

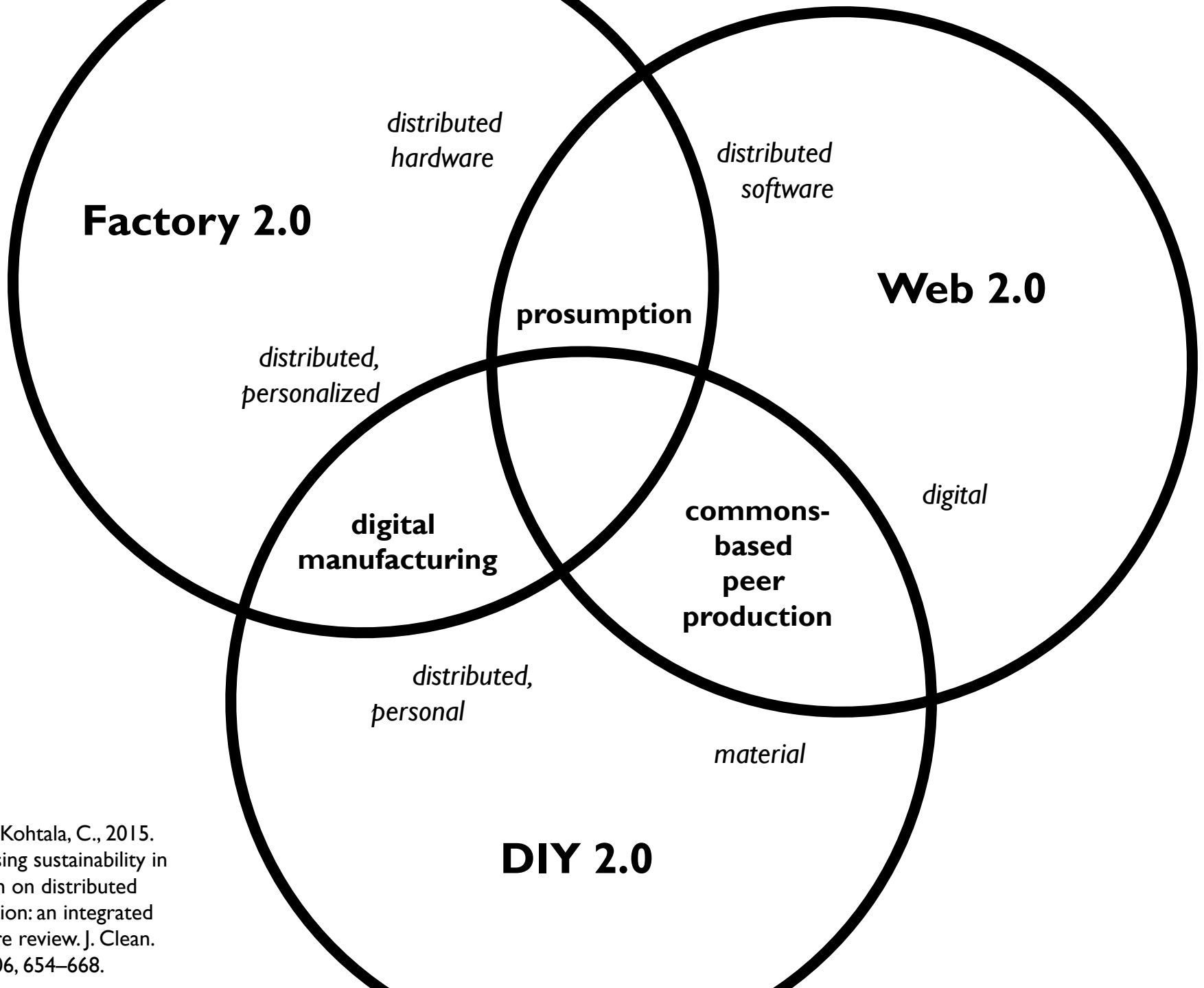
MAKERS

making sustainability

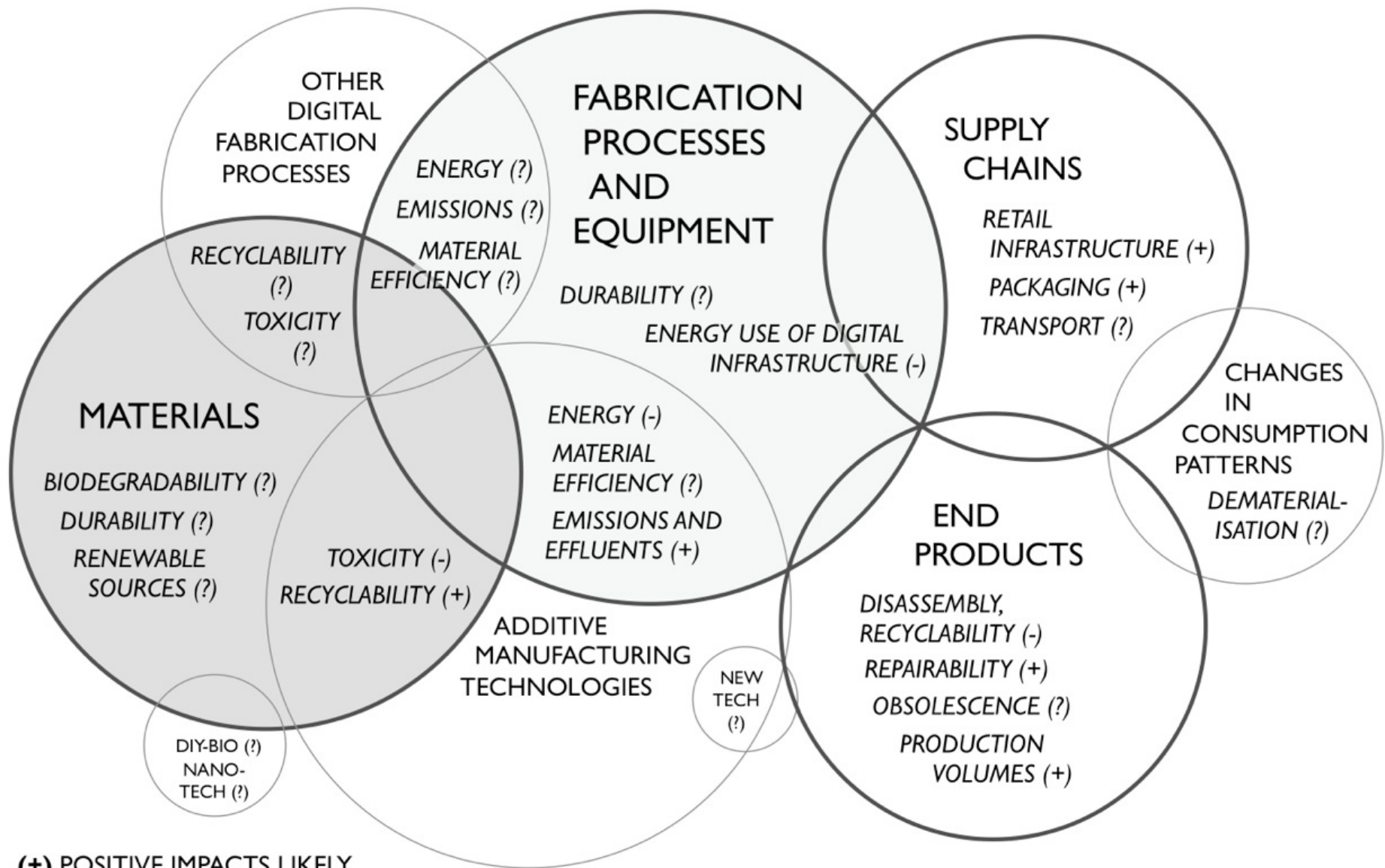
Cindy Kohtala
Postdoctoral Researcher
Aalto University, Finland

COWERK | Fab Lab Berlin | 25 October 2017
Workshops of Change: How innovation happens in
