

Chapter 27

Technologies for Sustainability Within the Framework of the Fourth Industrial Revolution

Ingrid Yadibel Cuevas Zuñiga

Instituto Politécnico Nacional, Mexico

María del Rocío Soto Flores

Instituto Politécnico Nacional, Mexico

Ericka Molina Ramírez

Instituto Politécnico Nacional, Mexico

ABSTRACT

The effects of climate change have led to the incorporation of environmentally friendly technologies and the fourth industrial revolution, which is marked a paradigm at the global level since it represents the ways in which intelligent technology, connected, is embedded in organizations as well as the daily lives of people. So, the objective of this research is to identify the main technologies for sustainability in organizations within the framework of the fourth industrial revolution with the purpose to see sustainable development as an opportunity business for the economic, social, and environmental benefits.

INTRODUCTION

Climate change, the scarcity of natural resources, global warming, the concentration of wealth, unemployment, low paid jobs, among other factors have caused a change in the model of production and consumption around the world. In this sense, the environmental crisis has negative effects on the quality of life of the society. In addition, the crisis affecting the economy makes it imperative measures to promote productive development of countries towards more competitive systems but that, in turn, they are sustainable from the point of view of economic, social and environmental, and that is currently a predominant condition to deal with the fourth Industrial Revolution. It should be noted, that this fourth

DOI: 10.4018/978-1-7998-8548-1.ch027

Industrial Revolution is based on the Digital revolution which, represents new ways in which technology is integrated into society and is marked by technological advances emerging in several fields, including: robotics, artificial intelligence, nanotechnology, quantum computing, biotechnology, internet of things and autonomous vehicles (Anderson, 2012).

These technologies have great potential to continue connecting billions of people using the internet to improve the efficiency and effectiveness of the organizations and help to regenerate the natural environment through better management of assets so it is It guarantees the satisfaction of the needs of the present and future. The objective of this research is to identify the main technologies for sustainability in organizations within the framework of the fourth Industrial Revolution. To this effect, is a theoretical review of technologies for sustainability that have arisen in the framework of this revolution in order that organizations to identify those technologies that can be taken to deal with these Digital changes occurring every day faster.

BACKGROUND

The fourth Industrial Revolution refers to the emergence and spread of a range of new digital industrial products and to the development of technologies, especially integrated sensors, so that the intelligent products and devices can communicate and interact each other help to the collection and evaluation of data in real time to optimize the costs and the quality of the production. As well as, robots with greater autonomy and flexibility; and advanced manufacturing techniques, as digital technologies that have been available for some time, but due to reductions in costs and improvements in reliability rates mean that its implementation for industrial applications is now commercially more viable (Forum, Realizing Human Potential in the Fourth Industrial Revolution – An Agenda for Leaders to Shape the Future of Education, Gender and Work, 2017).

The technological revolution leads to the birth of a new type of workers known as knowledge workers. Today the level of information to be handled is infinite, new professionals must be able to work with this wealth of information leaving operating jobs to machines. At this time where the information and technology-related industries are massive and, therefore, knowledge workers have become a very common profile that must learn to manage. The major industries are starting with the adaptation, and digitization of their processes, adopting new technologies.

THE RISE OF THE CIRCULAR ECONOMY AND ITS RELATIONSHIP WITH THE OBJECTIVES OF SUSTAINABLE DEVELOPMENT

Circular economy is a sustainable, restorative and regenerative model that is based on three fundamental principles: use of renewable energy, energy efficiency and uses efficient and responsible for the resources. However, the circular economy supported by the fourth Industrial Revolution can play an important role in the transformation of business models where the development and widespread use of the Internet of things, along with a philosophy of extended liability of the manufacturer during the entire life of the product or service, can unleash the potential of the circular economy, particularly in a world where it is expected that 50 trillion of products are connected to the internet by 2020 (Welford, 1996).

8 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:
www.igi-global.com/chapter/technologies-for-sustainability-within-the-framework-of-the-fourth-industrial-revolution/276836

Related Content

The Redefined Role of Consumer as a Prosumer: Value Co-Creation, Coopetition, and Crowdsourcing of Information Goods

Rauno Rusko (2013). *Production and Manufacturing System Management: Coordination Approaches and Multi-Site Planning* (pp. 162-174).

www.irma-international.org/chapter/redefined-role-consumer-prosumer/70055

Supply and Production/Distribution Planning in Supply Chain with Genetic Algorithm

Babak Sohrabiand MohammadReza Sadeghi Moghadam (2012). *International Journal of Applied Industrial Engineering* (pp. 38-54).

www.irma-international.org/article/supply-production-distribution-planning-supply/62987

New Generation of Productive Workers: How Millennials' Personal Values Impact Employee Productivity in Industry 4.0

Rok Cresnar (2021). *Research Anthology on Cross-Industry Challenges of Industry 4.0* (pp. 1632-1646).

www.irma-international.org/chapter/new-generation-of-productive-workers/276893

Structural Organisation of Industrial Companies

I. C. Dimaand Piotr Pachura (2013). *Industrial Production Management in Flexible Manufacturing Systems* (pp. 1-39).

www.irma-international.org/chapter/structural-organisation-industrial-companies/73721

Grey Wolf Optimization Trained Feed Forward Neural Network for Breast Cancer Classification

Shankho Subhra Pal (2018). *International Journal of Applied Industrial Engineering* (pp. 21-29).

www.irma-international.org/article/grey-wolf-optimization-trained-feed-forward-neural-network-for-breast-cancer-classification/209378