Digital Fabrication & Fablabs

What is Digital Fabrication?

- Wired magazine

WIRED

Technology

Digital fabrication is so much more than 3D printing

—

By **OLIVIA SOLON**

13 Mar 2013

- Foreign Affairs Paper

FOREIGN AFFAIRS

NOVEMBER/DECEMBER 2012

How to Make Almost Anything

The Digital Fabrication Revolution

Neil Gershenfeld

Scientific American 50

FP Top 100 Global Thinkers

What is a Fablab?

A Place filled with:
- Endless Delights
- Endless Possibilities
- Endless Fun

A Place where you can:
- DREAM it
- IMAGINE it
- MAKE it

A Place where you can...

The Fablab Network

- A Global network of more than 2700 Fablabs
- Started by MIT's Center for Bits & Atoms
- Open access workspace
- Standard inventory of digital manufacturing machines
- Principle 1: make (almost) anything
- Principle 2: make here --> make anywhere
- Fab Charter: sharing of knowledge & information
- Provide safe environment to explore & make

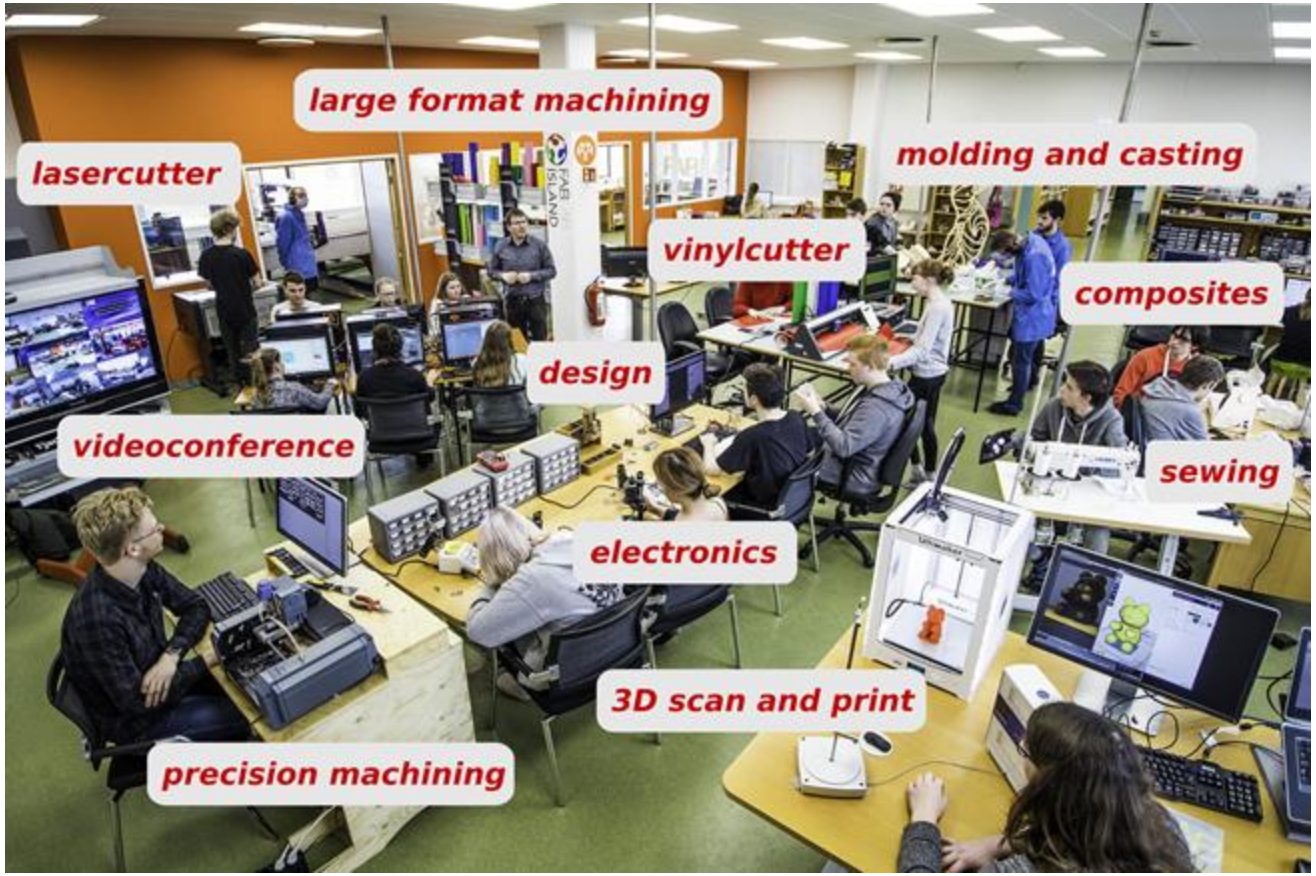
Neil Gershenfeld
Director of MIT's
Center for Bits & Atoms

Intellectual father of the Maker Movement

How To Make Almost Anything?

