

# Spring Is Here! Will The Semantic Web Provide A Revival for Artificial Intelligence?

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Artificial Intelligence (AI), as a subfield of computer science, has the strange characteristic that many technologies that have had their beginnings as “AI technologies”, once mature enough, are no longer considered AI (for example, “expert systems” in the 1980’s were often based on the application of *production rules*, but today nobody considers rule systems as AI – rather, many people now talk about “business rules”). Despite the progress with many technologies, the AI “boom” of the 1980’s ended in the perception that there were many broken and unfulfilled promises; as a consequence, this gave a start to the so-called “AI Winter”.

Over the years, without being branded as “AI”, numerous applications have emerged that quietly make use of those AI technologies that have matured to the point of being commercially applicable.<sup>1</sup> Finally, the late 1990’s saw the emergence of a discussion about the possibility of an “AI Spring”.<sup>2</sup>

The Semantic Web, ever since making its broad public debut about five years ago, has served to introduce more and more people to some classical AI technologies such as frame- and logic-based knowledge representation. As a consequence, *reasoning* (logical inference) may well be the next AI technology that is about to cease being AI.

A lot of the Semantic Web research (and standardization) has focused on representation and reasoning, and yet the full-blown realization of the Semantic Web vision will require the application of a much broader range of AI technologies, such as *multiagent systems*, *reasoning about uncertainty*, *constraint satisfaction*, and *automated planning* (only to name a few); to bootstrap the semantic annotations for existing content, *natural language* technologies may also be needed.

It may be that the future of the Web and that of AI are inextricably linked. This is not only a question of research, but also that of education and training. By and large, AI technologies are not part of the “arsenal” of mainstream software developers, yet – assuming wide adoption and deployment of the Semantic Web – these are the people we expect to build the future (Semantic) Web applications.

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<sup>1</sup>e.g., “Spring Comes to AI Winter”, *Computerworld*, February 14, 2005.

<sup>2</sup>e.g., <http://www.aaai.org/Conferences/National/1999/aaai99.html>.