

Chapter 90

Technodata and the Need of a Responsible Industry 4.0

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ABSTRACT

The great transformation that will face European industry is driven by the need of digitizing the entire value chain around manufacturing for creating competitive advantages to maintain a dominant position in the global economy. This new paradigm is commonly known as Industry 4.0, and it has a significant policy support from the European Commission as well as different member states. However, this transition is full of uncertainties as the digitization of industry creates different concerns about employment, privacy, labor rights, and other issues related with this technological revolution. In this chapter, the authors trace back the origins of Industry 4.0 to the Web 2.0 phenomenon as well as they reflect upon the role of technodata and technofactories in a postindustrial society. Finally, they stress the need to reflect about developing a responsible digitization of industry that will consider societal concerns.

INTRODUCTION

Technological revolutions have been historical sources of great wealth as well as producers of deep societal transformations. New radical technologies like Robotics, Cyber-Physical Systems, Internet of Things (IoT), Artificial Intelligence and many others are favoring a transition to a new industrial revolution that will redefine the role of factories in the economy all over the next coming years. The introduction of digital technologies for automating and monitoring production process will create new routes for innovation, new services and new competitive advantages in manufacturing companies. The European Commission (EC) is promoting this new paradigm throughout what it has been originally coined as “Industry 4.0” in Germany some years ago, for embracing digitization and favoring the transition in factories to business

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models based in high-added value services. This push for digitization in the whole value chain of the manufacturing sector lies in the inability of Europe to compete with U.S. Internet companies and as a way to strength the current sector for assuring the international importance of it in the global economy.

But this transition to a digitized industry is full of challenges as the main role of industry in the economy will be completely redefined, and this will create deep transformations in society. Loss of medium and low skilled jobs, the need of huge investments to acquire technology and maintain it, conflicts between workforce and managers, as well as issues related with privacy, security and new forms of alienation due to the introduction of autonomous technologies in factories are envisioned as non-side effects of this technological revolution. New tensions will emerge in the policy arena as well as in society as the factory is still the place where class struggle happens and already existing power relations will be affected by new forms of control. These societal and ethical consequences of the digitization of manufacturing processes will demand a more collaborative approach to technology design and development, for assuring that the outcomes of this new revolution can be beneficial to a larger part of society and preventing possible non-desired impacts.

In this contribution the authors pay attention at the historical roots of the Industry 4.0, that can be traced back to the origins of Web 2.0 and the platform economy, to understand the value of data in this digitized form of economy to create new innovations based on this new fuel. The text explores how this new type of industry is being promoted by policy makers and the role of technodata as the basis of this new kind of technofactories in the Third Environment is stressed. In addition, the authors underline the need of developing a Responsible Industry 4.0 that will consider and reflect on the views of the different stakeholders that will be affected by these great transformations that are envisioned in the manufacturing business.

Moreover, it is argued that the introduction of these new digital technologies in the factory must be aligned with societal expectations, for assuring the diffusion of the innovations as well as promoting their competitiveness, avoiding further modifications. If this kind of co-responsibility approaches are not considered, the authors predicts that the embracement of digitization in factories can face significant barriers that will deter its implementation. New problems can be raised in the factory in relation with the introduction of these new technologies as well as the experimentation of difficulties in this transition can lead to a lack of competitiveness in the manufacturing sector.

Finally, the authors conclude with a set of a policy recommendations for accommodating the introduction of technological innovations to the social concerns that can be risen up as main stoppers of the Industry 4.0 paradigm. Attention is also posed in the need of developing a much more diverse industry that can prevent biases, inequalities and negative externalities from the adoption of disruptive innovations by different companies. The authors stress the need of a developing a Responsible Industry 4.0 that can be beneficial to society and can pave the way for the digitization of manufacturing, avoiding at the same time, dramatic transformations in economy, employment & welfare.

WEB 2.0 AS THE ONSET OF PLATFORM ECONOMY

In 2004 Tim O'Reilly wrote a famous article describing the new features that were sharing a certain group of Internet companies that rose at this time in Silicon Valley after the dot com crash. These companies, according to O'Reilly, were creating the "Web as platform" paradigm (O'Reilly, 2005b) because they were developing new business models and new technologies that created a "perpetual beta" in software

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