Chapter XIII
Formalizing and Leveraging Domain Knowledge in the K4CARE Home Care Platform

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ABSTRACT
This chapter proposes an agent-based architecture for home care support, whose main capability is to continuously admit and apply new medical knowledge entered into the system, capturing and codifying implicit knowledge deriving from the medical staff. Knowledge is the fundamental catalyst in all application domains, and this is particularly true especially for the medical context. Knowledge formalization, representation, exploitation, creation, and sharing are some of the most complex issues related to Knowledge Management. Moreover, Artificial Intelligence techniques and MAS (Multi-Agent System) in
health care are increasingly justifying the large demand for their application, since traditional techniques are often not suitable to manage complex tasks or to adapt to unexpected events. The chapter presents also a methodology for approaching medical knowledge management from its representation symbolism to the implementation details. The codification of health care treatments, as well as the formalization of domain knowledge, serves as an explicit, a priori asset for the agent platform implementation. The system has the capability of applying new, implicit knowledge emerging from physicians.

**INTRODUCTION**

The work presented in this chapter is part of the K4CARE\(^a\) (Knowledge for Care) European project, whose aim is, among the others, to provide a *Home Care Model*, and develop a prototype system based on Web technology and intelligent agents. The percentage of old and chronically ill people in European countries is putting very heavy economic and social pressure on all national health care systems. This problem can be somehow enlightened if home care services are improved and used as a valid alternative to hospitalization. In the context of the K4CARE project, we are targeting a software engineering method that automates the development of an agent platform for this knowledge-intensive application. The intended solution has two basic features. On the

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**Figure 1. Knowledge-driven architecture of the home care platform**