

Intelligent Building as a Pragmatic Approach towards Achieving a Sustainable Environment

Authors : Zahra Hamedani

Abstract : Many wonderful technological developments in recent years has opened up the possibility of using intelligent buildings for a number of important applications, ranging from minimizing resource usage as well as increasing building efficiency to maximizing comfort, adaption to inhabitants and responsiveness to environmental changes. The concept of an intelligent building refers to the highly embedded, interactive environment within which by exploiting the use of artificial intelligence provides the ability to know its configuration, anticipate the optimum dynamic response to prevailing environmental stimuli, and actuate the appropriate physical reaction to provide comfort and efficiency. This paper contains a general identification of the intelligence paradigm and its impacts on the architecture arena, that with examining the performance of artificial intelligence, a mechanism to analyze and finally for decision-making to control the environment will be described. This mechanism would be a hierarchy of the rational agents which includes decision-making, information, communication and physical layers. This multi-agent system relies upon machine learning techniques for automated discovery, prediction and decision-making. Then, the application of this mechanism regarding adaptation and responsiveness of intelligent building will be provided in two scales of environmental and user. Finally, we review the identifications of sustainability and evaluate the potentials of intelligent building systems in the creation of sustainable architecture and environment.

Keywords : artificial intelligence, intelligent building, responsiveness, adaption, sustainability

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