



Property in the Economy

**Workplace design and productivity:
are they inextricably linked?**

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Brian Thompson, Drivers Jonas

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Property in the Economy

Preface

This report was commissioned by RICS as part of its ongoing commitment to providing members and other property professionals with impartial, transparent and authoritative information and data in the field of corporate real estate, both in the private and public sectors.

This report forms part of a suite of corporate real estate research and information with the data and statistics report *Property in the Economy: A digest and review of key data and statistics* (RICS, 2008) forming the backbone.

Future reports include, agile working, ICT in the workplace and sustainability.

This report has been produced for RICS by Brian Thompson of Drivers Jonas, with support from Sarah Kay at Woods Bagot.

Selected references can be found at the end of the report, but it must be noted that not all references within the report have been cited.

The findings do not necessarily represent the views of RICS. For further information about this report contact Rosemary Elder, relder@rics.org, 0207 695 1597 or visit www.rics.org.

Chartered surveyors advise on all aspects of the UK property industry and its business premises. For details of firms call RICS on +44 (0)870 333 1600, or visit www.ricsfirms.com

Chapter 1: Introduction



The concept of productivity in the workplace is attracting great interest and quite rightly so. No longer is it solely in the domain of the academics, HR function or the architects and workplace strategists – we now find experts in real estate, facilities management, furniture supply, air conditioning systems and many more taking an active interest in what has become a major issue for business.

It is predicted that the concept is here to stay, certainly so in the minds of business managers. Consequently, those with a stake in the property sector must rise to the challenge and develop methodologies that inform the business manager and perhaps also provide support to business cases involving an investment in real estate.

This report aims to further raise the profile of productivity in the workplace with a particular focus on the office setting.

There is a seemingly endless drive for improved efficiency in the workplace, and a tendency for the performance of property and those managing property to be measured on efficiency grounds alone. It is not surprising, therefore, that effectiveness of the workplace receives relatively few column inches of coverage and may even be compromised in a blind drive for efficiency. The fact that effectiveness and productivity are ill-defined concepts in the context of the workplace does not help matters.

Evidence indicates that, while the physical attributes of the workplace such as air quality and lighting can have an impact on the productivity of occupiers, it has been known for some time that what might be termed the psychosocial aspects of the working environment can also be significant contributors (or inhibitors) towards greater productivity. These aspects may relate to the ability to interact with colleagues, the degree of social equity and community in the workplace and the provision of a stimulating visual environment.

The effective design of the workplace is a fundamental, non-negotiable aspect of good business practice. But, attention to workplace design alone means missing some vital ingredients

in the recipe for productivity enhancement. Looking purely at the physical attributes of the working environment, research points towards some quite staggering productivity improvements in store if various attributes are tackled in tandem.

An attempt is made in this report to quantify the potential productivity benefits that can arise and set those against property-related costs. It is shown that a modest improvement in productivity can deliver economic benefits that overshadow the savings that can be achieved through economies in areas such as rent, FM costs and utilities. The complexity of the working environment and the stage of evolution of productivity measurement mean that, at this moment in time, it is difficult to state categorically that productivity savings are 'bankable'.

An outcome of the research includes a series of conclusions and recommendations targeted at the property industry in general or the organisation planning a change in its workplace. The conclusions and recommendations, to be found in detail in Chapter 12 are reflected in the questions in the table opposite aimed at 'testing' an organisation's state of readiness to embrace using the workplace to enhance productivity.

These conclusions will hopefully assist in aligning the two greatest assets of most organisations – its people and its real estate.

How does your organisation deal with productivity in the workplace?

Where does your organisation's workplace fit on the spectrum? The table on the next page seeks 'black and white' answers although the reality for many organisations might be a 'shade of grey'. In fact, the responses from various senior managers within the same organisation could well be inconsistent! But it is no bad thing if, as a result, productivity and the role of the workplace is properly debated within the board room.