Chinese Master Carpenter Makes Toys for His Grandson With Skills Used to Build the Forbidden City

Carl Samson · September 28, 2020



Differences (from Traditional Methods)

- Traditional
  - Requires skilled craftsman
  - Slow, labour intensive
  - Not easily scalable
  - Changes requires rebuild

- Digital fabrication
  - Fast, convenient prototypes
  - Lowers barriers to product development
  - Easily scalable
  - Production ready prototypes
  - Easy path from prototype to production

Benefits of Digital Fabrication

- Pros
  - Computer assisted, saving time
  - Repeatability
  - Changes are easy
  - Personalized product
  - Localized production
  - Less wastage
  - Complex products don’t cost more
  - Faster than regular manufacturing methods
- Cons
  - No economies of scale, first product costs as much as 1,000th
  - Not beneficial for mass production
  - 3D printing takes longer
  - Machines require maintenance & consume power
  - Initial equipment cost

Benefits of Fablab/Digital Fabrication

What do people learn from using digital fabrication tools?

Fellow

by Erin Riley - Sat, 08/08/2015 - 20:39

- Develop multiple skills
- STEAM literacy
- Creative thinking
- Self-confidence
- Future-proof skills

Fablab SKILLS

- Tech Leaders & Specialists in DF
- 21st Century fabrication skills:
  - Web development
  - Computer Aided Design
  - 3D Printing & Scanning
  - Computer Controlled Cutting
  - 2D CNC Machining
  - 3D Precision Machining
  - Electronics Design & Production
  - Embedded Programming
  - Applications Programming
  - Internet of Things

Manufacturing

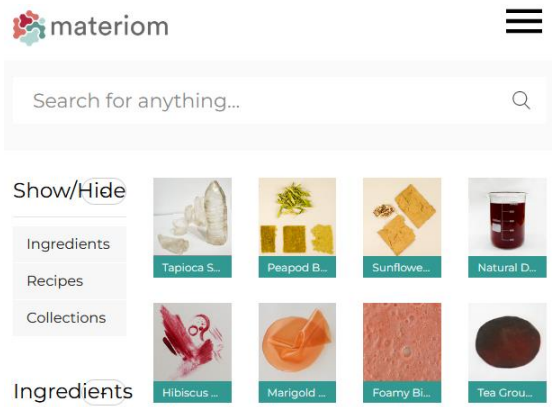
Precision Engineering

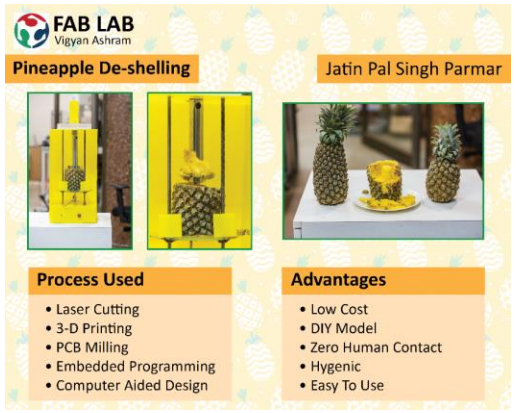
Electronics & Semiconductors

Telecomms & Industry 4.0

Architecture & Design

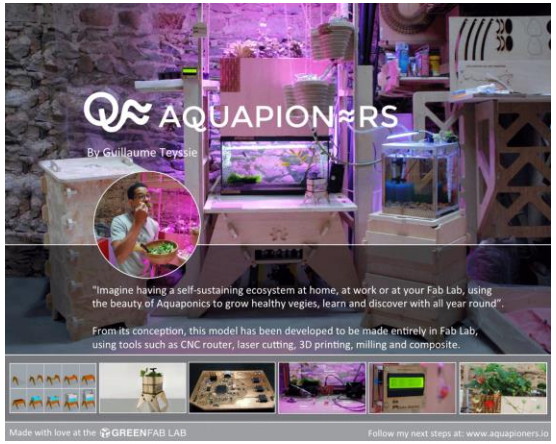
What Can You Make in a Fablab?





