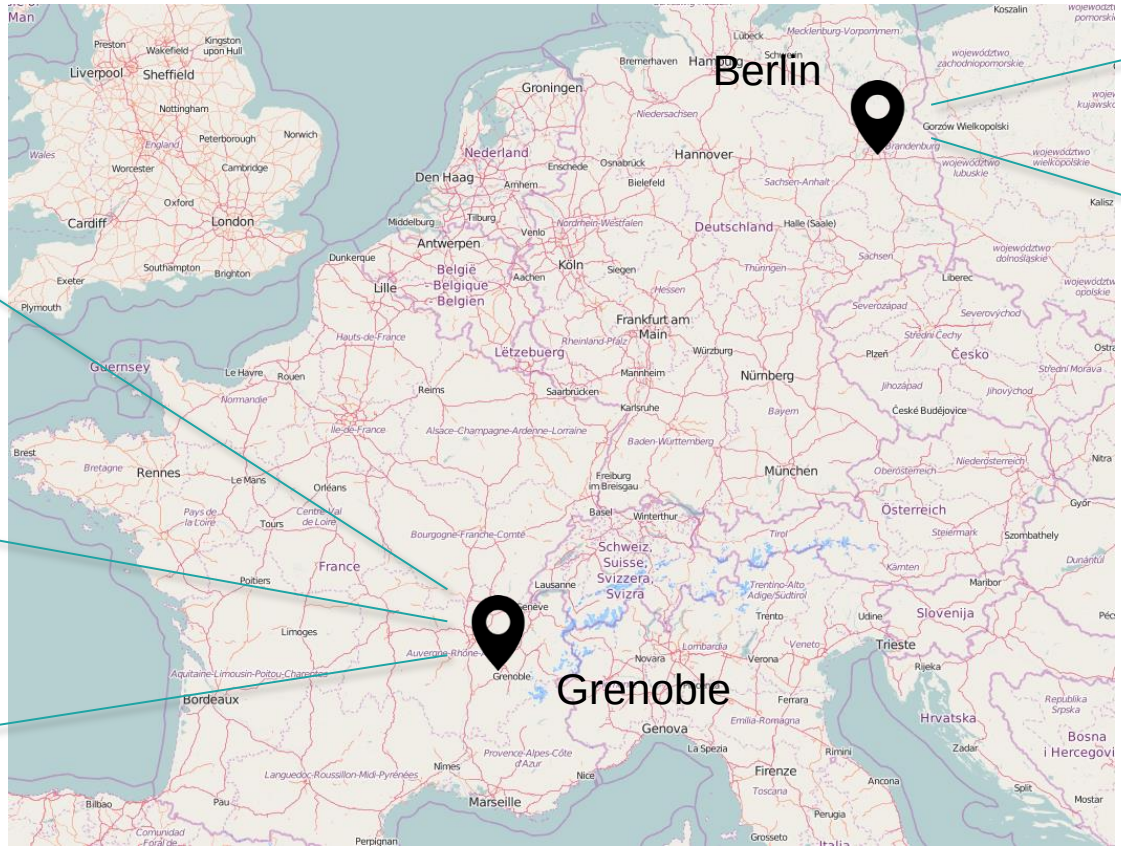
Methods and Tools for Community-Based Product Development

Current state of practices in open source hardware

Jérémy Bonvoisin, TU Berlin

OpenTechSummit 2016

Project partners



RaidLight

G-SCOP

CERAG

+ consulting partners:

Project objectives

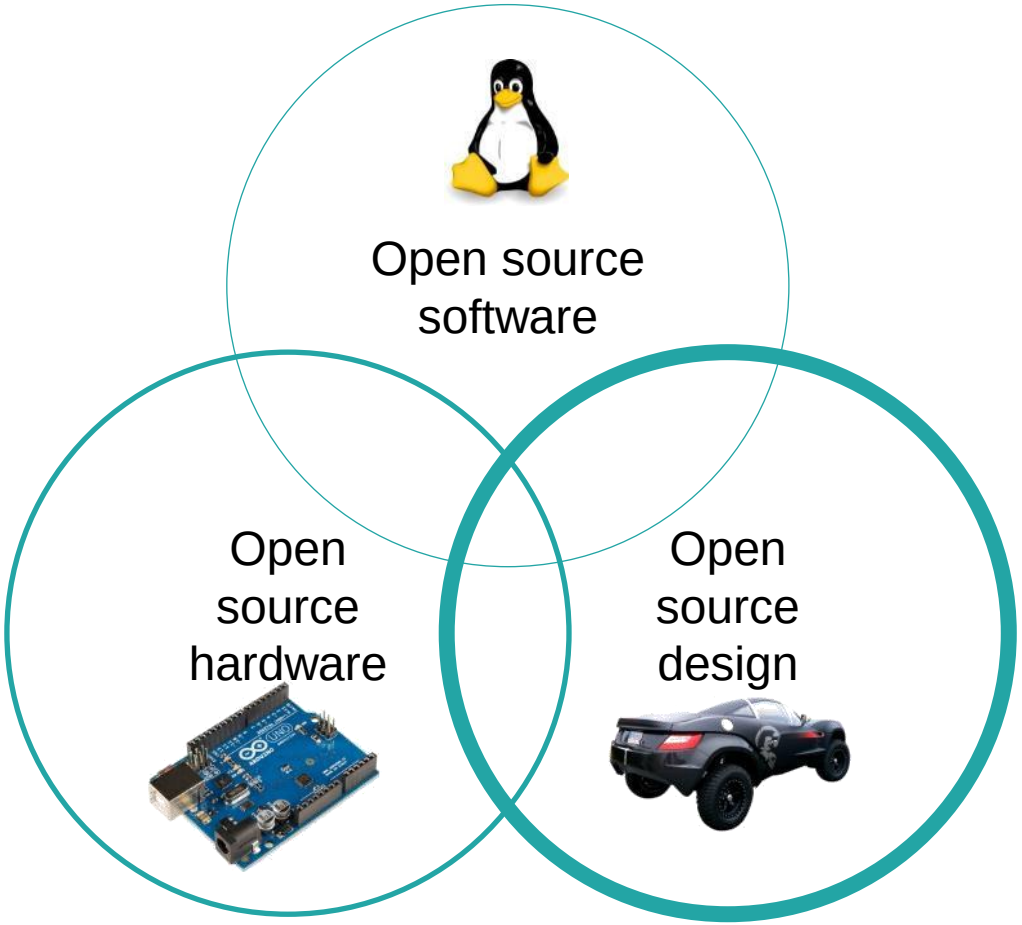
- **Characterize** open source design. Show concrete evidence of this emerging practice and delivering detailed description of the phenomenon.
- **Model** the open source product development process as an alternative to well-anchored industrial product development processes and provide supporting methods.
- **Develop** concrete supporting tools implementing these methods. It will particularly be focused on the concept of a open design platform.

- Foci:
  - Product development process
  - Organisatinal models
  - IT-infrastructure

Preliminary clarifications

		Outcome	
		Closed	**Open**
Process	**Closed**	*Closed innovation*	*Public innovation*
	Open	*Crowdsourcing*	*Open source innovation*

Preliminary clarifications