Factor	If 'yes', you score	Your score
Do you conduct regular satisfaction surveys of your employees?	5	
Do those satisfaction surveys explore views of the workplace?	10	
Do you measure the productivity of employees (other than through use of timesheets and annual appraisals)?	5	
Do you take steps to improve productivity by involving the staff when proactively reviewing the workplace, and reviewing the results?	10	
Do you involve your workforce when deciding how work is to be carried out?	10	
Do you involve your workforce when deciding how the office environment is configured and fitted out?	10	
Is the facilities management regime, whether conducted by a landlord, third party, in-house, or some combination of suppliers, truly customer-focused?	5	
Is the performance of property or facilities management support related to occupier productivity to any extent?	10	
Do you know those aspects of your working environment that inhibit or support productivity?	10	
Do you consider the impact on workforce output when implementing efficiency plans in the office?	10	
Do you genuinely believe the design and operation of the office can positively impact on productivity?	15	

In very simplistic terms, if you...

SCORED 0-30: your processes for managing the office and its occupiers are in need of an urgent health check, but the potential benefits are very significant.

SCORED 31-50: there is evidence of a clear understanding of the benefits to your organisation by better understanding the workplace, but there isn't a consistent or thorough approach.

SCORED 51-80: your business model is towards the forefront of current thinking and your organisation is therefore likely to be receptive to further ideas to measure and enhance productivity in the workplace.

SCORED 81-100: your approach is a model for others and should be encapsulated in a case study.

Chapter 2: Productivity and workplace design

If the number of journal articles, research papers conferences and other public events is a proxy for innovation, public interest, and popularity, there is no doubt whatsoever that the inter-linked subjects of productivity and workplace design are becoming highly analysed and widely discussed subjects.

Well, perhaps only in relative terms. Even as recently as ten years ago, commentary on the subjects was confined largely to specialist industry periodicals reporting on the latest research findings. Today, it has achieved more common currency to the extent that many property market players, and internal HR departments, are talking relatively freely about creating a truly productive working environment.

Sustainability, as a subject rather than an objective, has also been through a similar evolution. A decade or two ago, it might have been seen as rather quaint to conceive of embedding long term sustainability into the design, procurement and operation of buildings. To do otherwise now is simply short-sighted and lacking in customer focus.

And there is at last a harmonising of views about what sustainability means in practice. Furthermore, building a business case around the costs and long term benefits of a sustainable building is now a more transparent exercise.

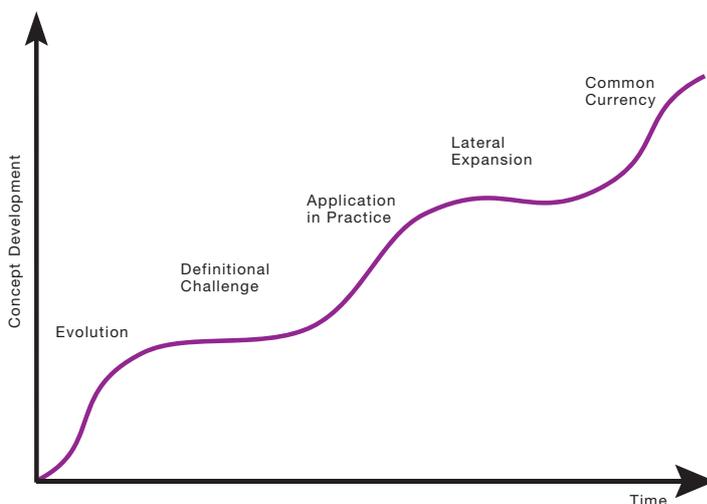
Maybe in another decade, productivity will have achieved the same accolades. For the moment, it is a concept shrouded in some mystery for several reasons. How does one measure productivity in the workplace? Even if it can be measured, how legitimate is it to attribute characteristics of the workplace to changes in productivity levels? In the final analysis, how robust is a business case that purports to deliver quantifiable benefits arising out of enhanced productivity?

