

Chapter 2

Technological Spotlights of Digital Transformation: Uses and Implications Under COVID-19 Conditions

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ABSTRACT

Information management in pandemic conditions involves accelerating the adoption of the digital transformation in manufacturing and service sectors that impact the economy. The risks of maintaining a dismissive view are already visible on the labor and economic side. The chapter presents a review of information and communication technologies, associated with the drive for health-related areas, automotive manufacturing, robots, self-driven cars, and retail sales to conclude with education. In certain scenarios, it leads the reader to look at a set of solutions that address his or her position on the issues addressed in the chapter. The conditions that affect the acceptance of the digital transformation and what adverse effects cause its late inclusion are described.

DOI: 10.4018/978-1-7998-4156-2.ch002

INTRODUCTION

Technology is becoming more and more embedded in our daily activities, and the trends experts observe are those of a world dominated by ultra-modern technologies. Technology leads to dynamic solutions based on immediacy, supported by a set of disruptive technologies that attend several conditions presented in the production of goods and services. Services such as payment of electric energy debts, payment of credit cards, bank transfers, food applications, registration of a hospital appointment, purchase of goods, among many other services, are made through an interface in the last generation cellular phone (whose use is penetrating more and more among the population) that assists us and whose support only requires the use of an application that with 5 or 6 touches on the screen gives attention to the request of transactions of electronic commerce of goods, services, communication with people or companies or machines inclusive, territorial location for the determination of routes of transfer, daily agenda, control of things at home or in the office, and others. This is happening now and since some years ago, with a really incredible technological evolution. The technological dependence in the production and consumption of goods and services will increase and may even be incorporated into the human body to address situations of health risk, preventive medicine, therapy, among others.

This year there is a breakpoint for humanity's worldwide economy and health considerations. The activities were hit because of a COVID-19 pandemic, reduction in the manufacturing production of China down to 38.9% at the beginning of 2020, and the US largest monthly decline in industrial production ever seen since 1946. Manufacturing GDP declined by 14 percent and employment in manufacturing declined by 1.3 million in April (more than 10 percent of total manufacturing employment), meaning a loss of more than 10 years of jobs achieved in the manufacturing industry. This has forced a rapid shift in behavior of the major economies worldwide. COVID-19 pandemic has forced technology, manufacturing, automotive, aerospace and defense companies to leverage information and communication technologies to increase the efficiency of their operations and accelerate the diversification of their business models that are also sustainable in pandemic situations. This is due to reduced response time for maintenance, timely service, and safety as an important consideration in their operations.

COVID-19 pandemic made companies and manufacturing industries, goods and services assess production incorporating safety measurements and efficiency mechanisms in their processes, and use services ranging from the use of online video conferencing to the unfortunately total closure of manufacturing operations. Information and Communication Technologies (ICT) such as remote working solutions and video telephony applications have never been more important than today, but alternative and advanced technologies such as Augmented Reality (AR) and Artificial Intelligence (IA) are right now attending this emergency in different ways and also seeing expanded opportunities.

On the other hand, the investment and acquisitions move to boost high-performance computing and adaptive computing, data processing, and transmission and storage area sectors, made by technology companies this year (cases of AMD-Xilinx and Nvidia-ARM), should be seen as positioning them to cover some of the most important growth segments of the industry, from data centers to gaming, personal computers, communications, automotive, aerospace and defense. At the same time, those acquisitions mean that the age of IA will be more than present and embedded in the processors that are dedicated to do computing from the cloud, smartphones, PCs, self-driving cars and robotics, to edge IoT to be used worldwide (AMD, 2020; Nvidia, 2020).

The above offers an idea of how and where to lead efforts in research, training, human capital development, new opportunities for operational synergies, and the creation of new and innovative sources of

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