

# Organizational Knowledge of Digital Economy in Transformation, in Big Data, and in Internet of Things

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## INTRODUCTION

As it is well known, the management issues, related to planning, searching, production, distribution and delivery of products or services (from a place from their production to a place of their consumption) are expressed by the term ‘Supply Chain Management’ (SCM). Currently, this term is a promised standard that is officially accepted. Modern SCM consists of popular business processes which implement newest technologies and innovative solutions. The main goal SCM is to be highly efficient supply management, when the product is available where and when its consumer needs it.

SCM is implemented as a technology that includes various tools, including artificial intelligence, performing machine learning with cognitive computing, which makes it possible to support constant analytics and transformation between the cyber-physical real environment and the digital space. In fact, SCM provides the transformation of traditional linear supply chains into intelligent, scalable, customizable, and fast delivery networks. Additionally, for ordering the technology to work, two more components are needed: the correct economic business models (under the conditions of the digital economy, it can be named as a joint economy) and mechanisms for providing trusted relations in business (that are grouped around the system of blockage or Internet values). In the chapter, avatar-based supply chains are considered also as an expert knowledge source for smart solutions to develop sustainable urban systems. The avatar-based supply chains as expert knowledge is a new concept that includes planning, searching, production, distribution and delivery of Mkrttchian’s digital avatars from the place of origin to consumption (Mkrttchian & Aleshina, 2017). This kind of supply chains are very different from the traditional one, because they relate to a specific product-expert knowledge, which is formed from electronic data, distributed in the Internet. The data belong to business partners and value-added service providers, operating in a general digital economy paradigm using blockchain technologies (Blockchain..., 2016).

The chapter focuses on analysis of business relations and their integration into sustainable urban systems. The supply chains of the 21st century are more complex and dynamic than ever before. Companies, that form the real value of business and, in general, of competitive global economy, need to improve their management in such aspects as inventory, costs, assets and introduction of new products. The improvement cannot be essential without use of the digital supply chains, which, working together with the technology of blocks, will transform the world of modern logistics. Even largest organizations

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lack the capacity, resources and knowledge to deploy end-to-end information integration in their supply networks. The networks consist of many components, or “supply chain nodes”, that are connected through flow paths. Inventory and products: the use of these flow paths has the ultimate goal of ensuring that customers’ needs are realized in a most beneficial way. Governments and companies have now the urgent need of cooperation to accelerate such integration within the framework of the Digital Supply Chain (DSC) concept, using the principles of joint economy and blockbuster technology. Collaboration in the DSC creates a multi-stakeholder environment for different needs and objectives, in which large companies are integrating with their main suppliers. Even competing companies are forced to cooperate for integrating the entire supply chain.

Value-added service providers play different roles, but their cooperation, supported by the common interests, should establish a common trusted environment. For the success of this kind of joint activity, DSC should offer the company competitive advantages, but for this a number of prerequisites must be realized: intermediate products should be quickly integrated; logistics partners should make deliveries using the tracking and visibility functions; and information and communication technologies (ICT) should be introduced in all the business processes. Joint activities are possible only on the basis of expert knowledge, which can be supplied, for example, by Mkrttchian’s digital avatars (Mkrttchain, 2013).

Within the framework of the Fourth Industrial Revolution, not only the list of end-to-end technologies is changing, but mental and methodological approaches to the development of new scenes are radically transformed. It is especially noticeable in the sphere of urban economy. It is obvious that the actively recovering industry in the coming years will become one of the main drivers of economic growth, which will have an impact on sustainable urban systems. The main driver of breakthrough development in these conditions will be promising fast-growing industrial companies that have the highest leadership potential in global markets. These are domestic private high-tech export-oriented companies, leaders in terms of development rates. Within the rating of Texas, 62 such companies were selected (Mkrttchian, et al, 2019). In 2018 it is planned to select an additional 30 companies. It is these circumstances that determine the relevance of the research in this chapter.

## **BACKGROUND**

The advantages of Mkrttchian’s digital avatars (Mkrttchian et al, 2019) include profitability of services and the creation of value of joint activities that are beneficial to many ecosystem entities (Chenyshenko, Ruzich, 2013), including firms and their suppliers, employees and customers will be discussed below. Development of the avatars, as a special branch of computer science, has been booming in recent years (Arifovic et al., 2010; Dawid & Fagiolo, 2008; LeBaron & Winker, 2008). For the considering problem, the basic model “Triple H Avatars” was proposed in (Mkrttchian, 2013). A parallel trend in the computer science is multi-agent models and methods of computer simulation (Gilbert & Troitzsch, 2005), which are useful for solving such problems as forming an “environment” algorithm, which unites a set of agents or avatars into a system.

The digital avatar supply chain can be defined as a set of avatars of three or more subjects (i.e. organizations or individuals) directly involved in downstream flows of products, services, finance, and / or transfer of information from source to client. This definition emphasizes the role of information flows between firms, especially in business and business areas and process levels. The digital avatar of Mkrttchian refers to the software industry or to the development of programs. As in any production, there are tools in programming that allow you to produce certain parts (blocks), platforms (develop-

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