as Designers" is the main design philosophy of Waag Society, where artists, creative and users have a strong influence on the final results. In their vision, by involving prospective users in the design process, the results are likely to bring better results and that adoption and appropriation of the results become far more likely than by using traditional methods of development.

Aim and objectives

The rise of Do-It-Yourself, or rather Do-It-Together (DIT), science practices by citizens has opened new perspectives on their role in food security. Both in terms of the accessibility to food and in how citizens can retake agency through the appropriation of tools that were the exclusive domain of governmental organizations, industry and research institutes. This workshop showed how individuals can create their own microalgae reactor, inspect and determine the quality of a harvest and prepare a healthy algae smoothie. All using a combination of tools and off-the-shelve parts that can be made in FabLabs, Makerspaces and/or Hackerspaces based on Open Source designs. Participants discussed how these practices may change the relationship

between stakeholders, the way (eco)-systems are designed around food and how citizens can be engaged in this debate.

The workshop was at the intersection of two ongoing EU Coordination and Support Actions, namely "Do It Together Science" (DITOs) and "BigPicnic". Both projects are focussing on scientific outreach and public engagement. The workshop gave the participants some insights in the mechanisms that are used to gain this engagement. This encompasses a combination of "biohacking" and "DiY food" approaches translated towards an audience that consisted mostly of researchers, policy makers, industry, innovators and NGOs. Participants learned how the general public can be engaged in urgent topics such as "food security".

Workshop introduction

The workshop participants were challenged to think and act like citizen scientists and stimulated to include new perspectives throughout the workshop as a combination of co-creation training and hands-on experimentation. The Waag team introduced the characteristics of this approach, which is rooted in iterative design, rapid prototyping and collaborative and open design thinking (see presentation in PDF format).

Waag Society's presentation on "Hack Your Food"

Participants were divided randomly in four groups, considering all activities were planned to be executed collectively within a learning-by-doing rationale. To start off the discussion within the groups, participants were asked to think about the meal they had that day (lunch) and try to define it according to basic criteria. These criteria were proposed by participants themselves, including for instance taste, smell, look, ethics, origin, etc., and drawn as a circle in each group's flipchart. The "meal" was placed at the center and positive/negative connections were then drawn between the different criteria. This exercise triggered initial discussions between participants about their own everyday perceptions of food, followed by a plenary discussion on how DiY practices could potentially change those same perceptions and, more generally, current food systems of production, circulation and consumption.

Initial group discussions

Hands-on activities and outputs

The second part of the workshop was dedicated to prototype an actual DiY device, and to discuss bottom-up citizens led protein production. The assigned task was for each group to build their own photobioreactor with the aim to grow Spirulina, which is a cyanobacterium that can be consumed by humans and other animals. Basically it is a green microbe now being used as a nutrition source or a dietary supplement. It is considered by some as a complete protein and a source of numerous nutrients, particularly B vitamins and minerals, such as iron and manganese.

As a crucial part of the workshop's hands-on approach, participants in groups were given the challenge (and necessary materials) in one afternoon to:

• assemble a DiY photobioreactor together with its electronic components;
• prepare growth conditions for spirulina (in terms of temperature, nutrients, pH, light, atmosphere);
• analyse medium and sample (for future reference, using for instance the Open Source BioHack kit developed by Waag Society in the BioHack Academy)
• make tasty smoothies (one teaspoon of spirulina powder provided by the team, and mixed with sweet flavours, fruit or chocolate).

