

THE EMERGENCY OF A FOURTH RESEARCH PARADIGM AND ITS RELATIONSHIP WITH THE MANAGEMENT OF THE 21st CENTURY

La Emergencia de un Cuarto Paradigma de Investigación y su Relación con la Gestión del Siglo XXI

Jairo Alberto Cárdenas

INTRODUCTION

A few thousand years ago our knowledge was based on the description of natural phenomena, which was supported on experimental science, a hundred years ago our knowledge evolved to the level of the definition of theories, which were supported by the theoretical sciences, recently, our knowledge was based on computational sciences, which used and continue to use the simulation of complex phenomena. Today, we have the fourth paradigm “*The Science of Intensive Data*”.

That is, the large volume of data that flows through the networks, the information systems, the instruments in the factories, those that are captured directly or indirectly through interaction with the human being; flood the vast silos or data repositories. Therefore, corporations, companies and organizations have the great challenge to analyzing and processing this data, moving data to information and transforming information into knowledge.

Therefore, the objective of this essay is to illustrate the emergence of the fourth research paradigm and its relationship with the management of the 21st century, its challenges and opportunities to develop a competitive strategy that ensures permanence in the changing business world.

THE SCIENCE OF DATA, THE CHALLENGE OF MANAGEMENT

According to Porter (1980), the managers of the 21st century have many challenges and paradigms to deal with, from globalization, the integral management of human talent, sociopolitical factors and constant changes in the monetary value. However, the management of intensive data is the great challenge of management. Many questions are revealed with this paradigm: *What to do with the data? How do we analyze them? How do we transform this data into information? How do we transform this information into knowledge?*

Faced with these questions, computer science has tried to provide an answer, and offers a set of tools and technologies to support data federation and collaboration. These tools and technologies are commonly called “*Tools for Large Data Analysis*”. In the 2016 Forrester report, the main ten technologies are established that help companies with the processing of intensive data, these tools include, among others, predictive analysis, search and discovery of knowledge, virtualization, integration and data preparation. These tools help companies and organizations to generate value and reputation in the market due to the adoption of these emerging technologies.

KNOWLEDGE IN THE MANAGEMENT CONTEXT

In the learning organizations, knowledge learned, transferred and secured is the primary goal of knowledge management. But in the management context, learning requires three key infrastructures: technical, structural and cultural. However, in the appropriation of knowledge the technical infrastructure is made up of technology, which is the dimension that supports part of knowledge management that includes business intelligence, collaboration, knowledge discovery, distributed learning, mapping of knowledge, the generation of opportunities and the security of knowledge.

In relation to the treatment of the intensive data, the tools of big data analysis must interface with the technical infrastructure to allow the flow of data and information and then to knowledge.

PRAXIS IN THE MANAGEMENT OF THE 21ST CENTURY

In this 21st century, knowledge plays a decisive role in the information revolution, however, for the management of the 21st century, the praxis to manage knowledge is based on selecting the correct information from different sources and transforming it into knowledge that allow sustainable growth by creating new markets for customer service. The challenge of the management of the 21st century is to go further, to move from knowledge to wisdom, or intuition based on experience. *Wisdom is very similar to tacit knowledge.* (Tobin, 1997).

Davenport and Prusak, (2001), *states that all healthy organizations generate and use knowledge.* As organizations interact with their environments, they absorb information and subsequently convert it into knowledge. Nonaka and H. Takeuchi, (1999), *focuses on the ability of a company to generate new knowledge, disseminate it among the*

members of the organization and materialize it into products, services and systems. The main challenge of knowledge management is managing content effectively, facilitating peer collaboration, helping workers connect and find experts in an agile and effective way; also helping the organization to learn and make decisions based on data, information and complete knowledge, valid and well interpreted. The organization that efficiently learns and applies acquired knowledge evolves as a knowledge society, which finally integrates internal and external knowledge networks for its benefit.

Finally, smart organizations use their knowledge to: Help drive strategy, solve problems quickly, disseminate best practices, improve knowledge incorporated in products and services, fertilize ideas and increase innovation opportunities.

REFERENCES

- Davenport, T.; Prusak, L. (2001). *Conocimiento en Acción. Cómo las organizaciones manejan lo que saben.* Buenos Aires: Pearson Education.
- Nonaka, I.; Takeuchi, H. (1999). *La organización creadora de conocimiento.* México: Oxford University Press
- Press, G. (2016). Top 10 Hot Big Data Technologies. [Documento en línea] Disponible: <https://www.forbes.com/sites/gilpress/2016/03/14/top-10-hot-big-data-technologies/#1051074965d7>. [Consulta: 05/03/17].
- Porter, M. (1980). *Competitive strategy.* New York: Free Press.
- Tobin, D.R. (1997), *The Knowledge-enabled Organization,* AMACOM, New York, NY.

ABOUT AUTHOR

Jairo Alberto Cárdenas, Professor and Researcher at the Corporación Universitaria Minuto de Dios, Cúcuta, Colombia. Bachelor

of Science in Computer Sciences, Master Degree in Design, Management and Project Management, Master Degree in Business Administration, PhD in Management. Email: jairo.cardenas@uniminuto.edu, ORCID: 0000-0003-1816-7872, ResearcherID: M-6820-2017.