

# Chapter 8

## Economic Impact With a Knowledge Management Trend for Manufacturing Domain

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### **ABSTRACT**

*The manufacturing scenario in all countries is very dynamic, and it is necessary to develop strategies and technology that adapts to these changes. Consequently, if we apply cutting-edge technology such as semantics and ontologies jointly with knowledge management techniques, we'll approach developing applications with high adaptability to dynamic environments such as manufacturing companies. In this chapter, the authors show the initial state of KM<sup>3</sup> model. Additionally, they describe concrete result on training ontology, and at the end, an information retrieval using these ontologies is shown.*

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# 1 INTRODUCTION

With the onset of the Internet and World Wide Web and Semantic Web, traditional pillars of economic power (i.e., capital, land, plant, and labor) are no longer the main determinants of business success. Companies are beginning to realize that their competitive edge relies on the brainpower or the so-called “intellectual capital” of their employees and management. The manufacturing domain could benefit from intersection between Knowledge Management, Semantic Web and ontologies research efforts.

The Semantic Web (Hendler, J., et al. 2001) is a new field of research, and according to the World Wide Web Consortium (W3C) the Semantic Web is defined as “an extension of the current Web in which information is given well-defined meaning, better enabling computers and people to work in cooperation. It is based on the idea of having data on the Web defined and linked such that it can be used for more effective discovery, automation, integration, and reuse across various applications”.

The application of the Semantic Web to the Manufacturing domain is completely new; it features knowledge representation, knowledge engineering, database design, information systems, database integration, natural language understanding, information retrieval and semantic portals, among others. The Semantic Web is the infrastructure upon which all intelligent applications will be built. Within the objectives of the Semantic Web the ontologies play an important role.

Knowledge Management is concerned with the representation, organization, acquisition, creation, usage, and evolution of knowledge in its many forms. To build effective technologies for knowledge management, we need to understand how individuals, groups and organizations use knowledge (Medina-Quintero, et al., 2018). Given that more and more knowledge could be encoded in ontologies and semantic applications, which can effectively search through databases, files, web sites.

IOT technologies are now part of manufacturing sector (Jabbar et al., 2022) transforming processes. This research is aimed at developing an ontology driven approach supporting Knowledge Management to help organizations capture, preserve, re-use, and distribute engineering and production data, information, and their know-how related to their core

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