FabLabs, Makerspaces and RepairCafés





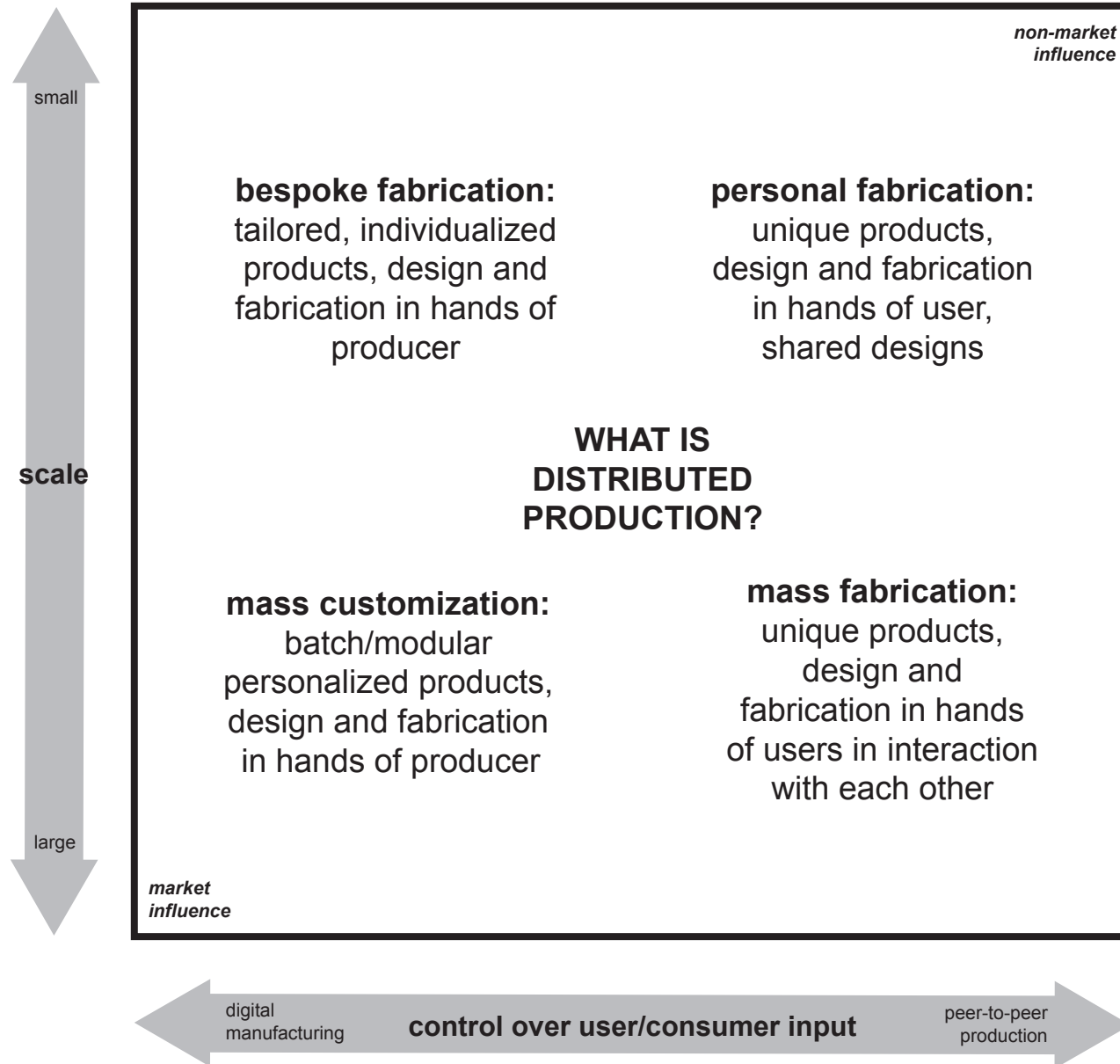
Source: Kohtala, C., 2015.
Addressing sustainability in
research on distributed
production: an integrated
literature review. J. Clean.
Prod. 106, 654–668.



