

What Occupants Want

Chapter 7 of DLE/IOD Guide "Getting Better Value from Your Buildings"

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- Occupants care more about health, safety and comfort than image and design glitz
- People are more tolerant of conditions if they have more control over them
- Responsive management can help compensate for poorer conditions

What kinds of buildings make occupants happy?

Building use studies [1] are unequivocal. Whether they work in laboratories, educational institutions, healthcare buildings or offices, people want the same things. Top of the list are:

- An environment that meets “good enough” expectations for comfort, health and safety.
- The ability to put things right quickly if they go wrong, preferably without the intervention of anyone else. This applies especially to the heating, cooling, ventilation and lighting conditions (in that order of priority).
- The ability to adjust settings to suit requirements (some modern workstations are very constrained);
- A “personal” space;
- The freedom to work without the stress of repeated interruptions.

Occupants, then, are most concerned with the boring basics: things such as image, aesthetics and design quality are not as immediately important to them.

“Virtuous” features

Greater occupant satisfaction usually means improved productivity: the better people feel, the healthier they are and the healthier they are, the more they will produce. Achieving this virtuous circle should, therefore, be one of the central aims of commercial property development.

Greater satisfaction is more likely when most or all of the following are present in a building:

- shallower plan forms (less than 15m across from window wall to window wall is the yardstick – the upper limit of natural ventilation);
- lower occupant densities (especially in offices where people spend long hours at their desks);
- single-person (or small groups) with rooms of their own;
- thermal mass creating stable, comfortable and predictable thermal conditions in winter and, especially, summer;
- controlled background ventilation without unwanted air infiltration;
- openable windows;
- views out;
- quiet places for staff to go at break times away from the building;

- usable controls (for heating, blinds, ventilation etc.);
- usable interfaces (facilities managers should be able to adjust the air conditioning and lighting systems easily);
- a non-sedentary workforce (with relatively low VDU usage);
- predictable occupancy patterns;
- well-informed, responsible and diligent management.

“Vicious” features

The reverse side is where the building either has inbuilt faults that are hard or impossible to eradicate (such as excessive air infiltration through bad construction) or is fundamentally unmanageable (because it is too complex for occupiers to cope with). In these cases, there will be some or all of the following features:

- deeper plan forms (with more complex ventilation, lighting, heating and cooling services, and thus higher energy consumption pro rata);
- open-plan work areas with increased likelihood of interruptions;
- larger workgroups;
- illogical primary circulation routes, especially those cutting through the middle of workgroups;
- fixed furniture and insensitive space planning that takes no notice of how the heating, ventilation and lighting services are supposed to work;
- greater mixes of activities, which are more likely to create conflicts;
- longer working hours;
- people tied to one place;
- longer times spent at computer screens;
- complex, unfathomable technology;
- irrelevant or intrusive noise;
- ineffective, indifferent or arrogant facilities management;
- nowhere for staff to escape.

Management is key

The “vicious” features are risk factors – they are not necessarily actual causes of dissatisfaction. Some very good buildings have some “bad” features. Conversely, there are many examples of badly performing buildings that have many of the supposed virtuous features.

What often makes the difference between a “good” and “bad” building is management attitude and organisational culture and resources. Where management acts rapidly on staff complaints, and staff appreciate the efforts made - whether or not they are actually successful - then occupants will be happier.

Many of the “virtuous” features are found in naturally ventilated buildings and many of the “vicious” associated with air conditioned properties. But it is not the ventilation system that matters so much as whether occupants perceive that they can change things for the better if conditions are not to their liking. This can happen in air-conditioned buildings but is less likely.

Control is what counts

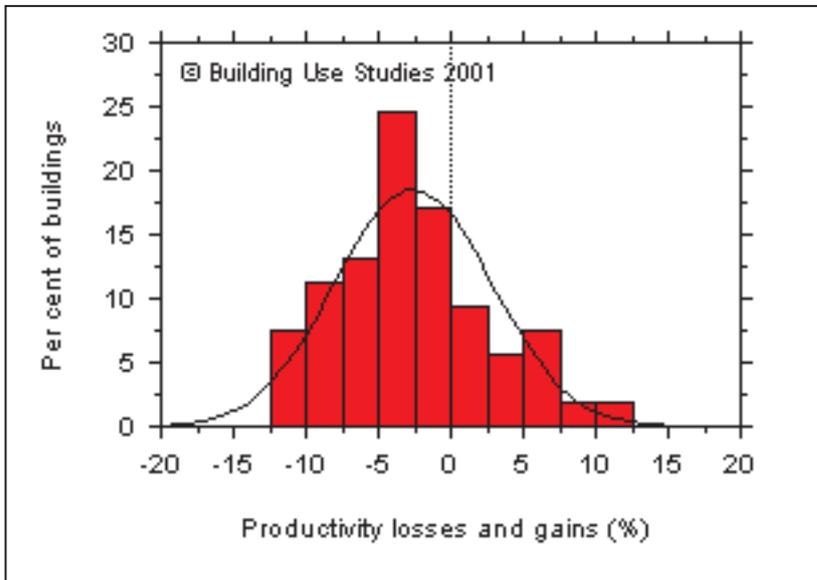
It is widely known through extensive research on thermal comfort behaviour that building users are more likely to tolerate poorer conditions if they are given some degree of control over lighting, ventilation, glare and so on. Take control away (as happens in most air-conditioned buildings – sometimes to unnecessarily excessive degrees) and occupants are much less likely to react well when things go wrong.

