2007), which makes prior products/processes and knowledge obsolete (cf. Colombo et al., 2015) . Aghion et al. (2015) argue, that Schumpeterian growth paradigm, based on models growth as resulting from major innovations involving creative destruction, sheds light on sev-eral aspects of the growth process that cannot be properly addressed by alternative theories. Three important aspects of this Schumpeterian growth theory are: (a) the role of competition and market structure, (b) firm dynamics, and (c) the relationship between growth and devel-opment.

Lipsey and colleagues (1998, p. 43) define the General Purpose Technology: "a technology that initially has much scope for improvement and eventually comes to be widely used, to have many users, and to have many Hicksian and technological complementarities". GPTs are enabling technologies that exert a pervasive impact across firms, industries and that permeate the overall structure of the economy (Coccia, 2005, 2010a). The diffusion of GPTs is by sev-eral ripples of effects that remove barriers and generate significant techno-economic change in society (Peirce, 1974). Coccia (2005) classifies the GPTs, in the scale of innovation intensity, with the highest degree of socio-economic impact. In particular, Coccia (2005, pp. 123-124) claims, referring to revolutionary innovations such as GPTs, that:

> The means of human communication are radically changed and a new means of communication, which heavily affects all the economic subjects and objects, is born, forcing all those who use it to change their habits. A new technoeconomic paradigm is born . . . . The propulsive capacity for development offered by seventh-degree innovation is so high that it hauls the entire economy. Thanks to the new methods of communication, there is also greater territorial, social, and human integration. Another characteristic of seventh-degree innovations is the ease of their spread. The mobility of people, goods, capital, and information increases and the time taken to travel and communicate is reduced.

Bresnahan and Trajtenberg (1995, pp. 86-87) show that GPTs have a treelike structure with basic new technology located at the top of the tree and all derived technologies radiating out towards every branch of the economy. In fact, the *General Purpose Technologies generate clusters of new technology in several industries because they are basic processes/components or general infrastructure for the architecture of various families of products/processes that are made quite differently*. The different applications of new GPTs are driven by firms to maximize the profit and/or to exploit the position of a (temporary) monopoly in different sec-tors and/or industries over time (Coccia, 2015).

In general, GPTs are characterized by pervasiveness, inherent potential for technical improvements, and 'innovational complementarities', giving rise to increasing returns-to-scale, such as the steam engine, the electric motor, and semiconductors (Bresnahan and Trajtenberg, 1995, p. 83, original emphasis) . Jovanovic and Rousseau (2005, p. 1185) show that the distinguishing characteristics of a General Purpose Technology are: (1) Pervasiveness: "The GPT should spread to most sectors". It has an impact on technical change and productivity growth across a large number of industries; (2) Improvement: "The GPT should get better over time and, hence, should keep lowering the costs of its users". It should lead to sustained productivity growth and cost reductions in several industries; (3) Innovation spawning: "The GPT should make it easier to invent and produce new products and processes" (cf., Bresnahan and Trajtenberg, 1995). Lipsey et al. (1998, p. 38ff) describe other main characteristics of GPTs, such as: the scope for improvement, wide variety and range of uses during its techno-logical evolution and strong complementarities with existing or potential new technologies. Another main feature of GPTs is a long-run period between their initial emergence as inven-tion and final commercial introduction in new products/processes (Lipsey et al., 1998; 2005). Rosegger (1980, p. 198) showed that the estimated time interval between invention and major innovation can be about 50 years: e.g., electric motor is about 58 years, electric arc lights 50 years, telegraph about 44 years, synthetic resins 52 years, etc. Overall, then, GPTs are complex technologies (general platforms -e.g., satellites- or basic components- e.g., semiconductor-) that induce product/process innovations in several sectors for a vital corporate, industrial, economic and social change over