It is always useful to know whether the investment in a new building will improve the productivity of the workforce. The trouble is that workplace productivity is much harder to measure than labour productivity, and the two are often confused.

The truth is that only a few tasks in the workplace are capable of precise measurement. Where these are constantly monitored – as in some call centres which have Orwellian screens with data on queuing and response times – one suspects that the monitoring creates more of a problem than a solution. If you have data on call centre telephonists, for example, you won’t have information about their managers’ productivity.

You are then caught between the devil and the deep blue sea – you have specific data on a few staff, but it’s not representative of the workforce as a whole. Also, because staff know they are being monitored, their responses are suspect – they may be playing the system to suit their own ends. If you monitor staff without them knowing, they may get upset when they find out.

These are just some of the reasons why it is better to use subjective assessments of productivity. Subjective can be a dirty word outside the social sciences – it implies bias. However, with proper sampling, subjective data gives all the information that is needed. It’s also usually far cheaper and is less threatening to management or staff.

Over the years, Building Use Studies (BUS) has collected information about perceived productivity using a single question on the BUS Occupant questionnaire. Figure 1 shows some of the results for the UK, using the data gathered in 1999. For this sample (benchmarked against a rolling dataset of 50 buildings) the average perceived productivity is minus 2.6%.

With this knowledge, it is possible to give a rough answer to the question: “how important are buildings to workplace productivity?”

The answer is that, in the UK, the best buildings have a perceived productivity lift of up to plus 12.5%, and the worst a productivity fall of up to minus 17.5%. In other words, a difference between the best and the worst buildings of 30%. Just under 30% of buildings report any productivity gain – that is, their scores are greater than zero.

What do these numbers mean?

These numbers simply tell us whether staff think that things are made better or worse by the indoor conditions, design and layout. Arguably there is no need to go beyond this straightforward level because you quickly get lost in a methodological miasma of cause and effect, normalisation and other statistical black holes.

Real buildings are much less tidy than laboratory experiments or computer models. Statistical models were designed for controlled experimentation, and in reality buildings are usually too rich in variables to be reduced to formulaic expressions.

For example, data on health, comfort, satisfaction and productivity are usually strongly correlated. When one goes up, all the others go up. It’s tempting to try to look at cause and effect, but the more you do this, the more likely
that you need more and more information about more and more variables.

With buildings, the variables tend to be connected like a cat’s cradle. Usually you cannot influence most of the important variables in a given situation. Often you find that actions and reactions are non-linear.

With workplace productivity, two things are invariably important. First, the need for conditions to be perceived by the occupants as both comfortable for most of the time, and capable of change for the better where necessary. Second, to have a working environment where occupant needs are perceived to be met rapidly.

It is vital to provide the ability to alleviate discomfort when it arises. Providing comfort is one thing, alleviating discomfort quite another. Many engineers mistakenly concentrate on comfort provision without bothering about discomfort alleviation. It’s a subtle difference conceptually, but a real difference if you are an occupant on the receiving end.

Figures 2 demonstrates the point, showing a strong association between perceived comfort and productivity. It tends to be particularly high for soft (non-engineering) variables.

In the BUS data on prevalence of discomfort in UK buildings, the best buildings still have 65% of staff saying that they are uncomfortable with at least one variable, out of heating, cooling, ventilation, lighting and noise.

Human perception of speed of response is difficult to pin down. The results indicate that the more people think that their needs are met quickly, the happier they are.

**Which buildings work best?**

Stable, controllable comfort conditions and quick response to needs can be met by most buildings, irrespective of construction type or system of ventilation. Some, though, are intrinsically better than others.

Naturally ventilated buildings tend to give better workplace productivity results than air conditioned buildings, but this does not mean that air conditioned buildings are incapable of good productivity scores. Similarly, cellular (or at least small, well integrated workgroups) are better than open-plan, but open-plan can still be good in some circumstances.

If these are the themes that underlie workplace productivity what are the main variations? Three candidates stand out: work setting, work type, and whether they are private or public sector buildings.

Office work settings can be usefully classified into interactive and occupancy (figure 3). This gives four basic work settings for tasks, logistics, projects and meetings.

In tasks, people usually work by themselves, and often for uninterrupted periods. A person’s tolerance of interruptions will differ, depending on the task. Software developers, for example, may have very low tolerance thresholds when concentrating on a complex algorithm. These people may only occasionally need to meet, and may work at computer screens for long hours.
Control is important
Much of the above has been known about for a long time. We all experience it ourselves, so there is no great surprise that research shows it as well. This takes us straight back to the basics: sedentary and lower grade staff need excellent comfort conditions and plenty – but not too much – control.

Take lighting. The best productivity results in work settings which are basically uplit, with good individual control over lighting for the particular task. This way differences in visual acuity can be catered for, as well as all the subtle contextual variations in daylight and glare conditions around the office at different times. This helps also to avoid the lights on/blinds down scenario, a sure sign that the conditions are bot-

Why noise matters
Putting people who need few interruptions into spaces which are very noisy is guaranteed to lower productivity. For example, designers often assume that the openness of open-plan often leads to better communication. It may for some staff who actually need to communicate with each other on a continuous basis, but for many, like finance, legal and tax departments, this can be a serious distraction.

Many managers report better productivity, but these are the people who have their own offices, plenty of meeting space and more control over their own time. Others are not so fortunate. Academics, for example, are often now put into high density open-plan layouts. The reasoning is that they are not at their desks most of the time anyway, so why waste space on them when utilisation levels are so low?

But academics tend to have needs which are not usually met in the open-plan. These include books and manuals (sometimes in prodigious quantities), the need to host tutorials or personal meetings with students, and periods when they need to concentrate on getting something written in private.

If these needs are not met, academics will work in a library or simply go home. Hence the Marie Celeste atmosphere of many university departments.

So what does this mean to designers? At a basic level, it is important to put the users needs first, and not as an afterthought. For those whose work tasks can be adversely affected by random interruptions, cellular offices or small, well-integrated workgroups are the answer. Never assume that people need to communicate with each other all the time.

Like work settings, typecasting work func-
tions is complicated, but there is one useful rule of thumb. The more control you have over your time and your environment, the happier and more productive you are likely to be. This does not just apply to managers and other senior staff, who fall clearly into this category, but also to part-time staff – or at least people who do not have to come into their building five days a week.

This reverse is also true: the more you sit at a desk, the more you use a computer, the less likely you are to say you are productive. Therefore, it is important that people who need few interruptions into spaces which are very noisy are guaranteed to lower productivity.

"Putting people who need few interruptions into spaces which are very noisy is guaranteed to lower productivity"