Chapter 55

Computational Business Intelligence, Big Data, and Their Role in Business Decisions in the Age of the Internet of Things

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ABSTRACT

The evolution of the big data and new techniques related to the processing and analysis of large databases is revolutionizing the management of companies in the age of the Internet of Things (IoT). In this chapter, we examine the possibilities of big data to improve the services offered by companies and the customer experience and increase the efficiency of these companies. Companies must accept the challenge of self-assessment and measure the barriers that threaten to prevent them from reaching to get the maximum potential derived from big data and analytics. The combination of big data and computational business intelligence will change completely processes, logistics and distribution strategies, the choice of marketing channels and any aspect of the production and marketing of products and services. A case of GE is presented to showcase the use of the IoT and big data. All companies, regardless of size or sector, will improve their business operations due to big data generated from the social media and IoT applications and its use in computational business intelligence.

INTRODUCTION

The terms computational business intelligence and big data make reference to the trend of the advancement of technology that have opened the doors to a new approach to understanding and describing huge quantities of data that would take too long to load into a relational database for later analysis

There is hardly any area of economic activity in which the use of big data is not generating business opportunities and adding value. Exploiting the potential of big data is not just a technological achievement, but actually represents an organizational challenge since companies must change the way they make decisions regarding their business processes. Companies must put aside making decisions based on intuition, and learn to analyze information reliably and create structures and new roles that may affect the current balance of power.

While best performing companies are in an advanced position in their learning curve, with regard to the development of analytical competition, a lot of companies are still at the beginning of this process and must cope with various difficulties.

In this chapter we will refer briefly to the main challenges associated with the use of big data and computational business intelligence for business purposes. We will then discuss the implications of big data to the Internet of Things (IoT). We will present the case of GE, which has managed to develop a successful strategy based on big data and the IoT. We will use this example to illustrate the characteristics of the organization that favor the development of its analytical capacity, the ability of the organization to generate and use big data, computational business intelligence, and the IoT to improve performance. Finally, we will discuss how the development of analytical capacity in the age of the IoT is not limited to few companies, but instead can be taken in traditional companies and relatively small, with benefits for their performance.

BACKGROUND

Regardless of the fascination that arise the incredible figures of data that are constantly produced, big does not mean the same thing in a large organization, which can manage multiple petabytes, or in a small, where some terabytes can represent a problem of management.

Obviously the complexity and the needs change for the different sizes, but the opportunities for improvement are real in all companies. One of the most common examples to explain the advantages that the medium-sized companies can obtain from big data is a sales company online that is dedicated to a particular product (Barney, 1991). The navigation study that follows consumers and the activity carried out in social networks can give very useful information about the consumption habits of customers (actual and potential) and the brand image that has built between them, and layout, product range and marketing strategy which will be more successful.

But the information obtained through the analysis of big data is not only useful to understand customers; the internal functioning of organizations can also be optimized. Continuing the example of the small e-commerce company, the study of the data obtained from supplier relationships, from internal processes, etc. can highlight the problems of communication between departments, reduce the cost of purchasing department and optimize the distribution process (Purcell, 2013).

Actually the secret behind the Big data and computational business intelligence is not new. To find the causes of the weak and strong aspects of any business has always been an objective for companies

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