Questions

What does success means for open source product development projects?

What are the motivations to contribute in open source product development projects?

What are the hierarchical relations between project contributors?

How collaborative are open source product development projects?

How open are open source products?

What is the intention followed by making a product open source?

How contributors create value?

How efficient is open source product development?

How to ensure that a project comes to an end?

How significant is the phenomenon of open source product development?

How many significant existing open source product development projects exist

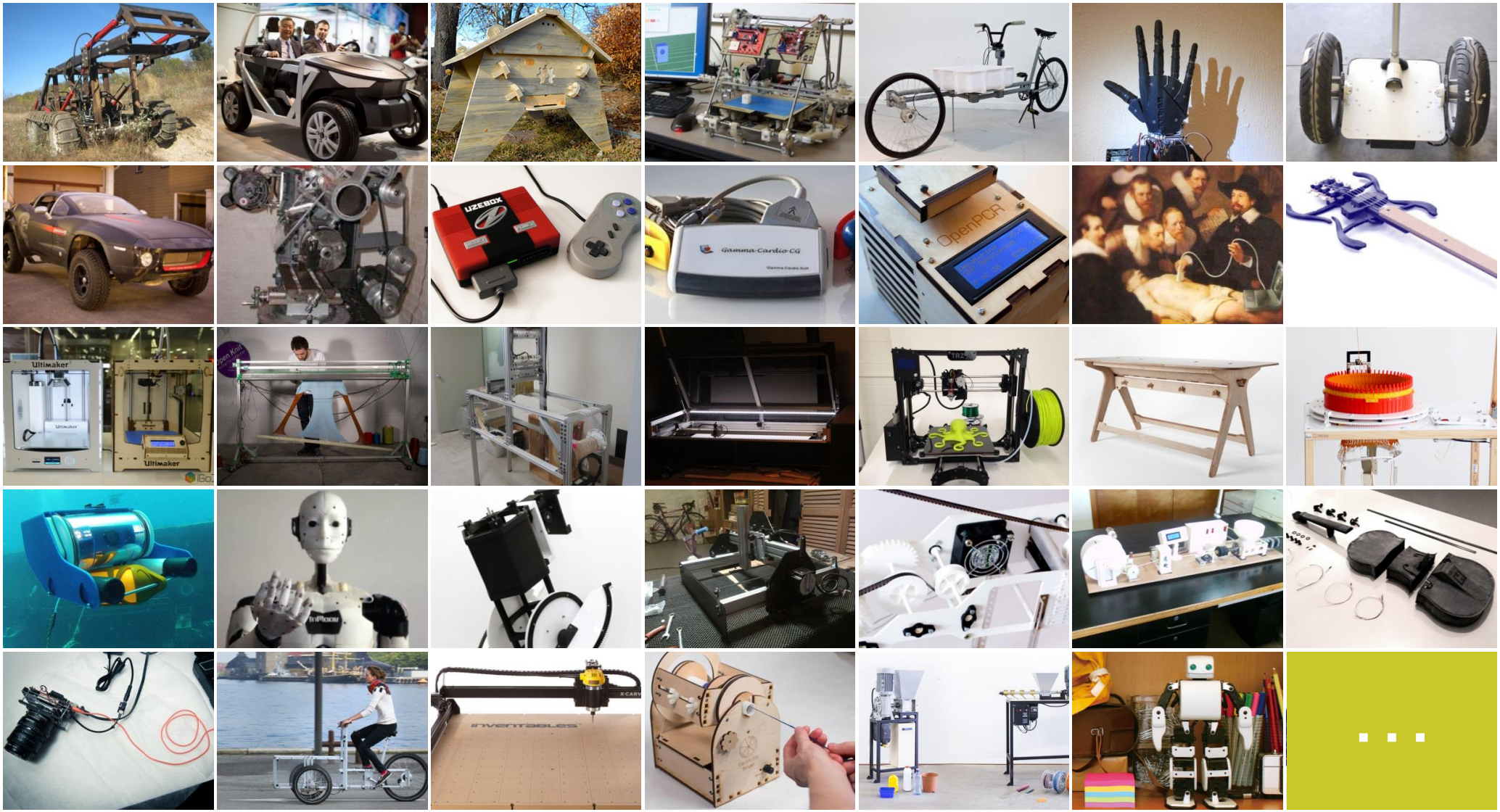
What are the minimal criteria to call a product „open source“?

