

# CALLING THE TUNE

Workplace researchers have an annoying habit of creating abstract phrases, like design quality and the productive workplace, and then expect clients and building designers to understand what they mean. So what do they all mean?

BY ADRIAN LEAMAN

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. And 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



Shepherd Engineering Services has recently completed this £1.4 million m&e contract for call centre client Orange. The new 7000 m<sup>2</sup> customer services centre in Tyneside is designed to accommodate up to 1000 employees.

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<sup>1</sup>.

"Survey results are good enough to indicate that the more people think that their needs are met quickly, the happier they are"

## 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

# main feature

## the productive workplace

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.

Figure 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?

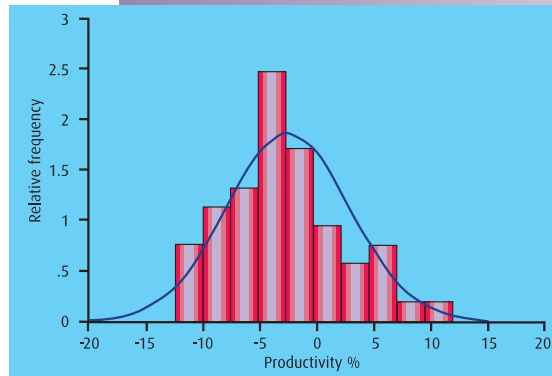
Stable, controllable comfort conditions and quick response to needs can be met by most buildings, irrespective of construction type or system of ventilation. Some, though, are intrinsically better than others.

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.

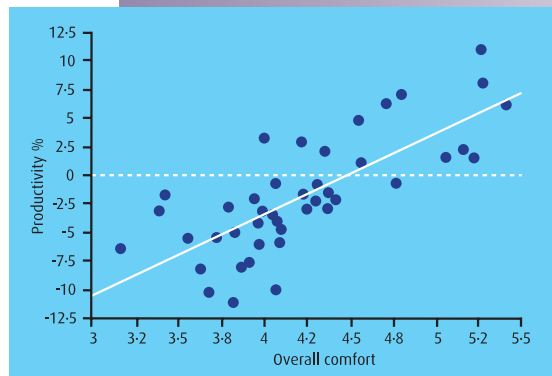
If these are the themes that underlie workplace productivity what are the main variations? Three candidates stand out: work setting, work type, and whether they are private or public sector buildings.

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<sup>2</sup>.

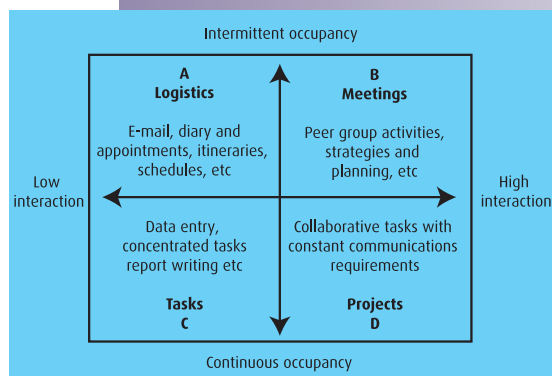
In tasks, people usually work by themselves, and often for uninterrupted periods. A person's tolerance of interruptions will differ, depending on the task. Software developers, for example, may have very low tolerance thresholds when concentrating on a complex algorithm. These people may only occasionally need to meet, and may work at computer screens for long hours.



**FIGURE 1: Perceived workplace productivity.** This is based on the last 50 UK buildings surveyed by Building Use Studies. Respondents are asked to rate on a percentage scale how much they think their productivity at work is affected by their environment. The histogram shows the distribution of the averages for the 50 buildings. The vertical scale shows relative frequencies: that is, the proportions of the total that fall into a particular category (eg 0.25 (25%) fall between 0 and -2.5)



**FIGURE 2: Comfort and perceived productivity.** This scatter plot has the average scores for occupants' rating for perceived productivity and overall comfort. This uses a seven point scale from 1 (uncomfortable), to 7 (comfortable). Productivity and comfort are closely associated. (© Building Use Studies).



**FIGURE 3: Work settings.** Office work can be simply classified with two dimensions – occupancy and interaction among staff.

For logistical tasks, such as sales, the requirements are less onerous. People may only be in the office for short, often unpredictable periods.

For project tasks, as in a design office or in publishing, people may need to be with colleagues for most of the time, thus the open-plan workplace may be appropriate for most of them, most of the time. A meeting environment is more suited to executives.

Of course, anyone in the course of their work may need to operate in some or each of these settings, not just one of them. But the important thing to understand is that they are different from the designer's perspective, especially with respect to the big productivity killer – noise.

### 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, typcasting work functions 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.

The 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.

### 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 split, 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-

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

toming out to the lowest common denominator.

Despite strenuous efforts by the public sector in recent years, there are still substantial differences between benchmark averages for the private sector and public sectors. The data shows the median for the private sector sample is higher and the spread narrower, indicating that standards are both better and more consistent.

While the dataset is not particularly large, and the reasons for the discrepancies have not been investigated in detail, many public sector buildings require management resources beyond the levels many building users can afford (or are prepared to commit). This is not to say that the buildings they occupy are particularly different from the private sector, just that maintenance and facilities management budgets may be much lower.

### The problem of unmanageable complexity

All of which comes back to another basic theme. Workplace productivity is strongly influenced by the chronic conditions introduced to buildings by unmanageable complexity.

Organisations with well-endowed facilities budgets are usually able to manage their buildings reasonably well. In fact, the main reason

why organisations are successful is that they are good at managing and delivering certain types of complexity.

However, as soon as budgets and skills fall below a certain threshold, chronic problems set in. There is an element of Catch-22 in this. Once poor conditions become the norm, they are extremely hard to eradicate.

This applies to cleaning, decoration, and planned maintenance, and to many of the tiny details that aggravate occupants so much. These include low frequency noise from the fans, banging doors, glare from around the edges of blinds which don't fit the window properly (and have probably been fitted as an afterthought). There are countless examples like this, all of them never reaching high enough up the priority list to be fixed. So many buildings only get fixed when threats of a health and safety inspection become reality.

Work settings, work type and sector only scratch the surface of what affects workplace productivity. Others are work stress, lifestyle factors like journey-to-work, locational factors like city centres/business parks, and a singular predisposition to complain. Add to that circumstantial factors like morale of the workforce and quality of local managers, and you have factors which are extremely difficult to sort. Many factors are connected or mutual in some way.

Given all this, the best advice is to steer clear of those issues which cannot be directly influenced by the physical design of the building, or the intervention of facilities managers. It's best to stick to those things which are 'one step away from a design decision'.

Sadly, only about 10% of British buildings – perhaps 20% if we are generous – actually meet success criteria in the eyes of the occupants. Why? Because designers and clients alike are too myopic with technology. They unwittingly think that technology will solve problems without creating any new ones.

Technology begets complexity. The best buildings are procured by people who understand this. They either resource their facilities and maintenance budgets properly and protect the budgets so that the inevitable technological downsides can be managed, or they have very simple buildings which do not impose these problems too much on their occupiers in the first place.

Unmanageable complexity is the bane of workplace productivity. The answer lies in putting needs first, and constantly revisiting them to make sure they are properly met.

Adrian Leaman runs Building Use Studies, which carries out post-occupancy surveys of buildings and manages feedback for briefing. Further details may be found on [www.usablebuildings.co.uk](http://www.usablebuildings.co.uk)

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