Factsheet

Definition and Simulation of Occupant Behavior in Buildings

EBC ANNEX 66

Occupant behaviour is a key issue for building design optimization, energy diagnosis, performance evaluation, and building energy simulation. It contributes significantly to building energy use. Before this project, general understanding of occupant behaviour was quite limited both in terms of building systems design and energy retrofit, leading to inappropriate over-simplifications. Existing studies on occupant behaviour, mainly from the perspective of sociology, lacked in-depth quantitative analysis. Although there are many groups worldwide studying occupant behaviour, often in isolation, the behaviour models created so far have often been inconsistent, with a lack of consensus about common terminology, good experimental design and modelling methodologies.

PROJECT OBJECTIVES

1 identifying quantitative descriptions and classifications of occupant behaviour;

2 developing effective calculation methodologies of occupant behaviour;

3 implementing occupant behaviour models with building energy simulation tools;

4 demonstrating the occupant behaviour models in design, evaluation and operation and optimization by case studies.

Due to the complexity and the great diversity in behaviour often encountered, it is prerequisite for researchers to work together to define and simulate occupant behaviour in a consistent and common way. International cooperation is particularly important for both knowledge discovery and data sharing.
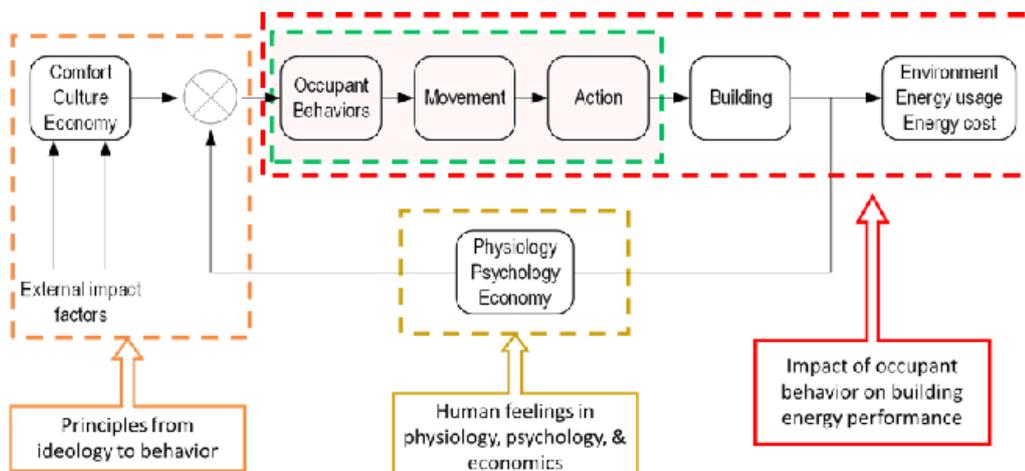
Occupant behaviour influences building systems by movement or actions and further determines the building indoor environment and energy use. Both the indoor environment and energy use in turn affect occupant behaviour through psychological, physiological and economic factors together with several external factors like comfort and culture.

ACHIEVEMENTS

This project set up a standard occupant behaviour definition platform, established a quantitative simulation methodology to model behaviour in buildings, and developed an understanding of the influence of behaviour on building energy use and the indoor environment. How to quantitatively describe the influence of occupant behaviour on building performance and how to analyze and evaluate the impact of occupant behaviour in buildings are fundamental scientific questions.

The following reports has been published as the official project deliverables: Final report - Definition and Simulation of Occupant Behavior in Buildings