Can we define an openess scale for open products/projects?

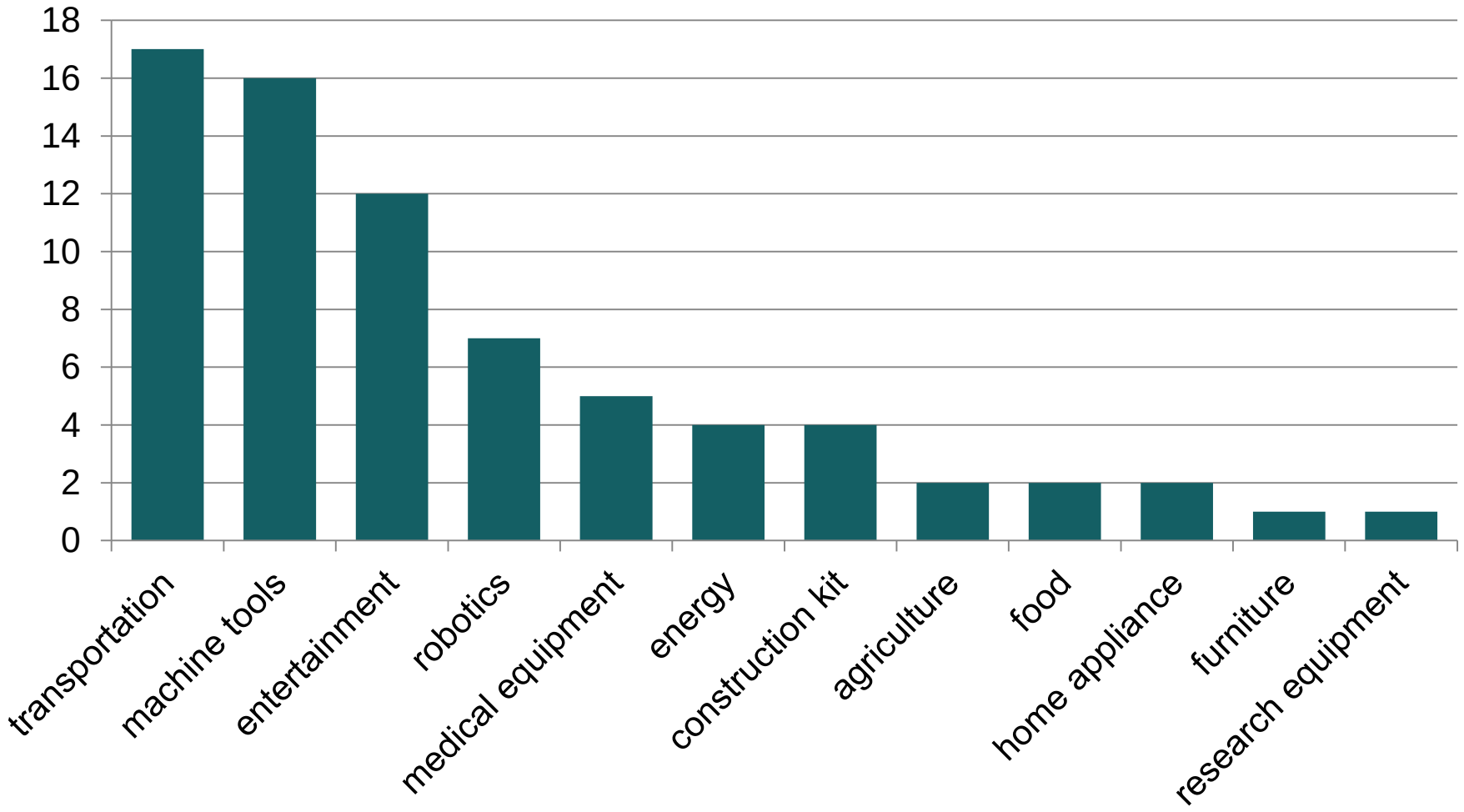
How qualified are contributors to open source product development projects?

