

General purpose technologies in dynamic systems: visual representation and analyses of complex drivers¹

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ABSTRACT

The main aim of this study is to provide a new graphical representation of the potential root causes of General Purpose Technologies (GPTs) for the analysis and foresight of these path-breaking innovations that support the technological and economic change over the long run. *Firstly*, the study here shows that basic driving forces set the stage for the source of GPTs, such as higher democratization, high population and continuous demographic change, high investment in R&D, the purpose of global leadership between great powers, contestable socioeconomic environments with effective/potential threats of belligerent subjects, etc. *Secondly*, an appropriate graphical representation of these drivers of GPTs is given by a fishbone diagram, which is a visualization technique for a comprehensive theoretical framework to represent, systematize and analyse the source of GPTs. This technique of the fishbone diagram can provide fruitful information for the foresight of GPTs that support the economic change over time. Some examples are given by applying the Fishbone diagram to describe the determinants of specific GPTs over time: steam engine and ICTs. Overall, then, fishbone diagram seems to be an appropriate and general technique of graphical representation to systematize and analyse whenever possible, the complex root causes of GPTs for the foresight of these path-breaking innovation in society.

KEYWORDS

General Purpose Technology; Technological Foresight; Source of technical change; Technological Evolution; Evolution of Technology; Fishbone Diagram.

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