

Tiger in a Cage The Applications of Knowledge-based Systems (1993)

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Some pioneers of Artificial Intelligence dreamed of the super-intelligent computer, whose problem solving performance would rival or exceed human performance. Their dream has been partially realized, for narrow areas of human endeavor, in the programs called expert systems, whose behavior is often at world-class levels of competence. Their dream was partially transformed by programs that give intelligent help to humans with problems (rather than perform super-intelligently). These are called knowledge systems.

Because knowledge is of such central importance to late 20th century firms and economies, these two types of knowledge-based computer systems offer great economic and competitive leverage. The systems offer remarkable cost savings; some dramatically "hot selling" products; great return-on-investment; speedup of professional work by factors of ten to several hundred; improved quality of human decision making (often reducing errors to zero); and the preservation and "publishing" of knowledge assets of a firm. These benefits will be made vivid by descriptions of knowledge-based systems of prominence in 1993.

These stories of successful applications, repeated a thousandfold around the world, show that knowledge-based technology is a tiger. Rarely does a technology arise that offers such a wide range of important benefits of this magnitude. Yet as the technology moved through the phase of early adoption to general industry adoption, the response has been cautious, slow, and "linear" (rather than exponential). The tiger is in a cage, and we do not yet understand what the bars of the cage are made of. Are there fundamental flaws in the technology that are somehow not evident in "best practice" systems? Is there a specific set of technology transfer problems that arise with knowledge systems but not with other kinds of systems? It is important to the economy to free this competitive tiger, but to do so we must understand its cage.