A New Printing Revolution? 3D Printing as an Agent of Socio-Political Change

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ABSTRACT

There is a growing interest in 3D printers because of the technical and economic implications they could have. The objective of this paper is to take the analysis further by asking to what extent they could also have a range of socio-political effects, as a consequence of their impact on the material practices of production and consumption. The first part of this contribution re-examines the promises associated with this technology and highlights its prospects for restoring individual and collective capabilities (I). Secondly, the ways in which these machines could destabilize the industrial bases of contemporary societies, and therefore the economic order, are analyzed, along with the political implications of such a shift (II). Finally, the latent constraints and the points of friction that these technological developments may encounter and that might affect future trajectories are clarified (III).

KEYWORDS

3D Printing, Political Change, Socio-Technical Systems, Technological Change

INTRODUCTION

Today 3D printers (i.e., three-dimensional, since they work by adding layers of material one on top of the other) are generating increased debate. In the perspectives commonly presented, potentially important changes for making a range of everyday objects are signaled. But these are not the only issues they raise. Certainly, there are technical and economic effects (Lipson and Kurman, 2010; Ratto and Ree, 2012), but beyond this, there could also be more structural and far-reaching social and political implications. It is these implications that this contribution aims to explore.

These technical developments, combining digital design and new modes of automated production, open spaces for experimentation, which are for the moment mainly visible in small business niches or in workshops and communities of technophile tinkerers like “fab labs” (“fabrication laboratories”) and “hackerspaces”. But, since a range of these tools is designed to be eventually accessible to the broader public (Gordon, 2011), it is useful to look beyond the still experimental nature of these initiatives. One can indeed make the hypothesis that changes in the social and political realm - potentially profound changes - can also occur by the accumulation of dispersed practices even if they appear merely technical, just as computer connections over the Internet have not only opened up new possibilities of communication, but also catalyzed social and political changes.

Beyond the economic impacts that are increasingly being considered, it is this potential socio-political dimension that also deserves consideration, especially insomuch as the chain of implications for the redistribution of capacities and forms of power could be felt on a large scale. It is not a question of merely affirming the political character of technological change, which is now commonly accepted, but of signaling that some technologies contain potentialities for change which go beyond the intentions of their designers. The scope of that change will only be revealed in their conditions of
actualization. Nor is it a question of returning to naïve technological determinism. This article aims at exploring what might be called a “technological potentialism,” which means thinking in terms of situations where new or evolving technologies may be appropriated, used, adapted, etc., and where their use could therefore find a new meaning for interested individuals and groups. In other words, this potentialism does not stem from an essence, an intrinsic nature or an autonomous power of technology, but from the way actors will be able to find new opportunities in technological developments or in technological solutions that are themselves new.2

3D printing is a technology that seems to open up a range of possibilities. It has all the appearance of a “disruptive technology”3, because it seems capable of prevailing over other established technologies in terms of performance, so as to significantly change the practices of its users, and as a result, the competitive conditions between economic operators. It also has all the appearance of a “general purpose technology”, because its uses and applications could affect the entire economic system and bring about profound and structural changes, from the work world to the domestic sphere (Helpman, 1998; Jovanovic and Rousseau, 2005).

In retrospect, another type of printing, printing on paper, shows the cumulative influences that a material technique can have on human activity, thus justifying its analysis as an “agent of change” (Eisenstein, 1979). But a still-developing innovation may be more difficult to grasp. What is also at stake in this case is to know how to assess the potential effects of a technology that is not yet developed, in other words, how to understand in what ways this technology can be used, the resources that become available as a result and the changes that may result from it. It is even more difficult to analyze this type of technology since it captures and feeds a whole sphere of imagination (which is sometimes close to the science fiction genre4). To avoid drifting into pure speculation, it is essential to keep in proper perspective the different types of discourse, both emphatic and critical, that may surround new technological developments.5 These various accompanying discourses could justify a separate study, but the drawback would be no longer being able to comprehend these technological developments themselves and their potential impact.

More specifically, 3D printing raises questions anew about the way the economic and political order can be influenced by technology. For the most part, the capitalist order was built upon machines. Could it be destabilized by a new kind of machine with disruptive potentialities? To what extent? In this article, it is precisely a question of identifying and analyzing these potentialities, especially as material factors that can also have a chain of effects and go as far as having political ramifications. The generalization of this type of machine, like household computers, can lead to changes in the materiality of practices, consumption patterns, and consequently in production systems. What uses do they make possible? What kind of resources do they offer for users? With what constraints? What type of reconfigurations could they bring about?

Without falling into technological determinism, the exploratory analysis proposed in this article stems from the hypothesis that a technical development can have systemic effects. Machines can have different and more indirect outcomes that those they were designed or planned for. Technical change could then contribute to social change, through joint and convergent developments. This is also why it is important to consider the stakes and consequences of technical developments, the uses that can be made of them, the values they embody, the perspectives that are open (particularly in terms of impact on human well-being and quality of life), the mediations they reconfigure. All these aspects have societal, ethical and political significance and can justify not let these technical developments and applications without reflexive treatment and without lucid, or even critical, accompaniment (Brey, Briggle and Spence, 2012; Verbeek, 2013).

However, methodological precautions need to be taken when going forward with this type of analysis, namely “extracting the notion of machine from an industrial conception”, which reiterates one objective defined by Frédéric Vengeon (2009: 177) in a program for the Collège international de philosophie. Machines that print in three dimensions incorporate both mechanical and digital/computational/informational factors (according to the preferred terminology). Both material and data
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