

## Chapter 2

# Open Source and Economic Models in an Evolutionary Approach

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### **ABSTRACT**

*Despite being a commons, free and open source software has come to dominate software production. FOSS surprising trajectory passed so far through two distinct stages. It originated within self-organized communities of developers and was later sustained by market adoption and innovative forms of economic competition. Its economic model was initially interpreted as a gift economy. Today it is better understood as based on hybrids that modulate markets and commons. By analyzing the trajectory of FOSS through two approaches with roots in evolutionary economics—the multi-level perspective and the techno-economic paradigms—FOSS takes on the characteristics of a development and innovation system that has grown with the digital paradigm and is destined to occupy an important function in its further development. The evolution of FOSS has not ended. On the contrary, a third phase of FOSS development is looming, which will be characterized by greater government involvement and further innovations in FOSS governance systems and economic models.*

### **INTRODUCTION**

Free and open source software (FOSS) has come to largely dominate software production, i.e., the leading technology and industry of the digital revolution (Berlinguer, 2021).

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Open source plays a central role on all the main frontiers of digital innovation, from Cloud computing, to IoT, AI, 5G, DLT, and even Quantum computing; and open source solutions have become a central terrain for capitalist competition as well as an arena for convergence, standardization and industry-wide forms of collaboration.

FOSS had a spectacular evolution. Its unconventional way of organizing the production of software in fact has taken its first steps at the margins of industry, within informal communities of autonomous developers. This evolution is even more surprising since this has happened despite FOSS challenging characteristics. In fact, FOSS is a digital commons (Benkler, 2013). The most distinctive feature of FOSS is that it is governed by licenses that allow anyone to access, use, copy, modify, develop and redistribute it. It radically overturns the principle of exclusivity enforced by the Intellectual Property Rights (IPR). And this basic institutional arrangement has crucial implications for models of governance and ways of appropriating the value of the resource (Benkler, 2013; Berlinguer, 2018).

For this and other characteristics - such as the voluntary character of the contributions, the absence of hierarchical ties and market exchanges - initial characterizations of FOSS have often been of a utopian hue. FOSS was described as a “gift economy” (Raymonds, 1999;), a “third model of production” – “commons-based peer production” (Benkler, 2001; 2006;) – and sometimes as an illustration of an emerging post-capitalistic mode of production (Bauwens 2005; Vercellone et al. 2015; Mason 2016; Rifkin, 2014).

At the beginning of its trajectory, these unconventional features created quite a few challenges and many obstacles to the spread and adoption of FOSS. Microsoft, which has long been the quintessential adversary of FOSS, used it to foment the FUD (fear, uncertainty, doubt) syndrome, which was widespread among the managerial class and long surrounded FOSS discouraging its adoption by companies, organizations and governments.

Today the picture is radically different. So much so that Microsoft itself likes to present itself as the company that contributes most to the open source world. In this new situation, the widespread temptation might be to consider the unconventional features of FOSS gone. This “normalization” could be argued either by pointing to the selective capture and co-optation of its alternative instances by the market and capitalism (O’Neil et al., 2021), or by hollowing out, domesticating, and trivializing its original novelties: as if to say that, in fact, there was nothing really new under the sun.

There is some truth in both of these narratives, which capture aspects of the evolution of FOSS. However, on the whole, they fail to account for the trajectory of FOSS and the many innovations that have accompanied its growth and expansion. Above all, they draw premature conclusions about the evolution of this new approach

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