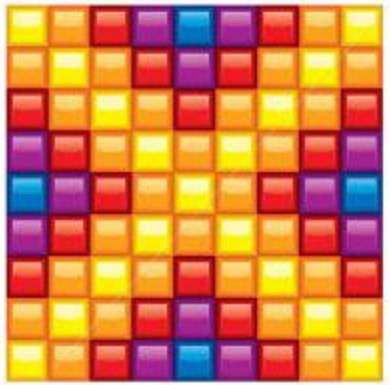
[Applications & Implications]

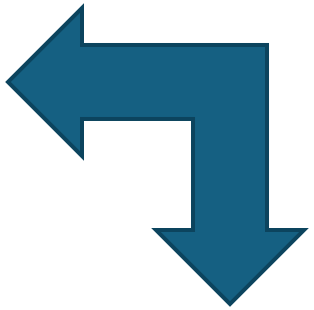
- [Medical]
- [Electronics]
- [Network]
- [Materials]
- [Machines]
- [Drones]
- [Microscope]
- [Environment]
- [Prosthetics]
- [Agriculture]
- [Houses]
- [Cities]
- etc



An Example of Digital Fabrication

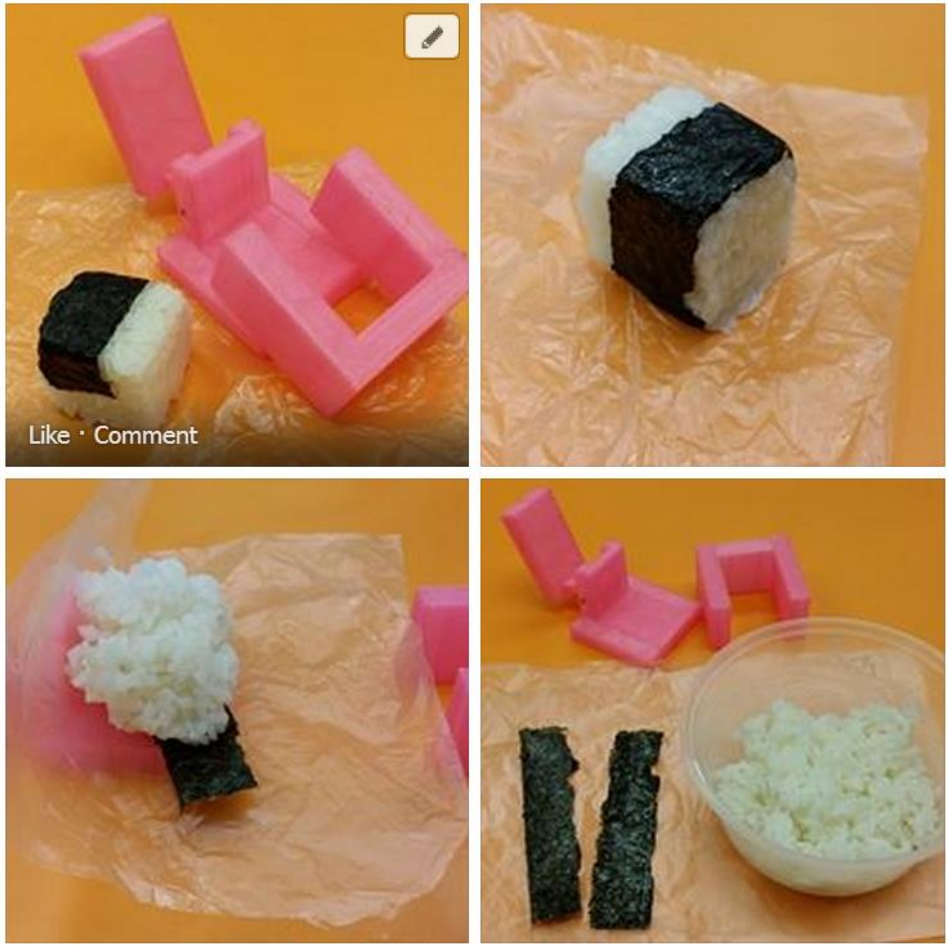
- Empathy/Define
  - Create new market for onigiri
  - Not cocktail party friendly
  - cheaper than better, better than cheaper.
- Ideate
  - Cube shape onigiri
  - Variety of fillings
  - Graphical arrangement
  - Marketing strategy





An Example of Digital Fabrication

- Prototype
  - Design 3D object using tinkercad/123D
  - 3D print the object
- Testing
  - Prototype
  - Confidence testing
  - Market acceptance



Details: https://www.facebook.com/sj.teo.9/media_set?set=a.809749252373660.1073741855.100000157784700&type=1

Cubariz http://www.thingiverse.com/thing:232874

Digital Fabrication is

- FUN
- Interesting
- Engaging
- Creativity
- Empowering
- Liberating