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# Strategic decision-making for intelligent buildings: Comparative impact of passive design strategies and active features in a hot climate

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### Abstract

In the past years, there has been a growing interest among architects and entrepreneurs to include intelligence in buildings, as a way for achieving energy-efficient buildings that comply with stringent energy codes and national goals of reducing dangerous emissions, together with improving corporate image.

The aim of this paper is to explore the influence of incorporating intelligence in buildings in hot climates, through the perspective of energy consumption and user comfort with an emphasis on lighting. The paper will show how decisions taken in the early design stages can affect those of later ones. Moreover, it will try to clarify how much building

stages can affect those of later ones. Moreover, it will try to clarify how much building performance depends on early smart architectural design decisions (passive design strategies) or if it can be left exclusively to later intelligent technological devices (active features).

By means of computer energy modelling, a prototype office unit is used to evaluate energy performance and visual comfort in three parametric series. The first one is the result of the incorporation of active features alone, the second one is guided by intelligent passive design strategies, and the third one is the combination of both approaches. Results show that a truly intelligent building needs to be the product of a design process that incorporates intelligence in all its stages while taking advantage of technological innovations.



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## Keywords

Intelligent buildings; Facades; Energy efficiency; Passive design; Active features; Hot climate

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