Is there a limit to the complexity of products developed in an open source process?

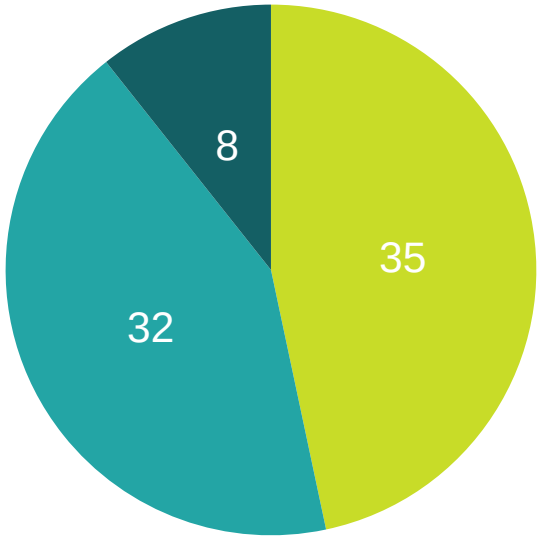
75 open source product development projects



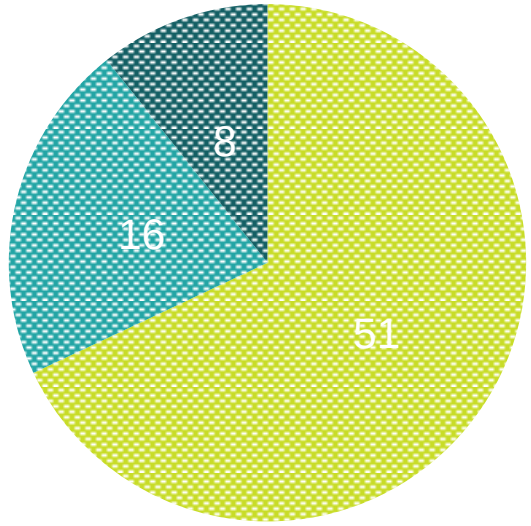
Number of projects per product category



Share of Software/Hardware/Mechanics



- Pure machanics
- Mechanics + Hard/Soft
- Pure electronic hardware



- active
- inactive
- unknown

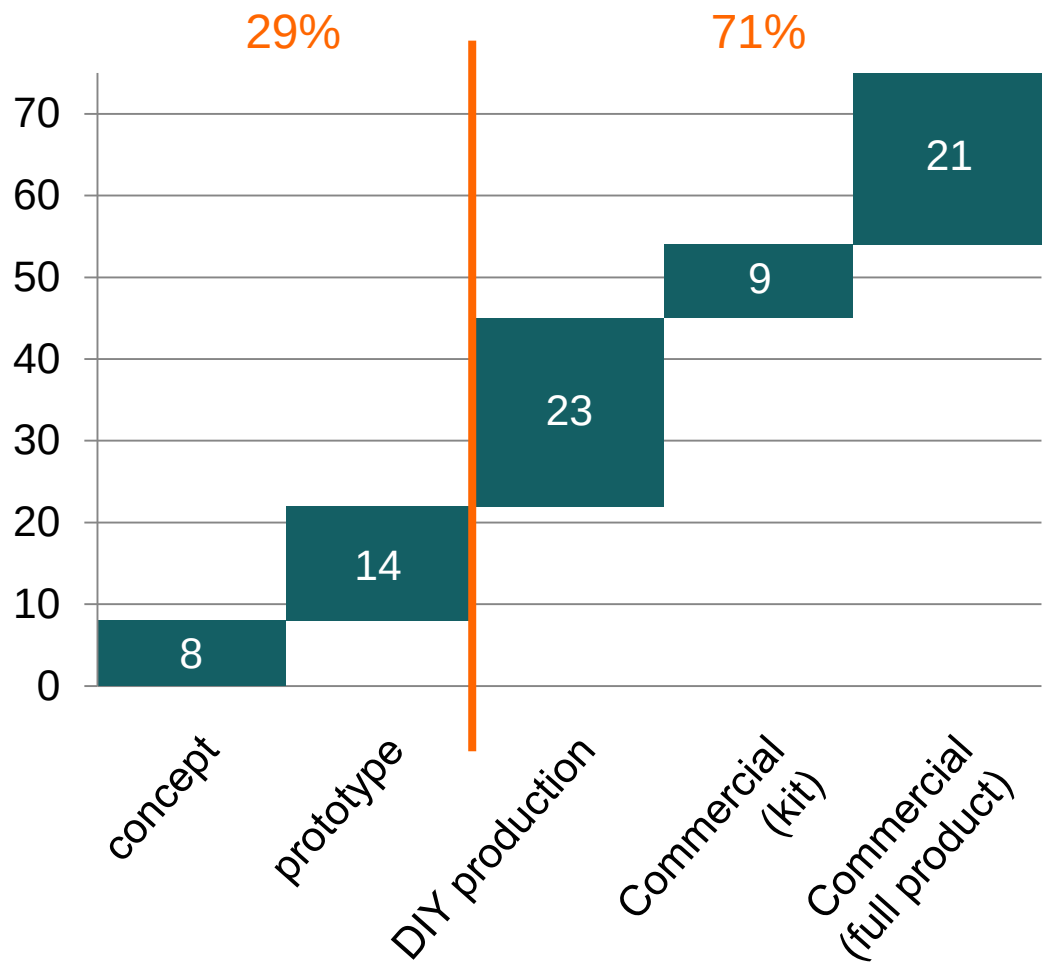
Findings (1)

Empiric evidence (or confirmation) of the existence of open source tangible products

Empiric evidence (or confirmation) of the growth of open source tangible products

Empiric evidence (or confirmation) of the effectiveness of open source tangible products

Stage in the product development process



Findings (2)

Public innovation

Broadcasting innovations

Vs.