(+) POSITIVE IMPACTS LIKELY

(-) NEGATIVE IMPACTS LIKELY

(?) INDETERMINATE (UNSTUDIED OR BOTH POSITIVE AND NEGATIVE)



SOURCE: Kohtala, C., 2015. Addressing sustainability in research on distributed production: an integrated literature review. *Journal of Cleaner Production* 106, 654–668.



Make:

Electronics Workshop Craft Science Home Art & Design

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3D Printed Car

The First Fully 3D Printed Driveable Car.



Amazing World Maker Faire Moments: See Slideshow

Check what you missed in New York.



You can build stuff for NASA!

Through contests and competitions, NASA gets the public involved.



WHAT'S HOT: Ultimaker Goes Global

By: **Caleb Kraft**

Ultimaker is now officially Designed in the Netherlands, Assembled in the USA. Ultimaker has long been seen as one of...

The new EAGLE
has landed...

Version 7

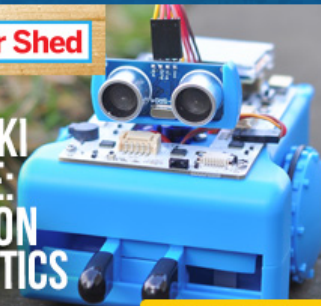
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More information:
www.cadsoftusa.com

Maker Shed

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MAKE:
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ROBOTICS
KIT



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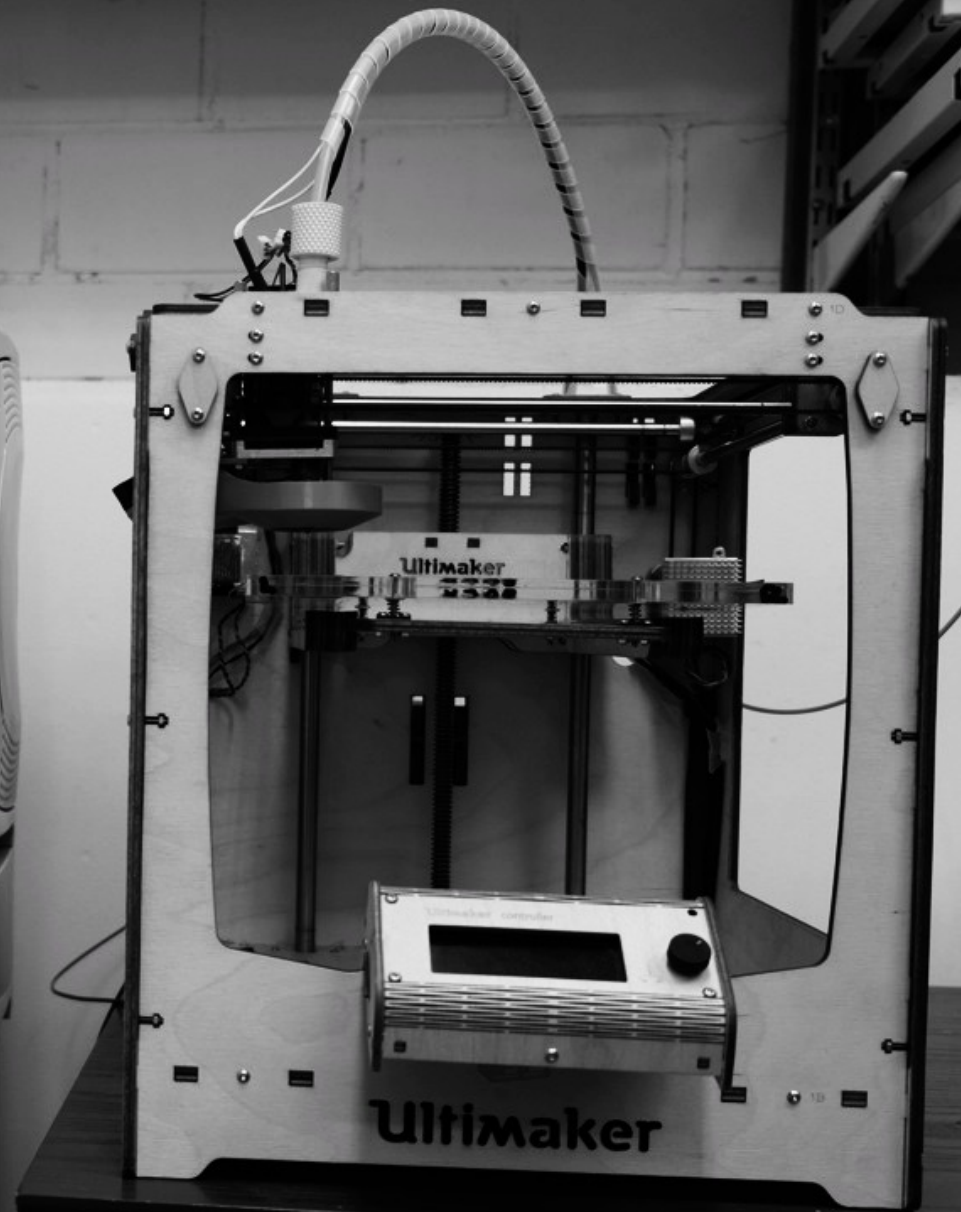


