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Application of Big Data Technology in Knowledge Transfer Process between Business and Academia

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Abstract

New data and information are being constantly produced as a result of technological development. The data and information are used by many companies as a source for creating knowledge in their sphere of business. The important part of the knowledge creating process is both adequate amount of relevant data, and an ability to transform this data to information. Various technologies are helpful, such as Big Data technology. Mostly big companies with sufficiency of money dispose of Big Data by reason of its complexity and significant expenses in terms of maintenance, specialized staff, technology infrastructure etc. Constantly changing demands of customers together with a strong competitive environment is forcing companies to innovate, for instance by designing new products, improving internal processes, or implementing new technologies. By obtaining such innovation is very helpful cooperation with research and development (R&D) institutions from academia. Universities are in a large extent dealing with R&D activities, on which companies don't have capacities, but the results from these R&D activities are for companies interesting and mostly usable in practice. The purpose of this paper is following findings obtained from analysis of the knowledge transfer and Big Data theory finding and describing the possibility of connecting these two areas in practice. The paper is focusing on knowledge transfer creation within cooperation of companies and universities through access for university to company's database during contract research with usage of Big Data. Knowledge of cooperating subjects is filling up, deepening and verifying through united access to collecting, storing, processing and interpreting available data, whereby emerging knowledge transfer between cooperating subjects.

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1. Introduction

The information context of the modern organization is rapidly evolving in the face of intense global competition. Decision making of managers is on the present largely depend on timely, accessible and relevant information within the context of solved problem. The most comprehensive information represent knowledge for managers. The knowledge can be obtained either from own resources of the organization or from the available data. Continuous development of information and communication technologies gave rise to new systems and platforms that are generating plenty of data every second. The data can be potentially carrier of important information necessary for the creation of subsequent knowledge related to the problem. Thanks to the openness of the Internet and its interconnection with almost all devices both at consumers or businesses, unstructured data are gaining ground. The unstructured data are such data that do not have a specific structure, and which are not stored in the relational database model. Large amounts of unstructured data have different characteristics from data generated by the own systems of organization or academia, and their database structures (e.g. data warehousing) and their tools for data management cannot efficiently process and analyze these volumes in terms of reasonable time and cost perspective (Dolak , 2011). This was the main reason why BigData technology arose. By integrating an enterprise solutions of BigData with existing information systems and the systems of the academic community, the organization can obtain new tools through which can be obtained relevant information from unstructured data. This information could essentially affect the creation of knowledge, which the scientific-research institution carries out in the given field. Creation of new knowledge is useful both for academia because it can move forward its research or be a basis for new publications, and for organizations from business because it can be helpful by creation of innovation or by solving some existing problems in the organization.

2. BigData

In terms of information and communication technologies BigData represent rapidly changing and expanding field. Large data are connected primarily with modern, trendy technologies that generate a lot of data, or use a lot of data, such as semantic technology, sound and voice processing, and the Internet of things. Therefore, it is very difficult to clearly define the term BigData. Another reason are also temporal changes in terms of rapid technological development, i.e. data which represented in the nineties large data difficult for processing, can be today processed by conventional computers or mobile devices because of technology development (Cerny, 2013). Large data are liberally defined term that describes a large amount of complex data sets, and at the same time describes innovative technologies for the collection and storage of data quantity (Kim, 2014). Nowadays BigData technology represents a modern way of working with the information, the meaning of which many organizations undervalue. The term BigData itself can be for management misleading, as evidenced by the survey of IBM, in which 18 % of managers see the BigData only as larger amounts of data, and 8 % as a new term, or the term denoting a big amount of data (Levarsky, 2013). Generally it is possible to talk about the large data in three basic meanings. First it is data too extensive for us to easily and in a reasonably short time process (e.g. data about the gravitational potential of each star, located in two galaxies that are currently exposed to precipitation). Second, the unstructured data (e.g. browsing data via text, video or audio files), and finally data by which we need information in almost real time (i.e. traffic data from thousands of cameras and satellites) (Cerny, 2013). BigData represent data with a very large size, usually to such extent that brings significant logistical challenges for handling and managing them (Oxford English Dictionary – BigData). BigData relate to data files, whose size within the current database systems is above their possibilities of capturing, storing, processing and analyzing (BigData: The next frontier for innovation, competition, and productivity). Large data relate to the large amount of data that have been collected over time, and that is difficult to analyze and handle by using common tools for a unified database service. Data in the field of market trends, manufacturing, medicine and science are being analyzed. Types of input data are business transactions, e-mail messages, photographs, camera records, reports of activities, unstructured text e.g. from blogs and social media, as well as large amounts of data, which can be generated by various sensors (Definition of: BigData). BigData is a term describing an exponential growth and availability of data, both structured and unstructured. BigData may have the same meaning for business and organizations, which has the Internet today, because this data may lead to more precise analyses (BigData. What is it & why it matters). The term BigData refers to the large amount of information