Chapter 51

Big Data and Simulations for the Solution of Controversies in Small Businesses

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ABSTRACT

The global information society creates data in various formats, and data is stored in many sources. Interest is focused on true story formation with respect to sustainable development. The suitable recommendation is to implement a multidimensional view on big data. Such an approach works with big data on three levels. The basic level represents default activities and analyses for data storage in data warehouse. The advanced level is focused on searching for links between stored data and information sources in the global society, and variable level searches unexpected events based on complex statistics and mathematical methods with the support of artificial intelligence, business intelligence, customer intelligence, competitive intelligence, swarm intelligence. These kinds of activities are important for IT product development such as specification of the road for an adopted methodology, definition of a reference for needed dimensions and phases for IT development, and also as a warning against omissions and mistakes.

INTRODUCTION

General perspective of the chapter is focused on the use of big data and intelligence in the field of information technology. Information technology (IT) supports the majority of the realized activities. The press is focused on time and quality. There are also competitions, customer preferences and downward pressure on prices and costs. In this situation, new products and services have to address both existing and new customers. Such innovations actively use information technology and available information from the Internet. Good and bad advice, experiences or requests are immediately available for everyone via successful story. (Concessao, 2016) The behavior of individuals in a global information society reveals similarities with regard to the collective behavior of animals in nature. Swarm intelligence provides inspiration for various fields such as economics, biology and also computer science.

The global information society creates data in various formats and data is stored in many sources. Data (big data) is everywhere around us. The well-known databases (Barbucha et al., 2015) are default data source, but there are many other sources such as the Internet, e-mails, chats, and also personal notes in PDF or text files. The volume of data is as large as the ocean or the universe. Users of information technology swim in the data without lifebuoys in all companies and organizations. Everyone wishes to get knowledge immediately in the needed format, but knowledge is not data. There are difficulties that cause ambiguous tasks, unrealistic expectations, faulty data or inadequate procedures and processes. The special problems create a large volume of available data.

The objective of interest is native support of sustainable development based on big data and intelligence in the field of information technology. (Acharjya et al., 2015) In this situation, there is a spectrum of well-known approaches and the fields that are oriented on big data and intelligence such as artificial intelligence, business intelligence, competitive intelligence, customer intelligence, swarm intelligence and also computational intelligence. At first glance, working with data must use all suitable approaches for correct data analysis with respect to sustainable development. Sustainable development is important for supporting society's continuous development without crises. (World Development Report, 2015) The question is "How can be solved existing problems responsibly?" The easy way is to depend on governments or luck. Another way is to merge power of mankind based on cooperation and communication. In this situation, big data brings good results.

BACKGROUND

Working with big data requires optimal IT support, skills of IT users, and more predictive analytics. Sense and simplicity are in the forefront. Interest is focused on true story formation. For these goals, there is computational intelligence bringing IT power to problem solution. The basic step is correct problem formulation in a complex view. CPU speed, memory size, disk volume, and network connection are not critical elements. Information technology has enough resources to work with big data. (Information Technology Market Reports, 2015) The question is to find the best data for the required analysis and to create a suitable story for the given reality. The main role of computational intelligence must be focused on helping with data analysis and predicting further development to break unexpected conditions in society. (Covington, 2016) Market competition creates other hard requests on realized activities, computers and their software, and also IT users. We need a solution that is better, faster, more user-friendly, more complex, and more predictive.

Regardless on the wide spectrum of hardware, software, available methods and verified methodologies, there are big data projects that end with mistakes. There is contradiction between expectations and reality. IT users rely on information technology as a unique tool supporting realized tasks and processes for solving existing problems, but they are often disappointed over achieved results. IT users often must say "It doesn't work." An active solution takes inspiration from nature, specifically swarm intelligence with links to business intelligence. In many cases, foundation work is simulation. The benefit is easy creation and modification of simulations without demands on finance, material, or human resources.

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