THESE ARE
SOCIOTECHNICAL
ASSEMBLAGES

of relevance. In line with Dewey and Lippmann, Marres points out that it should not be expected of a public to solve the issue that is in-the-making. The problem of relevance is a distributed problem, for the public, institutions, and others to care for. This is not simply done through talk or debate in political forums, but also through everyday practices such as when to turn on a washing machine or turn down the temperature in the house, what Marres (2012) describes as “material participation.” What characterizes this participation is that material entanglements in issues and public engagement cannot be separated. In other words, Marres argues that use, and other ways of living with technologies, are potentially modes of participation in public affairs. This argument also implies that we cannot simply position the political in certain spheres, separated from the private or activities such as making or doing. It also invites us to think of the everyday as an environment for participation.

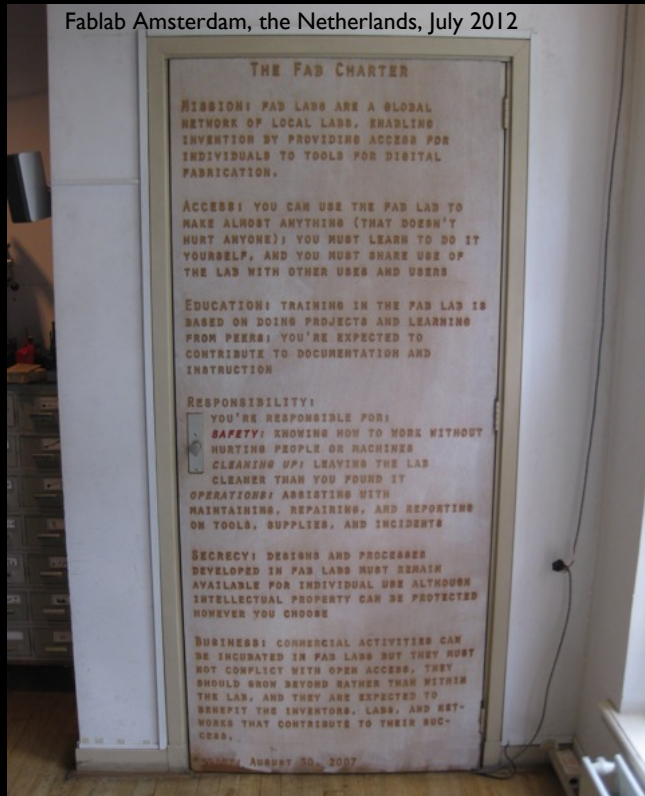
We align with Marres’ argument that we become materially entangled, and possibly implicated in a range of issues, through mundane usage of technologies. What these issues are and who might be implicated in them is, however, not a given. Through the concept of publics-in-the-making, we want to explore and propose making as a means for co-articulations of issues. This means to acknowledge that issues are not just there, but always in-the-making as a joint effort between those humans and nonhumans who have the capacity to act in the given situation.

