Semantic Technologies for Business Decision Support

Discovering meaning with NLP Applications

Francesca Esposito

Abstract

In order to improve and to be competitive, enterprises should know how to get opportunities coming from data provided from the Web. The strategic vision implies a high level of communication sharing and the integration of practices across every business level. This not means that enterprises need a disruptive change in informative systems, but the conversion of them, reusing existent business data and integrating new data. However, data is heterogeneous, and so to maximise the value of the data it is necessary to extract meaning from it considering the context in which they evolve. The proliferation of new linguistic data linked to the growth of textual resources on the Web generate an inadequacy in the analysis and integration phases of data in the enterprise. Thus, the use of Semantic Technologies based on Natural Language Processing (NLP) applications is required in advance. This study arises as a first approach to the development of a document-driven Decision Support System (DSS) based on NLP technology within the theoretical framework of Lexicon-Grammar by Maurice Gross. Our research project has two main objectives: the first is to recognize and codify the innovative language with which the companies express and describe their business, in order to standardize it and make it actionable by machine. The second one aims to use information resulting from the text analysis to support strategic decisions, considering that through Text Mining analysis we can capture the hidden meaning in business documents.

In the first chapter we examine the concept, characteristics and different types of DSS (with particular reference to document-driven analysis) and changes that these systems have experienced with web development and consequently of information systems within companies. In the second chapter, we proceed with a brief review of Computational Linguistics, paying particular attention to goals, resources and applications. In the third chapter, we provide a state-of-the-art of Semantic Technology Enterprises (STEs) and their process of integration in the innovation market, analysing the diffusion, the types of technologies and main sectors in which they operate. In the fourth chapter, we propose a model of linguistic support and analysis, according with Lexicon-Grammar, in order to create an

enriched solution for document-driven decision systems: we provide specific features of business language, resulted from experimental research work in the startup ecosystem.

Finally, we recognize that the formalization of all linguistic phenomena is extremely complex, but the results of analysis make us hopeful to continue with this line of research. Applying linguistic support to the business technological environment provides results that are more efficient and in constantly updated innovating even in strong resistance to change conditions.