The DiY photobioreactor was designed by the Waag Society to control or monitor a specific set of parameters - amount of light based on a day / night cycle; pH;

temperature – and display the values on an LCD screen. In order to build the DiY photobioreactor, each group was given:

- Foldable cardboard (pre-cut in a lasercutter) and a plastic bottle (as container to grow spirulina);
- Electronics components: Arduino Leonardo, breadboard, relay board, LCD screen (panel already soldered to the back of the screen), digital light sensor and pH sensor;
- Set of assembly instructions (see instructions in PDF format).
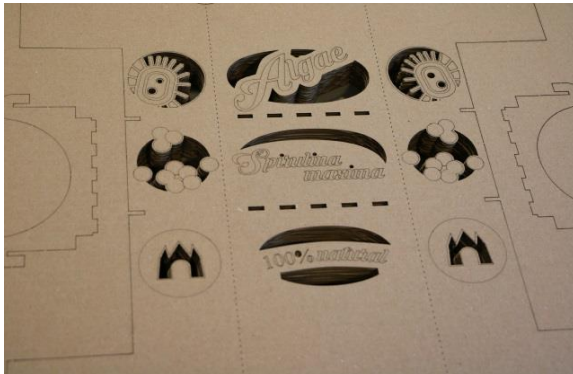
Assembling the foldable cardboard
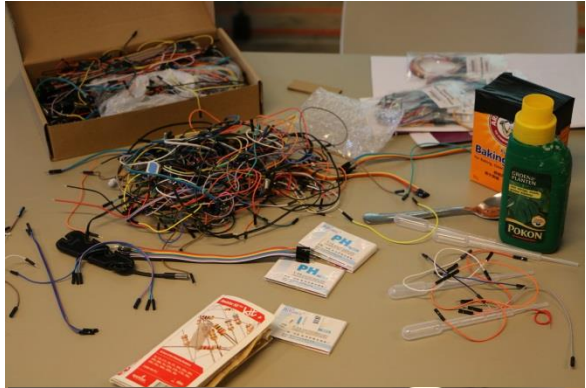
Participants assembling DiY photobioreactors


Spirulina seen through a DiY microscope

Final tasting of a spirulina smoothie

Future reference

All the documentation of the DiY Workshop "Hack Your Food" is available online, allowing anyone to replicate and build their own photobioreactor and grown their own algae. You can find all necessary materials here, which includes for instance:

- Bill of Materials
- Arduino Code
- Fritzing wiring scheme
- DXF lasercut file (by Iris de Vries)
- Electronics Assembly guide
- Selected pictures