FUTURE
INFRASTRUCTURE
BUT!
COUNTER-CONTEXTS
IDEOLOGIES AND
IMAGINARIES

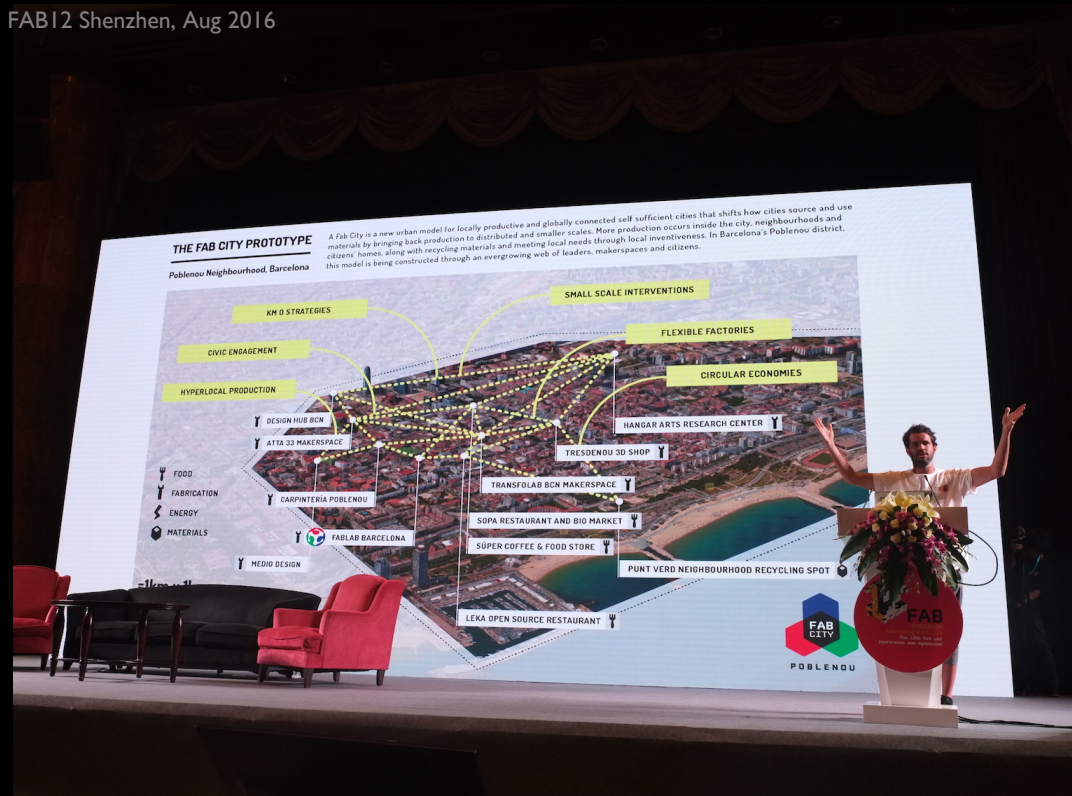


What we say versus what we do: Ideology versus practice

Fablab Amsterdam, the Netherlands, July 2012



FAB12 Shenzhen, Aug 2016



What we say

democratizing
production
empowering
communities
helping users
meet their own
needs

peer learning
community building
sharing
opening
distributing
localizing

What we say

democratizing
production
empowering
communities
helping users
meet their own
needs

ability to build,
disassemble,
reassemble,
repair
production locally
and only
according to need

peer learning
community building
sharing
opening
distributing
localizing

What we say

democratizing
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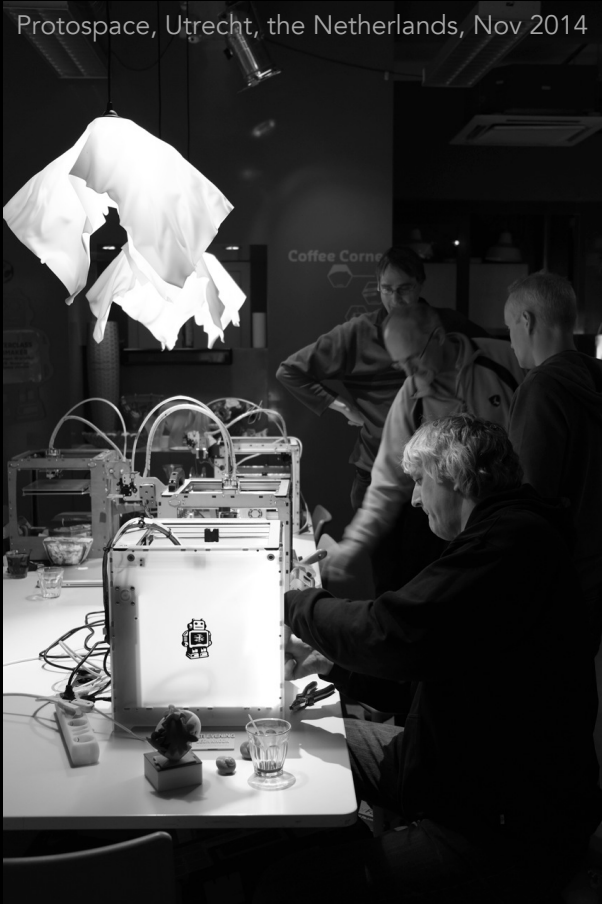


**REDUCED TRANSPORT EMISSIONS, REDUCED EMBODIED
ENERGY OF UNNEEDED INFRASTRUCTURE (e.g. RETAIL)**

MATERIAL ECO-EFFICIENCY, DEMATERIALIZATION

What we do

Protospace, Utrecht, the Netherlands, Nov 2014



Aalto Fablab, Helsinki, Finland, 2012



What we do

hypercapitalism

financial profit

technocracy

mass production

consumerism

crapjects

‘innovation’

‘entrepreneurship’

‘startups’

‘bringing manufacturing
home’

‘STEM education’