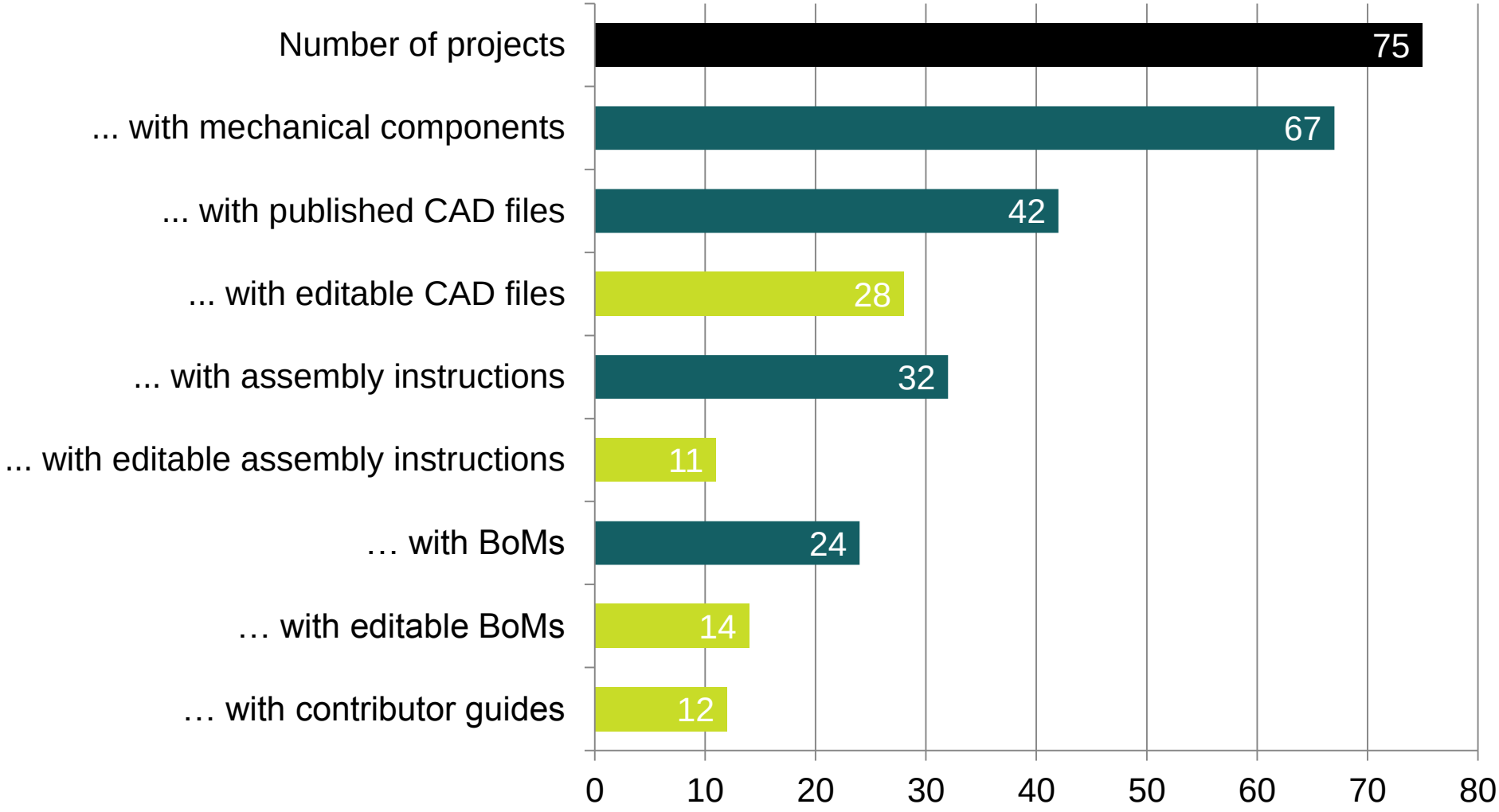
Open source innovation

Co-developing innovations

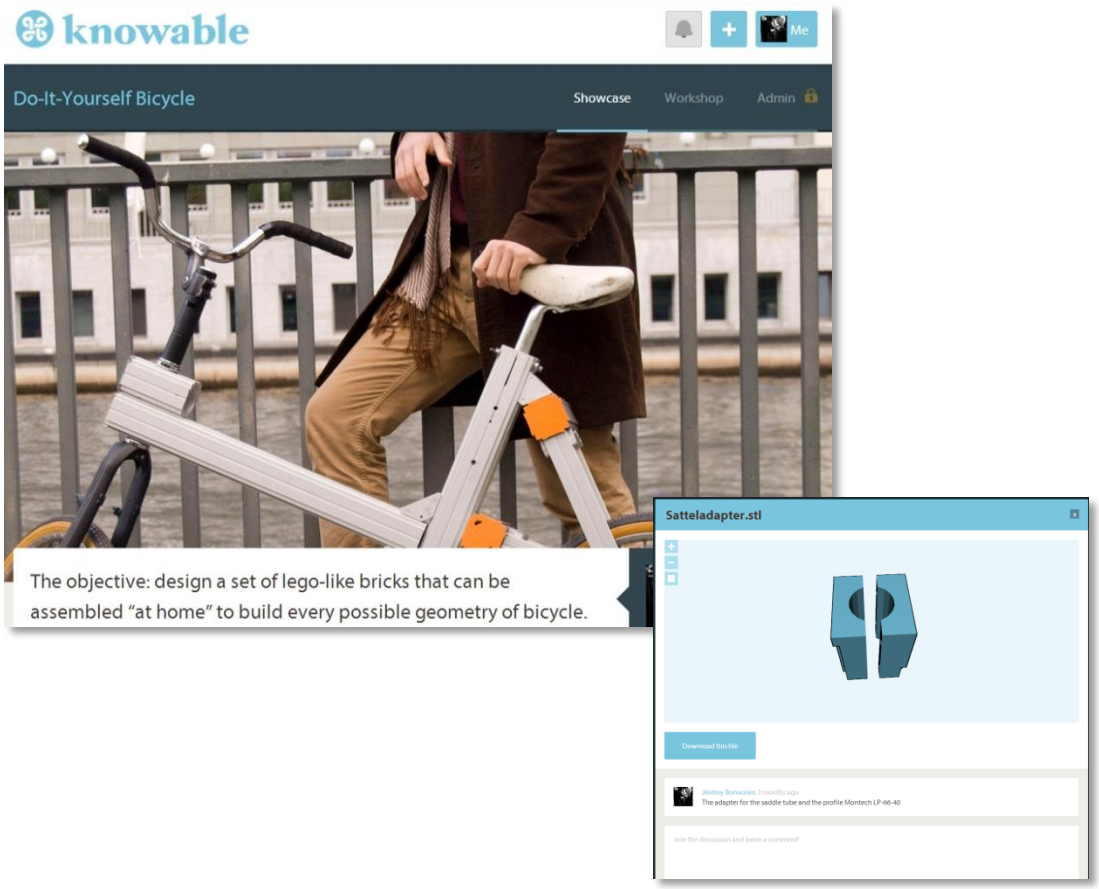
Best practices of open source hardware according to OSHWA

- Original Design Files
  - “The act of sharing these files is the core practice of open-source hardware.”
  - “It is […] essential to share these **original design files**; they constitute the original “source code” for the hardware.”
- Auxiliary Design Files
  - “Beyond the original design files, it is often helpful to share your design in additional, more accessible formats.”
  - „These auxiliary design files allow people to study the design of the hardware, and sometimes even fabricate it“
- Bill Of Materials
- Instructions and Other Explanations
  - Design rationale
  - Making the hardware
  - others might want to modify your instructions as they modify your hardware design, so it’s good to provide the **original editable** files for your documentation

