Chapter 8
Economic AI Literacy:
A Source of Competitive Advantage

Dirk Nicolas Wagner
https://orcid.org/0000-0003-2370-1742
Karlshochschule International University, Germany

ABSTRACT

This chapter introduces the concept of economic AI literacy as a source of competitive advantage in a world where artificial intelligence (AI) complements and transforms business models. The purpose of economic AI literacy is to allow for enhanced strategic decision making in firms that either offer and/or use AI. Data and information goods, economics of networks, and economic agents in artificially intelligent firms are introduced as basic elements of economic AI literacy. To illustrate application, the case of TensorFlow and related cases are presented. The discussion highlights the strategic relevance of economic reasoning in the light of the expected effects of AI on business transformation.

INTRODUCTION

It is backstage where the new key actor in business prepares for its role. And this is where it will remain while the play changes. It changes with the introduction of Artificial Intelligence (AI) as the new actor who represents a general-purpose technology (Trajtenberg, 2019). Based on a cluster of technologies that includes Machine Learning, Deep Neural Networks, Big Data, Internet of Things and Cloud Computing AI has finally left the research laboratories and begins to rapidly establish itself in business practice, to cross borders between industries, and to create a constant flow of new possibilities on the fly. The play changes because there is a pattern change (Kruse, 2015) in how organizations work with machines. In short, AI assists by providing predictive analytics, it augments by providing prescriptive analytics, and it substitutes human work by fully automating business activity (Lepenioti et al., 2019). It does take over knowledge work but it does so in unprecedented ways. Typical for software, AI operates "behind the scenes" (Jennings et al., 2014, p.85). Not only does its reasoning largely remain a black-box for its users. More often than not, users do not even notice their interactions with an AI, which is for example illustrated by the fact that an ordinary smartphone user is likely to have hundreds of thousands of server

DOI: 10.4018/978-1-7998-5077-9.ch008

contacts per week (Hill, 2019). Protected from foreign eyes, AI uses its place in the cloud to learn. This is a new property for a machine. The learning takes place centrally but with the help of and in the presence of decentralized and massively parallel action. This is highly economical. AI is designed to be highly results-oriented.

A new type of actor who represents a general-purpose technology, who acts behind the scenes and who rapidly learns centrally based on decentralized activity: these are the ingredients for an economic pattern change that poses a substantial challenge to business leaders and to their organizations: How to adopt, co-operate but also compete against a technology that

- interacts with business through an exponentially growing number of sensors and user interfaces, making it omnipresent,
- pulls the strings together centrally in the cloud and without further eye-contact,
- on each encounter puts more knowledge to use, and
- operates more and more autonomously without taking breaks in a highly economical fashion?

Leading tech firms who are at the forefront of AI development for business purposes early on realized that with AI on board machines are no longer 'handled' but need to be 'organized' and 'managed'. They identified the discipline of economics as a puzzle piece to fit in between computer algorithms and business processes and they started to hire economists (Athey & Luca, 2018). This serves to explain the effects of the deployment of AI and to develop constraints as well as incentives for machines to act, coordinate, and collaborate in desired ways. The Economics of Artificial Intelligence (Agrawal et al., 2019) have rapidly gained importance.

This chapter goes one step further. The proposition put forward is that for any business to gain competitive advantage with AI, it needs to further its economic know how about AI, or, in other words, it needs to promote economic AI literacy. This is based on the observation that AI is becoming an omnipresent general-purpose technology which means that organizations are about to enter into decentralized and multifaceted discovery processes to again and again achieve "the adjacent possible" (Koppl et al., 2015) with AI. economic AI literacy enables employees to better understand and to contribute to the AI-based digital transformation of their organization and of the markets in which it operates. According to Penrose (1959) a firm can only grow as fast as its knowledge. Economic AI literacy can be interpreted as an enabling knowledge, as a catalyst that facilitates the evolutionary process of knowledge creation (Beinhocker, 2008) based on the co-creation between man and machine. This can lead to what Malone (2018) describes as "Superminds".

The objective of this chapter is to devise an introductory concept of economic AI literacy. The structure is as follows: In BACKGROUND, an introduction to the key elements that form the basis of a shared mental model (Denzau & North, 1994) is provided and it is discussed how such a mental model can impact on strategy and competitive advantage. It is shown that on this basis two things in one swoop: to be an enabler for good (AI) strategies (Rumelt, 2017), and to serve as an outline for further research on economic AI literacy. In the next section three key ELEMENTS OF ECONOMIC AI LITERACY will be introduced: Data and information goods, economics of networks, and economic agents in Artificially Intelligent Firms. The section ECONOMIC LITERACY IN ACTION uses the case of TensorFlow to discuss how the application of this knowledge can support the strategic development process of organizations. Finally, directions for further research are outlined and a conclusion is drawn.