grassroots innovation

micro-entrepreneurship

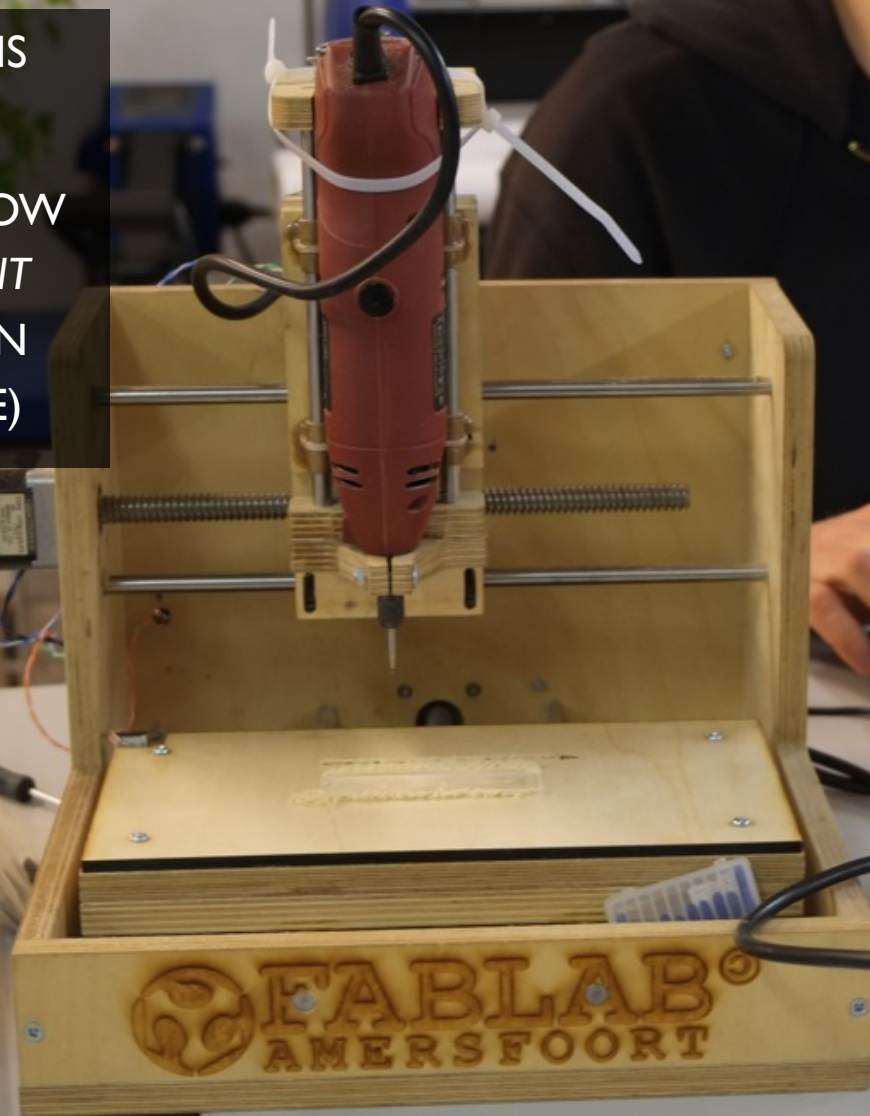
invention

local economies

empowerment

creativity

IDEOLOGY IS
VISIBLE:
PROJECTS SHOW
COMMITMENT
(e.g. TO OPEN
HARDWARE)



IDEOLOGY IS

VISIBLE:

PROJECTS INVITE
QUESTIONS AND
PARTICIPATION



IDEOLOGY IS
VISIBLE:

PROJECTS AND
SPACE
ARRANGEMENTS
(CAN) ENCOURAGE
RECYCLING
AND REUSE



IDEOLOGY IS
VISIBLE:
PROJECTS AND
SPACES ARE
THEMSELVES
SUSTAINABILITY
AND SELF-
SUFFICIENCY
EXPERIMENTS (e.g.
food, building,
energy)



IDEOLOGY IS
VISIBLE:

PEER LEARNING
DOES HAPPEN,
DIVERSITY OF
PARTICIPANTS
APPEARS TO
ENCOURAGE
INVENTION



BUT!
ENVIRONMENTAL
ISSUES ARE NOT
PRIORITIZED IN
FABLABS

EVERYDAY, MUNDANE
TASKS TEND TO
DOMINATE
(MANAGERS' BUSY
SCHEDULES)



ECO-ORIENTED
DIY MAKERS AND
TECH-ORIENTED
DIY MAKERS APPEAR
TO BE DIFFERENT
GROUPS



ONLY FEW EXAMPLES IN
THE GLOBAL NORTH /
EUROPE THAT COMBINE
SUSTAINABILITY
EXPLORATIONS
WITH
DIGITAL TECH
WITH
OPEN DESIGN,
P2P PROCESSES

LABS IN THE GLOBAL
NORTH / EUROPE
LARGELY APPEAR
GENERIC: LOCAL
EMBEDDEDNESS?

PRINCIPLES OF LOCAL
PRODUCTION OR
LOCAL URBAN
ECONOMY?



**AWARENESS OF
SUPPLY CHAINS?
NEGATIVE IMPACTS
OF E-WASTE AND
LABOUR
CONDITIONS?**

← Gold

← Aluminum
(Al)