The documentation is made available under a GNU General Public License Version 3 ("Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed"). For future reference, please watch a video of a fully completed device here, and check out the photos bellow.
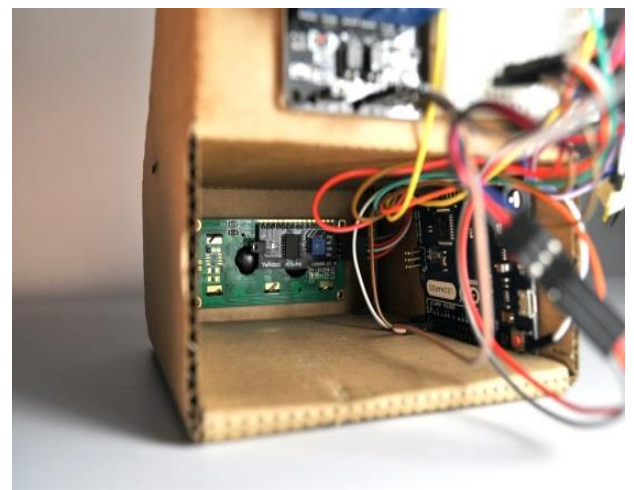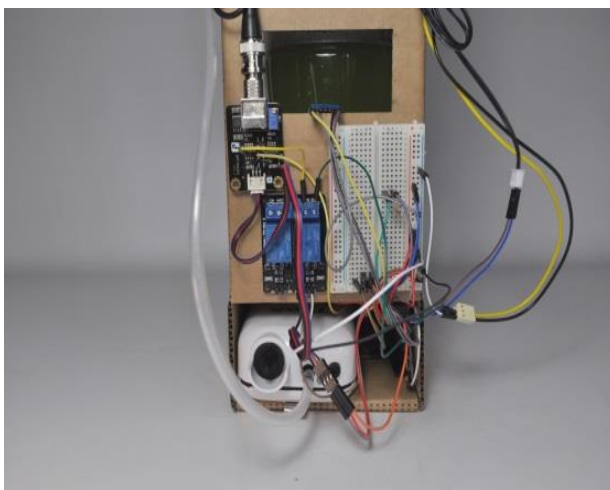
Details of assembled DiY photobioreactor
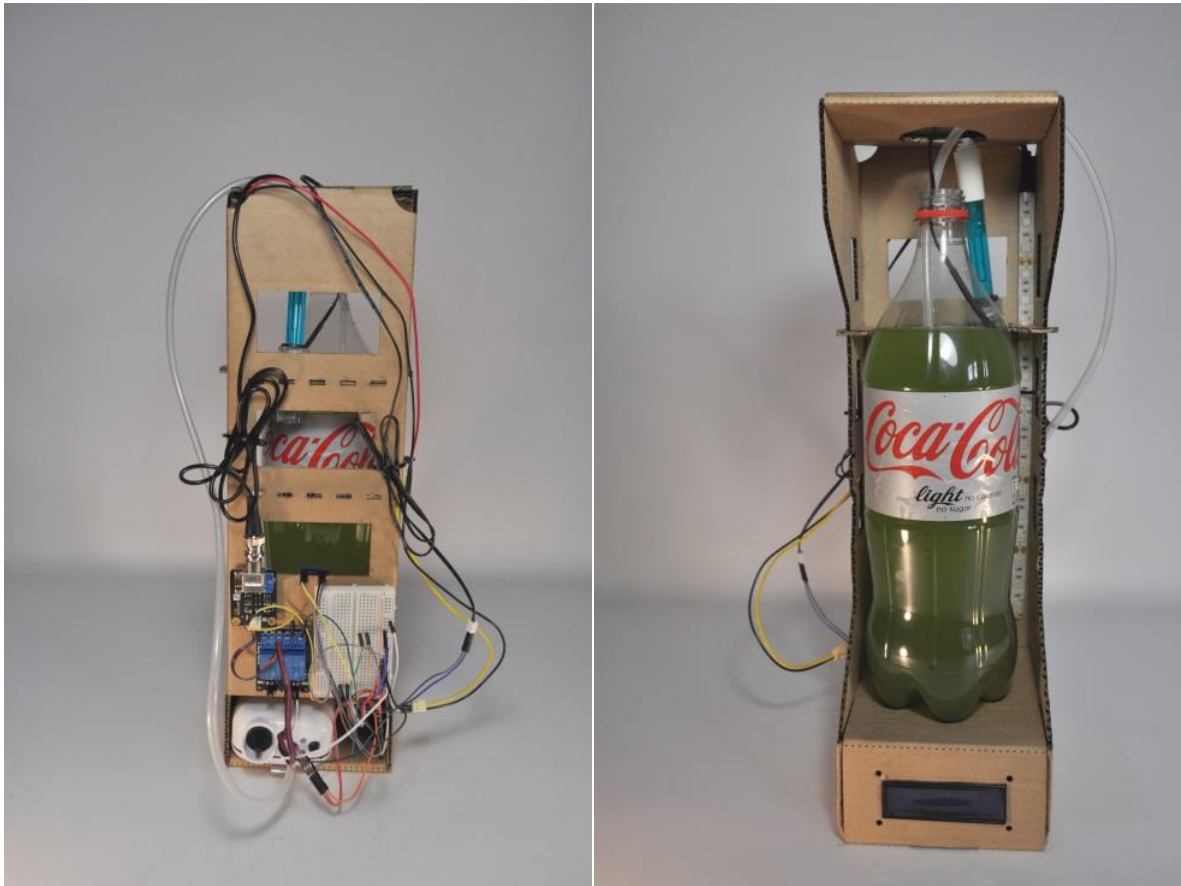
Assembled DiY photobioreactor

Acknowledgements