*Buildings that are designed and managed with the needs of occupants in mind will house a happier, more productive workforce. By **Adrian Leaman**.*

Outside the comfort zone:
buildings and basic human needs

N TERMS of building design and functioning, just a few things make all the difference to human performance in the workplace.

We know this from hundreds of studies carried out since 1985 in the UK and internationally, using the Building Use Studies occupant survey questionnaire. The human factors that matter most, in approximate order of importance, are: thermal comfort, ability to take action quickly when things don't work, perceived control, no unwanted noise and enough space. Most are nearly obvious but that doesn't mean that they are routinely provided. Any building which offers most of them, however, will almost certainly have occupants who report relatively higher perceived productivity, and who are probably healthier and happier as well. It matters little to occupants what the building they work in looks like: that comes way down their list of priorities.

Thermal comfort

Feeling not too hot and not too cold is the most vital aspect. This is not earth shattering. We all know that comfort has an impact on our health and productivity. Our studies consistently show that thermal comfort is top of the tree, as far as factors which affect human performance are concerned. In particular, we have found that the buildings that are rated best to work in are as comfortable in summer as they are in winter (otherwise, in hot and humid conditions, working can be almost unbearable) and have a mixture of natural ventilation and air conditioning. People are more comfortable if they feel that they have control (see below) over their thermal comfort, and it helps a lot if heating or ventilation controls actually do what they are supposed to do, and people know where to find them.

Rapid response

When things go wrong, it is helpful if occupants are quickly able to put things right, either by doing something for themselves (like opening a window) or by calling a help line that generates meaningful, useful and speedy action – most help lines don't. We find that such buildings are perceived as much better to work in. Speed of response may come from usable design or from proactive and diligent management. It does not really matter what the source of the response is, as long as it exists and

functions. In many modern buildings, responses are much slower than they ought to be; this is despite the buildings being stuffed full of technology which, in theory, is supposed to fulfil needs. Often, poorly managed technology is the problem, not the answer.

Perceived control

This third factor is connected to the first two. People are more tolerant of chronic faults with buildings (we call this 'forgiveness') if they have more options for dealing with their own surroundings – for instance better control over blinds, lights, windows and positioning of furniture or, lacking this, at least the ability to trade off the lesser of two evils (for example, choosing whether they would rather be too hot or suffer from too much noise in summer).

Many modern buildings have fewer opportunities for personal control either deliberately, because designers have removed individual controls and replaced them with automatic systems, or because the installed technology is not working as intended. In extreme cases, it may be switched off altogether. We have, in our studies, clearly shown the relationship between human effectiveness and personal control, and there is much greater interest in this now than ten years ago. Designers, therefore, tend to take usability and control rather more seriously than they once did.

No unwanted noise

Relevant noise is good; irrelevant noise is a bane. In many buildings, it is impossible for occupants to block out distractions. Many sources of noise nuisance should never have arisen in the first place and only exist because of inept space planning (for instance too many people sitting next to walkways in open-plan offices), poor integration of telecoms with the space plan (sockets for computers and telephones not being near desks) and cheap and ill-maintained components (for instance squeaky door closers which also bang doors unnecessarily). Also, work group layouts which do not take into account group dynamics are a problem (for instance people in work groups who are not within line of sight and earshot of each other, and who can't control lighting and heating in their own sections).

Enough space

People want enough space to do what they have to do. The recent trend towards packing people into

buildings has the obvious revenge effect of threatening to make environmental conditions worse unless the services are adjusted to cope. The worst buildings we have found all had far more people working in them than the available space could comfortably accommodate. In the main, such buildings are too hot, noisy and dirty.

When it comes to people and space, low densities are embarrassing; high densities are unbearable. (The same problems beset theatres, trains and aircraft: things usually start to get uncomfortable when more than 70 per cent of the seats are occupied.) Thresholds of good performance are achieved somewhere in between. Offices are generally run at 40–70 per cent capacity, although corporate management tends to want 100 per cent.

Outside awareness

Although the above five factors are the ones that concern people most, there are many others that have an impact on people's satisfaction with the building they work in. Data from Building Use Studies consistently show that occupants prefer buildings that are less than 15 metres across, partly because they can all be closer to windows, with better views out. In Britain, where the climate may force people to stay indoors, people often say they feel trapped, with nowhere to go to relieve the indoor conditions (and perhaps also the tedium of their work). Somewhere to escape is quite important – which explains why buildings on our Australian dataset show up as much healthier than those in the UK.

An outdoor lifestyle, with fewer constraints on staying indoors, has obvious benefits. But if you cannot get out, at least views out are a reasonable compensation. Just as with thermal comfort and personal control, compensating occupants for things that have been taken away is appreciated, even if the substitute is not as good as the real thing.

Regular monitoring of performance

Performance monitoring is not counted as a basic requirement in the above list, but, in our view, it should be. In many of the best buildings on our rating systems, there is some sort of monitoring of how well things are working. Performance monitoring is a form of quality control, and is usually a good indicator of an organisational culture that rewards performance improvement. It is also another way of ensuring that basic needs are met – a good reason for making monitoring the norm in buildings.

Thorough cleaning

In our work in the late 1980s on sick buildings, one research finding shone through. Cleaning buildings properly has a positive effect on health! This has been known about at least since Victorian times, but so few organisations rate it highly enough. Regular wet cleaning is best, twice yearly.

Occupants really appreciate it, and it is a good way of keeping things tidy, dust free and paper free as well.

Energy efficiency

When we plot energy efficiency against human performance, we find that they are linked. Obviously, one does not cause the other. However, they are both likely to be present in a well-managed system that is also being monitored properly. There is clear evidence of leveraging. Saving energy is the result of better management, which also results in better human performance. In other words, if managers are aware of people's needs and how to run a building efficiently, they are likely to have a happier workforce.

Manageable complexity

We find many modern buildings where complexity outruns manageability. The best buildings tend to be either those that have sufficient management resources devoted to facilities management to enable things to be run properly, or buildings that are simple enough not to require a significant building management input. The danger areas are complex buildings that are under-resourced. In buildings, technology is not a substitute for management; it is a reason for it.
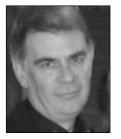
Ability to meet basic needs

Building occupants are wary of grand design statements and architecture with a capital 'A', especially if the designers are famous. They have good reason. We find that the best buildings from a user's point of view are usually modest, self-effacing even. Occupants do not want to work in design statements. They just want their basic needs met in an unpretentious way.

Design briefs with targets clearly set

Incredibly, many buildings do not have a formal design brief. Clients assume they will get what they don't ask for – such as energy efficiency, windows that can be seen out of, ventilation systems that work as well in summer as winter, and so on. This means that both client and design team can be muddled about what they are trying to achieve and what the building is actually for. Designers need to be given a specific brief, in which targets are spelt out. If targets are not set, outcomes will not be able to be measured later. Is it, then, any wonder that designers rarely go back into buildings when they are occupied and study how they really work?

Gentle engineering

The less technology intrudes into people's lives, the better they like it. Moral? In buildings where people work, make the technology as invisible as possible. Where it is intrusive, make it usable. Do not pretend that technology is in the background when it probably is not. For occupants, usability trumps designer fantasies every time! ■

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