Chapter 10

Industrial Informatics:
Asserrtion of Knowledge from Raw Industrial Data

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ABSTRACT

Correct and timely access to business information is the key to success in industry. However in industry, data is generated on daily basis and increases exponentially. Therefore, managing it is a challenging task for every organization. To deal with this phenomenon of information overload, organizations are in dire need to find and set up potential means for the analysis of raw industrial data (i.e. texts) and draw necessary information from it. This information can result in knowledge and knowledge leads towards wisdom, the essence of every business. This chapter is concerned with the use of knowledge management systems to cater information overload hassles, the organizations are facing today. As a solution, a detailed study of currently existing open source data and knowledge management systems is conducted. Hence, this chapter discusses the state of the art tools and technologies in this domain, and highlights the need and importance of semantic applications for industrial data processing.

INTRODUCTION

Extraction of relevant knowledge, from the gathered information, is the most significant and effectual factor for any business to run successfully and to compete in current era. However the

data and information generated in most industrial organizations, recently, is not in proper format to build knowledge base for these organizations. Generally, industrial data exists in unstructured format. So companies need to perform many activities to manage this data and information, and manipulate it to generate useful knowledge. Knowledge worth more than information and

Figure 1. Process of knowledge generation and usage
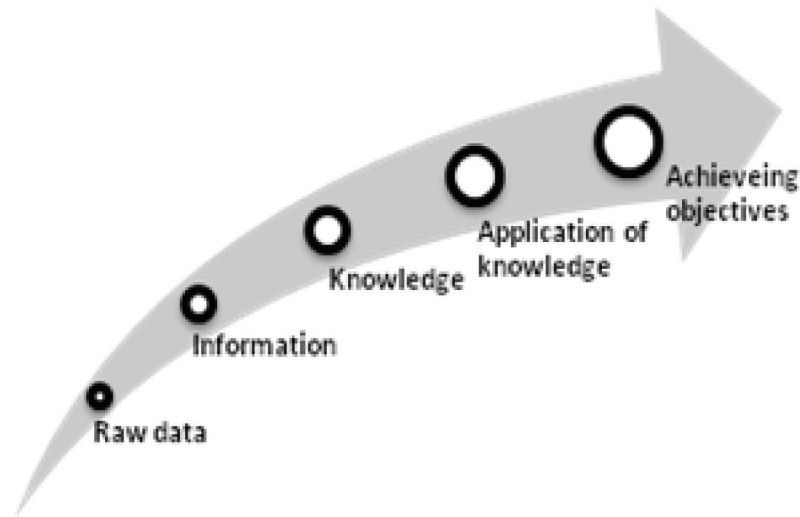
the ability to make precise decisions based on the available knowledge has the highest value. In industry, knowledge can be extracted from a vast source of resources of data and texts including web pages, local and distributed repositories, databases, files etc. Thus knowledge generation and management is the central focus for the success of any industry. This knowledge can play its role as a valuable asset in organization's policy making and can result in improved resource management, business production or revenue generation.

However, as a significant portion of industrial data is not structured, it is not easy to find, access, analyze, or use this data to locate pieces of useful information and extract meaningful knowledge from it. This requires the transformation of unstructured data into organized information and thus the information leads towards knowledge generation, discovery, and extraction, generally covered under the name of knowledge management.

The process of knowledge management for industrial data can be carried out either manually or by some automated way. However, organizing the unstructured industrial data manually requires excessive resources in terms of man-power, time, equipment, money etc. Contrarily, automatic techniques help in better and efficient utilization of the available resources in lesser amount of time. Therefore, unique analytical tools are required to assert intelligence from industrial data by automatically understanding and analyzing it.

Knowledge generation covers the discovery and delivery of quality information to the user, eliminating the irrelevant ones and focusing on the relevant pieces of information. Higher the relevancy of extracted knowledge, the underlying knowledge management system will be more efficient and reliable. In industry, the knowledge management efforts help in achieving the business objectives such as improved performance, competitive advantage, innovation, the sharing of lessons learned etc. It follows the path from raw data to fine knowledge generation and then its application to diverse industrial domains, as shown in Figure 1.

The process of knowledge management starts by taking the raw facts and leads towards information. Information is basically understanding of data pieces within a given context. It deal with what, who, where, when etc. Whereas knowledge is the manipulation of information in such a way that, it can deal with the "how" part. It comprises of all the strategies, practices or approaches that are incorporated to perform a given undertaking.

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