Shared editable documentation (mechanics)



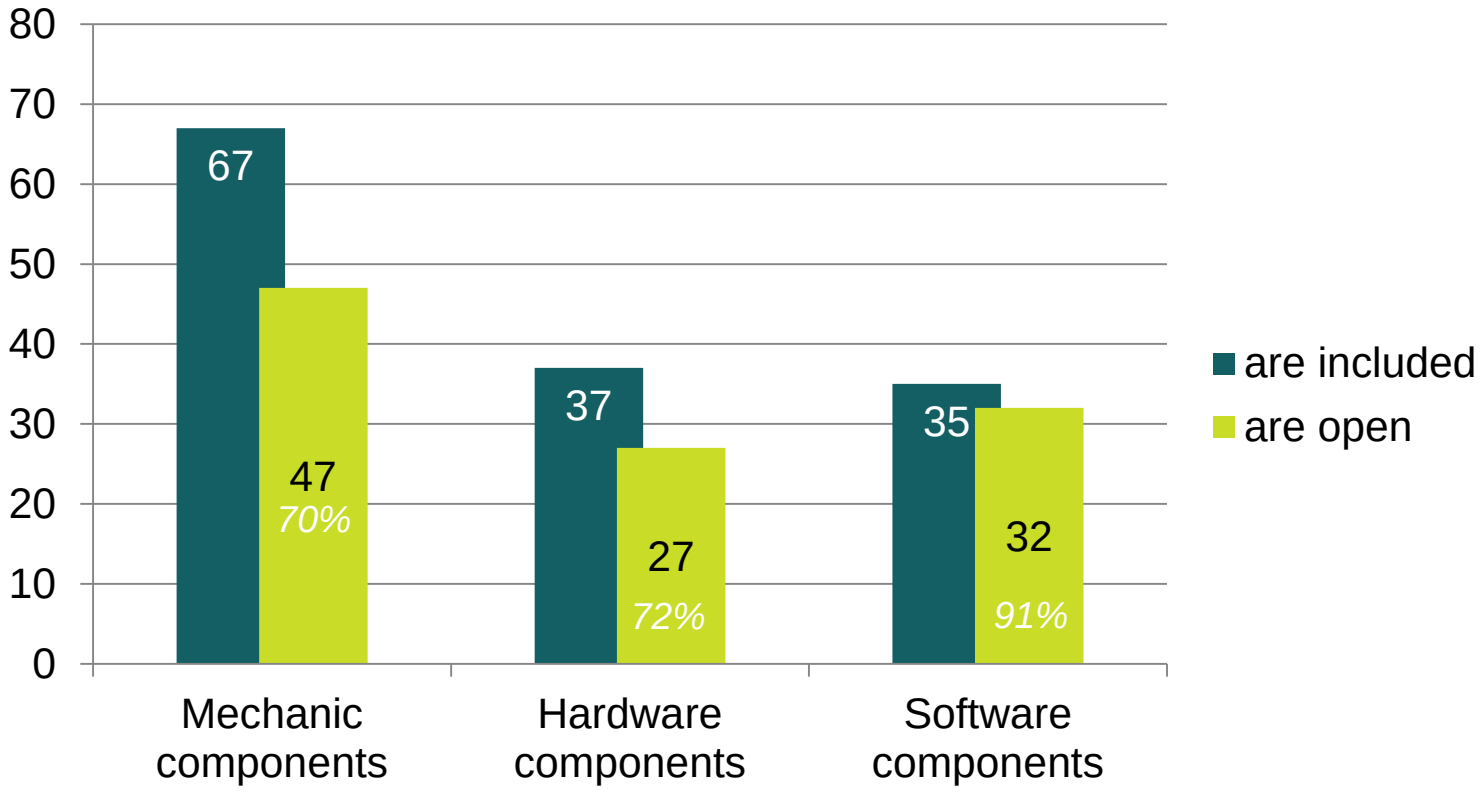
Learnings from *knowable.org*



Findings (3)

Openness is lived as a complex and gradual concept

What is made available online?