The air-conditioning myth

From the user’s perspective, larger, more complex air-conditioned buildings are riskier. All too often, air conditioning systems not only give sub-optimal performance (too hot, too cold, too draughty, too noisy) but also react too slowly to changing needs.

This is exactly the opposite of the property market’s perspective. The institutional market perceives risk in terms of

Figure 1 Perceived productivity in 50 UK buildings



This is an example of building occupant benchmarking taken from the Building Use Studies dataset.

It shows the distribution of perceived productivity for 50 UK buildings. The benchmark (i.e. the average) is minus 2.6%. The range is plus 12.5% (best) to minus 17.5% (worst).

For example, looking at the left-most bar on the chart, 7.5% of buildings in the dataset (from the vertical axis) have average productivity scores of minus 10% or worse (bottom axis).

threats to profitability and tends to opt for its own self-fulfilling “developer spec” without thinking through the alternatives.

Research on building users’ preferences [2] shows that occupants normally prefer natural ventilation as the default – i.e. normal – state but like supplementary cooling in the hot and humid periods of summer. In an experiment carried out by David Rowe at the University of Sydney [3], occupants who were given all possible options used air conditioning with all windows closed for only 12 days in the study year.

The “mixed” blessing

This implies that “mixed-mode” approaches (mixtures of natural ventilation and mechanical cooling, configured to suit local needs) may be more appropriate. Although they may require more thought and attention to detail at design stage (but not necessarily more cost) the “win-win” potential of mixed-mode – happier, healthier and more productive occupants and lower energy consumption, plus the potential for “reversible” flexibility and adaptability – may be more sensible in the long term [4]. However, designers are not yet skilled at coming up with appropriate solutions, performance is variable and the property market is hostile.

What difference do buildings make?

It is known that the constraints imposed by buildings have negative effects on human performance (and, of course, there can be certain acute outcomes such as fire and structural collapse). However, the measurement of productivity in buildings is not an exact science. This is because of:

- the variety of tasks undertaken by occupants;
- the costs of getting the data;
- the effects on occupant behaviour of collecting the data (behaviour may change if people know they are being studied);
- interpreting the meaning of the resulting data mountain.

To get round this, we simply ask building occupants to rate on a percentage scale the extent to which they think their work is helped or hindered by the “building environment”. Using this question (which is asked along with 40 others on aspects of building performance in feedback studies) we find that the best case is a productivity gain of 12.5 per cent and the worst case a loss of 17.5 per cent.

Figure 1 shows data for the last 50 buildings that we have surveyed using this technique in the UK. The UK mean is minus 2.6 per cent. Only about 30 per cent of all

buildings are above zero and only 10 per cent of buildings show serious productivity improvements.

It gets worse. If we split the data into those who say they are comfortable and uncomfortable, and look at the differences building by building, the productivity losses of uncomfortable staff are 8.8 per cent and the gains on average of comfortable staff 4.0 per cent (a difference of 12.8 points). The poorer buildings show wider discrepancies (in the worst case minus 25 per cent and plus 10 per cent – a difference of 35 per cent between comfortable and uncomfortable staff).

Conclusion

The obvious conclusion is to target discomfort, rather than just trying to provide comfort in the first place. There is a subtle difference between the two: alleviating discomfort relies on empowerment of users; providing “comfort” is the approach of design rationalists. As with many things in real life, rationalism has a nasty habit of losing out eventually. Giving occupants and users the means to eradicate building-related discomfort (especially with openable windows) is more sensible in many instances than trying to optimise the conditions with fully automated controls. As one of the users put it in one of our feedback studies: “The building management system may know about the temperature, but it does not sit in the draught it causes.”

There is a simpler answer: get the basics right. For occupants this means:

- predictable, stable conditions that are usually comfortable but that can be altered quickly if they are not to people’s liking;
- buildings that can be run properly by the occupying organisation, with no unmanageable complexity;
- occupant densities that give people some degree of freedom to change things;
- feedback on performance, so that things that are going wrong can be quickly corrected.

References

- [1] Findings come from studies of buildings carried out by Building Use Studies. For further information visit www.usablebuildings.co.uk. The March-April 2001 issue of the research journal
- [2] BAKER N., The Irritable Occupant: recent developments in thermal comfort theory, *Architectural Research Quarterly*, Vol 2, Winter, 1996, Winter
- [3] ROWE D., DINH C. and JULIAN W., Mixed Mode Thermal Control: High score for comfort, low energy consumption, Department of Architecture, University of Sydney, August 1997
- [4] BORDASS, Bill and JAUNZENS, Denise, Mixed Mode: the ultimate option?, *Building Services*, The CIBSE Journal, 1996, November, pps. 27-29