In the pre-questionnaire the inhabitants were questioned about their approach to comfort levels in the buildings and how they achieve comfort. In the scenario based tasks, the inhabitants were provided with the interactive visualization and asked to perform tasks for the following days: a typical cold clear winter day, a hot clear summer day and a cool rainy day (typical for the Vancouver climate). These tasks were semi-structured questions on how the information helps their decision or actions taken. Lastly, in the post-questionnaire the inhabitants were asked to give feedback on the interactive visualization design.

In the three proposed models, “I feel” was highly preferred as it relates to the inhabitants sense of comfort and provides them with comparisons of possible options with cost. “What if?” model was the least preferred, as they were not interested in doing individual enquiries. Few participants mentioned that they would explore it for learning and play. Finally, “if buildings could talk?” participants found that it would be annoying to receive constant notifications. On the other hand participants said it would be useful to set their comfort and energy threshold in relation to costs.

Participants Feedback

“I think the I feel will be easier for children; I would say that the selections are faster and quicker but then if you are teaching for learning purposes, that one (if buildings could talk) would be good for children.”

“I think if buildings could talk is the last for me because if it’s getting cold in here, I already know that.”

“I like the cost comparisons where you can click on it and it shows you here are the ways you can save it.”

“First I want to plan everything (What if model), the second if I don’t want to think about that, it can remind me when I need to do something (If buildings could talk).”

“I like the idea of knowing what happens if I do this (What if model). The other one is kind of like my feeling, and I want to feel this way even though I am feeling that way now. I can change the feeling. But that feeling doesn’t solve the economic problem and all of the risk.”

Inhabitants do not comprehend the effects of their interactions with building systems and elements, in relation to comfort and energy usage, because data on both usage and control is not visible. Inhabitants experience discomfort have multiple options from which to choose, but have insufficient information about the effect these options would have on energy usage and comfort. There are other factors as shown in the figure above.

How do designers perceive inhabitants interaction?

Current energy modeling tools considers occupants as scheduled, fixed or ruled based. As occupants’ interaction with and usage of buildings are complex, simplified models are typically used.

This results in large gap between the predicted energy consumption and actual energy usage in the buildings. Post occupancy evaluation and literature study has revealed that occupancy hours/schedule; expectations of comfort, plug loads, life style, available control, and behavior patterns are cause for the difference.

How do people interact with buildings?

Scenario: “I feel very warm”

When Jane reached home after exercise, she finds the room temperature very warm.

“I am always hot and stuffy, and want the windows open. But Debbie, who sits next to the windows, complains about the draught and shuts them again.” – Huang, accountant in open plan office

“Of course I close windows overnight! No one told me they needed to stay open to cool the place down.” – Bernard, cleaner

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