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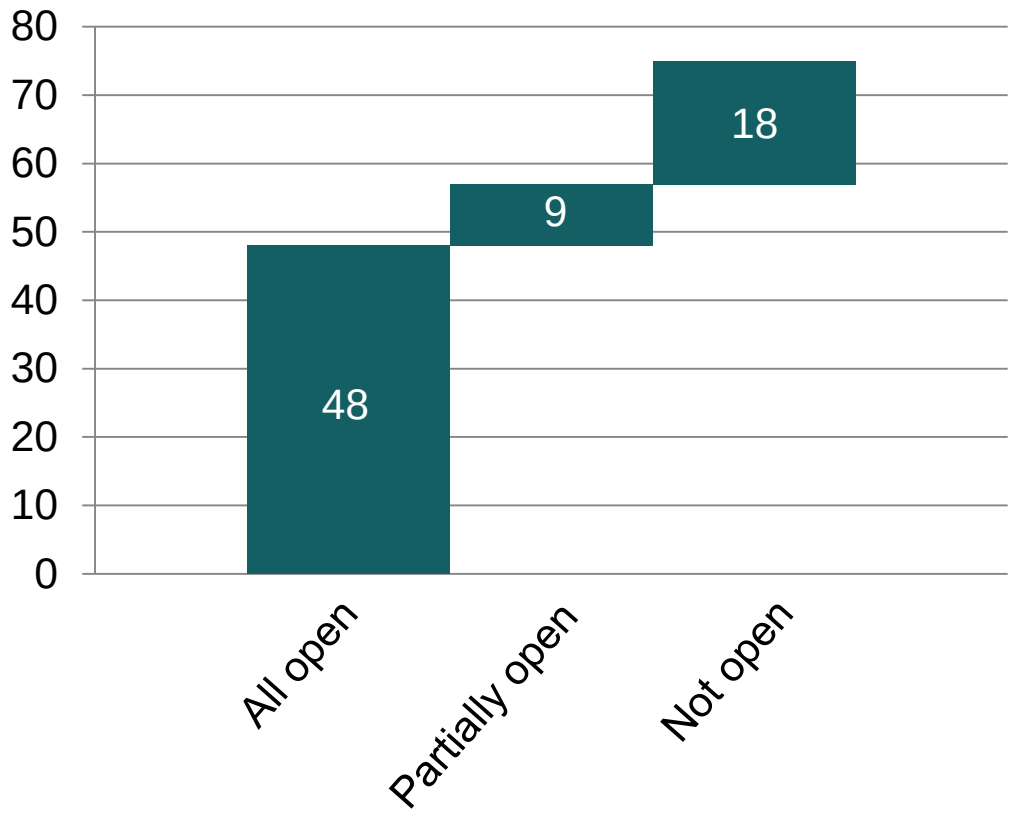

Typical cases

The shift to a circular economy presents a wicked, multidimensional problem: how can we redesign our operating system so that it works in the long term, and reflects the current context in terms of resources, energy and economic pressures?

It's hard to know where to start. After all, with our once-successful linear economy reaching its limits, you could say that designing economies that last has, never really worked that well for us in the past. The challenge is really about enabling an ecosystem to emerge which effectively (re)uses materials and resources, and rebuilds economic, social and natural capital.

When we look at the circular economy field now, it's dominated by large corporate players – and we do need these businesses taking on responsibility and leading with their considerable research, manufacturing and marketing clout. But redwoods and rhinos don't make a whole ecosystem, there are many more parts to be played. To live up to the rhetoric and develop a real circular economy we need diversity of size, of focus, of motivation, and perspectives.

Photo: circularnews.org – Sam Muirhead, April 13, 2016

Start claiming openness before sharing anything

Typical cases

Photo: www.knitic.com/

Open hardware, open software, closed mechanics

Typical cases

Fatal error: Cannot instantiate non-existent class: dmconfig in /home/httpd/vhosts/theoscarproject.org/httpdocs/administrator/components/com_docman/classes/DOCMAN_config.class.php on line 88

Terminated project, vanished data

Photo: (C) 2012 OScar - Reinvent Mobility, retrieved on web.archive.org

To be continued… Online database and surveys

- More data / more sophisticated analysis
- Open online database
  - Gather and characterize open source product development projects
  - URL to be announced soon (<something>.opensourcedesign.cc)
- Qualitative data acquisition campaign
  - Semi directed interviews of open source product development project contributors
  - June/July 2016
- Quantitative data acquisition campaign
  - Large scale online survey
  - August / September 2016

To be continued… Call for participation

- You are contributing in an open source product development project?
  - Register in the online database!
  - Get interviewed!
  - Participate to the survey!
  - Email me @: bonvoisin[at]tu-berlin.de!
  - Come and talk to me!

To be continued… Open Source Circular Economy Days

- What makes open source hardware open source?
  - reflect on the concept of open source and on best practices of open source hardware
  - working on the definition of an openness index for product (development projects)

Color and fonts

Turquoise: R-35 G-165 B-165 

Dark cyan: R-20 G-95 B-100 

Lime Yellow: R-200 G-220 B-40 

Orange: R-255 G-102 B-0 

Grey 2: R-180 G-180 B-180 

Black: R-0 G-0 B-0 

Use Turquoise and Lime Yellow a lot. Use orange very little. It is meant to just be a little accent of color.

Font: **ARIAL**