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The convergence of digital commons with local manufacturing from a degrowth perspective: Two illustrative cases

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The Convergence of Digital Commons with Local Manufacturing from a Degrowth Perspective: Two Illustrative Cases

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1. Introduction

With the rise of new information and communication technologies, the commons[1], i.e. shared resources where each stakeholder has an equal interest (Ostrom, 1990), received a boost (Helfrich & Bollier, 2014). Increasing access to networked computers has facilitated free cooperation and production of digital commons of knowledge and software among individuals and groups (Benkler, 2006). Initiatives such as the free encyclopedia Wikipedia and a myriad of free/open-source software projects (e.g. GNU/Linux, Apache Web Server) exemplify a new mode of information production named "commons-based peer production" (Benkler, 2006). Commons-based peer production (CBPP) is, therefore, a new way of value creation and distribution that appears within the ecosystems of commons-oriented communities, where open technological infrastructures allow individuals to communicate, self-organize and, ultimately, co-create non-rivalrous use value without the need to seek permissions (Bauwens, 2005; Benkler, 2006).

If the first wave of CBPP mainly included open knowledge and software projects (Bauwens, 2005; Benkler, 2006), the second wave seems to be moving towards open design, which is linked to the production of hardware and thus can have an impact on manufacturing (van Abel et al., 2011; Kostakis et al., 2013; Rifkin, 2014). Just as networked computers have been distributed in the population of the most advanced societies as well as parts of emerging economies enabling people to produce and share information, the emergence of networked "makerspaces" seems to distribute the means of making (Kohtala & Hyysalo, 2015; Niaros, 2016). Such spaces can either be hackerspaces, micro-factories, fab labs or other co-working spaces which are equipped with desktop and benchtop manufacturing technologies. It should be noted that anything from three-dimensional (3D) printers or laser cutters to simple cutting tools or screwdrivers may be considered local manufacturing technologies, which enable the customized manufacturing of physical items from one's desktop or benchtop. Local manufacturing technologies can use both desktop and benchtop manufacturing either separately (e.g. a spacer for asthma medications made from a plastic bottle with the help of a simple cutter tool or a plastic tape dispenser which can fully be 3D printed) or in combination (e.g., when building a new RepRap 3D printer, where 3D printed parts need to be connected via nuts and bolts). This paper adopts this concept and not similar ones, such as "personal fabrication" (Gershenfeld, 2007) or "personal manufacturing" (Bauwens et al., 2012), because the latter put the stress on the individual. Other concepts like "digital manufacturing" or "digital fabrication" (Gershenfeld, 2012; Blikstein, 2013) are too narrow, as they exclude low-technologies.

Commons-oriented makerspaces offer collaborative environments where people can meet in person, socialize and co-create (Niaros, 2016). They acquire their tools by joint contributions from

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1   The notion of "commons" has been defined in manifold ways. Since this paper attempts to describe an emerging phenomenon, it embraces a broad understanding of the concept. The commons is a general term for shared resources where "no single person has exclusive control over the use and disposition of any particular resource" (Benkler, 2006, p. 61). The commons sphere may contain either rivalrous or non-rivalrous goods and resources. These have either been inherited or are man-made and may be governed by humanity as a whole or by a specific community. For example, a commons may include natural gifts, such as the air, water and land, and shared assets or creative work, like cultural and knowledge artifacts (Bollier, 2009).