← Plastic

— MICROPHONE

— SPEAKER

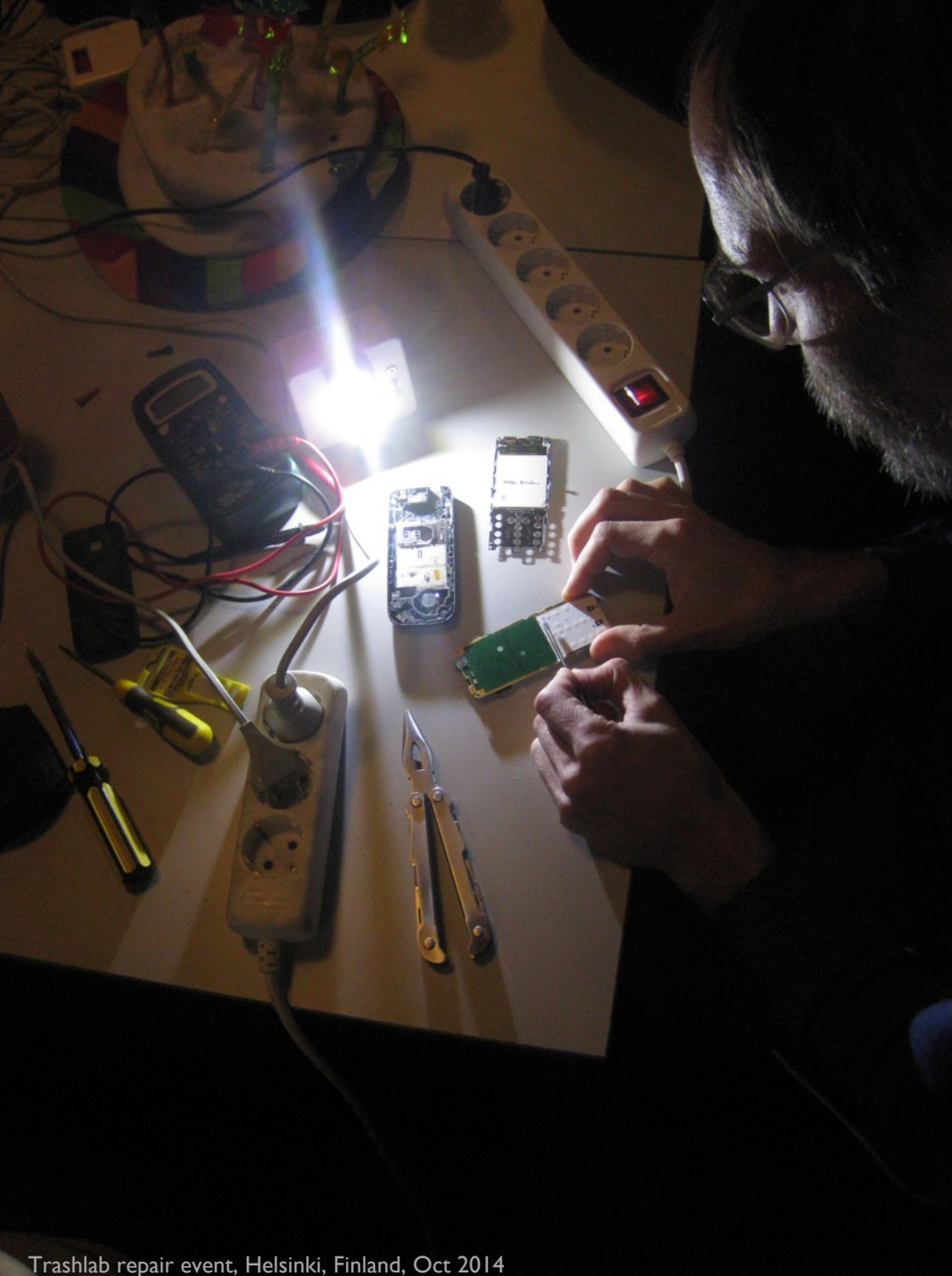
— TINY MOTOR
'VIBRATION'

← TANTALUM



First of all, it highlights, as already pointed out, how sharing a hammer is very different from sharing a piece of code on the net. Consequently, it further shows how open-access commons may present serious issues when it comes to ensuring the sustainability and preservation of tangible commons. Commoning at Fabriken has revealed how traditional commons practices and approaches can only partially respond to the issues raised by commons-based, peer-to-peer production going tangible, as spaces for opening production are often characterized by transient participation and they often gather participants with diverse interests. This means that boundaries are difficult to define and a consensus-model might be difficult to apply. Fabriken brings up the solution of the partner-producer as a way to manage transient and non-consensus based commons, showing both the advantages and limits of this way of operating.

