



# **sustainable fab labs**

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## Goals of Sustainability

- Balance dependency on grants, educational and government funding with growth in self-sustained funding.
- Nurture the Fab ecosystem with products, services and entrepreneurial enterprises, shared across the network of Fab Labs worldwide.
- Maintain the goals & values of the Fab Charter & community, retaining an emphasis on open access, open information sharing, and sharing ideas, tools, and interoperability.



## Fab Lab Sustainability Study

The group set out to observe current models & trends for sustainability in existing labs. The goal is to discover the secret sauce and traits that drive towards sustainability and then produce documentation and tools for all new and existing Fab Labs to leverage.

“One ideal model” is not expected to emerge from the study. A more likely outcome is a set of multiple blueprints, each with an underlying focus, that can point labs towards choices for sustainability.

This “on the ground” evidence and lessons learned from the labs is one facet of many in a larger effort to study Fab Lab sustainability.



## Noteworthy Patterns

- **Institutional Ties** – Fab Labs generally do not launch as independent, self-sustaining enterprises. Therefore, strong ties to community, educational, government and educational institutions were vital to launch a new lab.
- **Primary funder** – Reliance on one institution as a primary funding source accelerates a lab launch, yet creates challenges down the road.
- **Multiple Sources of Revenue** – Successful labs group together multiple revenue sources in order to meet budget. Unlikely to become sustainable purely on individual access fees.
- **Operating Costs** – Range from 30K to 120K+ euros annually, depending on amount of free personnel and rent.
- **Models in use** – Labs have been most successful in generating early revenue with “Education” & “Access” models. “Enabler” models emerge as Labs mature.



## Noteworthy Patterns

- **Diaspora** - Successful labs are asked to setup new labs, or stimulate the activity themselves.
- **Gradual growth** – Labs grows a machine at a time, as funding is available.
- **Personnel** - Lab leadership continuously short on time, . Pulling in community resources (interns, students, super-users,, local teachers) to distribute responsibilities frees up the leadership. Trading coverage for access time is common.
- **Usage patterns** – Mixture of students, founders, teachers, local professionals, industry.
- **Paying Community Users** – Artists, architects, entrepreneurs.



## Noteworthy Patterns

- **Types of Products**- Labs products are currently mostly structural, and a common theme we see across labs is the perception that the future is in “electronics.” Common product themes in electronics include sensors and energy-related projects.
- **Entrepreneurs** using the lab seek resources or “hands-on” partner(s) to help them “operate the lab” to evolve their designs and turn ideas into products.
- **Enterprises** - Labs are generally involved in entrepreneurial enterprises in one of three ways –
  - As a business incubator that promotes startups and acts as a consolidator and conduit for funding to do so.
  - Receiving hourly and other types of fees from startups using the lab platform.
  - Operating product businesses under the banner of the Lab, often with individual entrepreneurs.



## User Communities

- **Public & Private School Children.** It has been noted that it is helpful for young girls to have access to the lab without their male peers.
- **University Students.**
- **Entrepreneurs.** Includes both young inventors, business creators, as well as college / university students.
- **Artists / Crafters.**
- **Government / Corporate users.** Includes skill-building programs as well as targeted commercial projects.
- **General Public.**



## Fab Labs Interviewed

- **Barcelona, Spain : Institute for Advanced Architecture of Catalonia** – Imbedded in a school and sustainable through strong ties with government and nonprofit institutions, and high-profile “makers”.
- **Amersfoort, Netherlands** – Existing art collective added a Fab Lab and is sustainable through membership fees & interactive art shows.
- **Manchester, England** – Set out to become sustainable through ties with local industry – access & education.
- **Iceland** – Government-grant funded, both local & national.
- **Elyria, Ohio, USA : Lorraine County Community College** – Imbedded in a school. Multiple sources of grant funding. Funding and strong support for entrepreneurial efforts by students.
- **Nairobi, University of Nairobi Science and Technology Park** – Situated in a university environment, yet setup to primarily be a business incubator.
- **Soshanguve, South Africa** - Setup as a community lab funded by the government. Has grown to receive funding from local industry (notably BMW) and supports local startups with design and prototyping services.
- **www.Ponoco.com** – Distributed manufacturing exchange and marketplace. Sellers can promote products or product designs, and either manufacture, or assemble. Buyers can receive finished products, or make themselves.







# Sustainability models

(not mutually exclusive)

Currently

Grant-based

Institution  
Imbedded

Prototype Shop

## Proposed models

Access, Production

Hourly access, personal production, local production

Education

Workshops, training, degree certification

Enabler

Products & services to enable labs : software, installation & support, supply chain, curriculum

Incubator

Invention / business creation, individual entrepreneurs, joint ventures

Network

Leveraging the power of the Fab Lab network: multi-site invention, production, distribution.

## sustainability through new business creation: challenges

inventors are rarely entrepreneurs

entrepreneurs are not management teams

mentors are not substitutes for management teams

IP challenge for the lab to share in the upside

inventions cross wide variety of domains

inventions cross wide variety of regions

labs have very different capabilities

capital is rarely the limiting resource to sustainable business creation