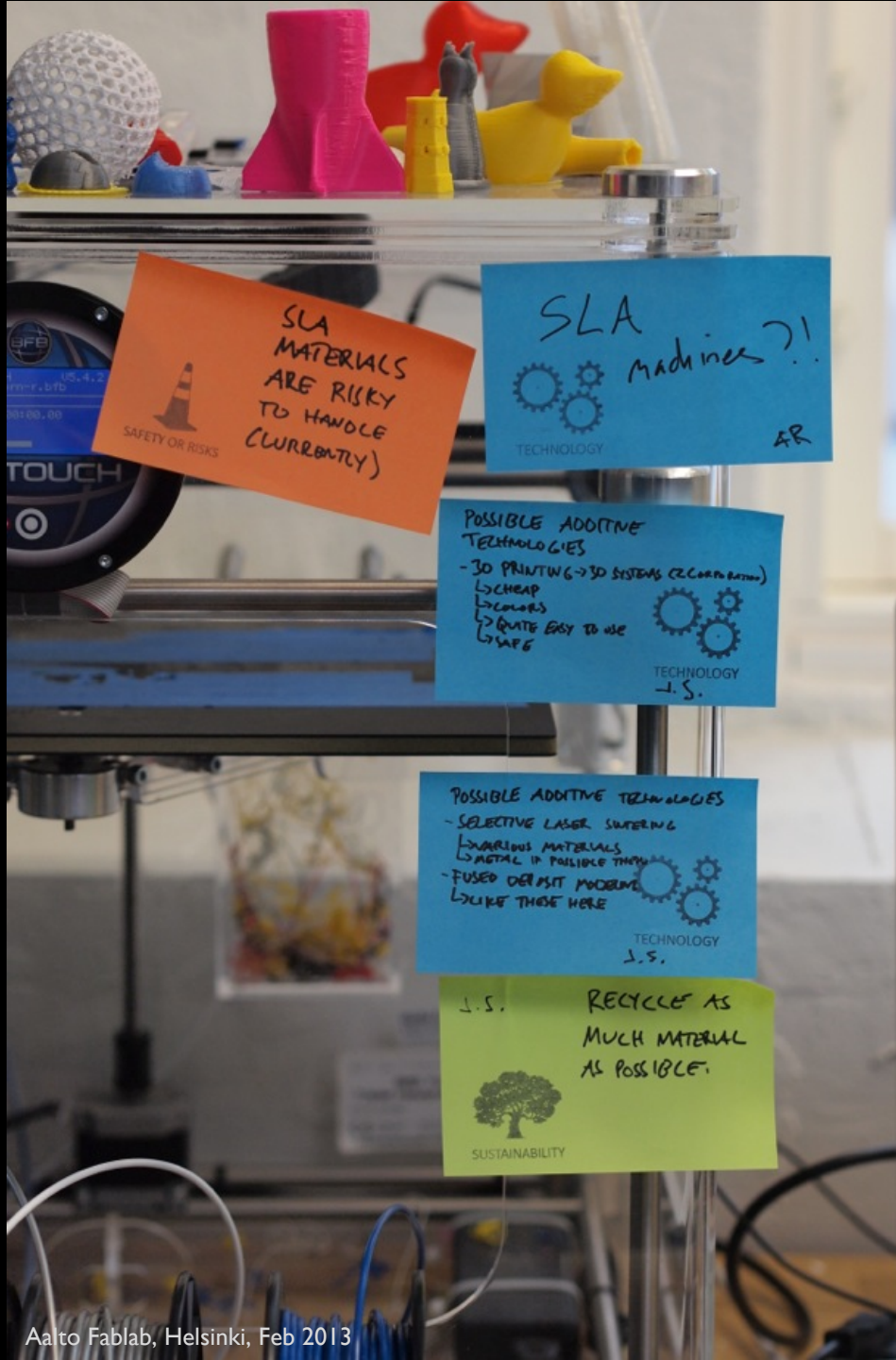
What strongly emerges from Fabriken is that managing commons in the opening of production is a very complex (and located) question that requires articulating openness in relation to the practices and context, as well as developing ad-hoc ways of ensuring and preserving



MATERIAL ENGAGEMENT

CO-ARTICULATING HOW TO LIVE WITH TECHNOLOGY

- FOSTERING CARE
(HUMAN AND
NON-HUMAN)
- ENSURING
CRITIQUE



SLA
MATERIALS
ARE RISKY
TO HANDLE
(CURRENTLY)

SAFETY OR RISKS

SLA
machines?!
AR

TECHNOLOGY

POSSIBLE ADDITIVE
TECHNOLOGIES

- 3D PRINTING → 3D SYSTEMS (2 Cooperation)
- ↳ CHEAP
- ↳ COLORS
- ↳ QUITE EASY TO USE
- ↳ WASTE

TECHNOLOGY
J.S.

POSSIBLE ADDITIVE TECHNOLOGIES

- SELECTIVE LASER SINTERING
- ↳ VARIOUS MATERIALS
- ↳ METAL IS POSSIBLE THOUGH
- FUSED DEPOSIT MODELING
- ↳ LIKE THESE HERE

TECHNOLOGY
J.S.

J.S.
RECYCLE AS
MUCH MATERIAL
AS POSSIBLE.

SUSTAINABILITY

MATERIALS &
ENERGY → NATURAL
RESOURCE
COMMONS

BUT!

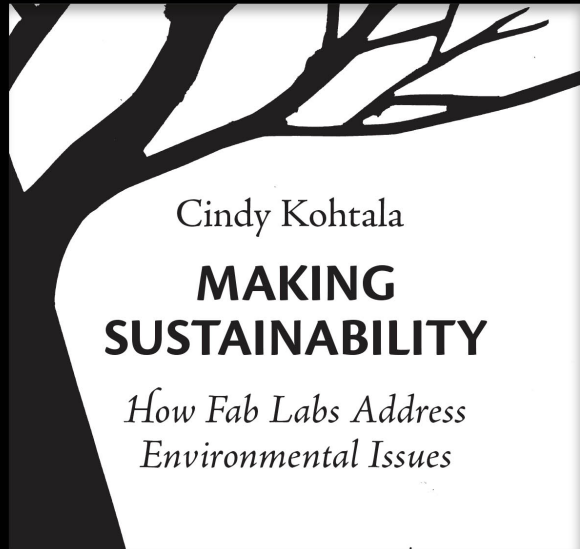
EMPHASIS ON THE
KNOWLEDGE
COMMONS

		SUBTRACTABILITY	
		<i>Low</i>	<i>High</i>
EXCLUSION	<i>Difficult</i>	Public goods Useful knowledge Sunsets	Common-pool resources Libraries Irrigation systems
	<i>Easy</i>	Toll or club goods Journal subscriptions Day-care centres	Private goods Personal computers Doughnuts

Types of goods

		SUBTRACTABILITY	
		<i>Low</i>	<i>High</i>
EXCLUSION	<i>Difficult</i>	Public goods Open design repositories	Common-pool resources Library DIY spaces
	<i>Easy</i>	Toll or club goods Specialized DIY spaces	Private goods Techshops, commercial workshops

Types of community workshops?



MAKERS

making sustainability

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