The diagram opposite portrays the evolution of concepts into practice. The stages are:

- evolution – a concept is born because of economic necessity, regulatory enforcement or some other driver;
- definitional challenge – the market seeks to define the concept in clear, concise terms;
- application in practice – the market puts into practice the concept;
- lateral expansion – attempts are sought to broaden the application of the concept and/or link it to other concepts; and
- common currency – credibility has been achieved and the market has acclimatised itself to applying the concept almost as common practice.

Consider a few concepts. In simplistic terms, it might be said that the language of health and safety is now common currency, sustainability is being applied in practice and being applied outside its pure technical 'home' while productivity is lagging behind as we strive to get comfortable with the concept. True, some organisations have been measuring it and even enhancing it for some time but there are no common ground rules as yet.

Evolution of concepts



This report recognises that, for many organisations today, measuring productivity is a real challenge. It also recognises that increased productivity is a very real goal of all organisations whether their business is providing public services or enhancing shareholder value, or sits somewhere in the expansive spectrum between these extremes.

The purpose of this report is to help raise the profile of organisational and individual productivity among those whose business is providing and maintaining the built environment. More specifically, research has focused on occupiers of office accommodation. It is fair to say that the science of understanding productivity in, say, retail or licensed premises is rather more advanced than in the office environment. It is also fair to say that the dynamics are very different. The ingredients of interior design that enable a retailer or licensee to sell more of their products have very limited application to the manager seeking increased productivity from office-based employees.

The report also attempts to identify some challenges for the property market in embracing a goal of supporting business to enhance workforce productivity. To counter these challenges, some opportunities are also defined.

It is important to emphasise with equal clarity what this does not set out to achieve. Therefore, this report does not comprise:

- a comprehensive literature review of the expanding body of relevant research;
- a practical step-by-step guide to ensuring enhanced productivity through workplace design; or
- the findings of empirical research conducted by a research team.

Productivity and workplace design

Research

At this point, it is worth raising a few comments on research conducted to date.

Contrary to the views of some, there is an expansive body of research in existence although it must be admitted that some 'new' research is a revisiting of well-established research to explore linkages, contradictions and trends. This still has immense value if it helps validate previous findings and brings together disparate findings from different countries or even continents.

Some research, which has acquired high status and is often cited, is built on less than firm foundations by reason of the research methodology – small number of occupiers surveyed, single buildings surveyed or little or no account taken of extraneous factors that might have impacted on the survey results.

It might also be suggested that some research is less than totally objective. Is the research that identifies a very strong and direct link between lighting, workstation design or noise and the productivity of occupiers, sponsored by a commercial company operating in the field or an industry body that exists to promote a cadre of commercial companies? The research should not be discounted immediately if it comes up with these findings – but it is always worthwhile understanding the motives of the researcher or its sponsor.

Academic research papers commonly describe in detail the further research that needs to be undertaken to explore the hypothesis put forward, or to further validate the findings in the initial paper. Once again, this may be entirely appropriate and necessary to prevent organisations adopting courses of action that may be founded on speculation or, at best, limited field work. But it also leads one to conclude that the 'right' answer will never be uncovered because, so long as this is the case, research will continue to be required!

Allied to this, many researchers share the view that knowledge and understanding of productivity and workplace design is in its infancy. Beyond that, there are widely held views that more scientific evaluation and studies of organisational change over time are required before one can pronounce on the way forward. For example:

- "The study has outlined the effects of workplace innovation, but many gaps in necessary knowledge still exist. Many measurement problems still have to be resolved too." (van der Voordt, 2003)
- "The 'new office' and 'new ways of working' movements have suggested themselves as a solution though the true benefits have been the scope of little independent research. Much of the literature on both topics could be considered thinly veiled advocacy which ignores issues of workplace psychology and especially sociology." (Price, 2001)

- "Case studies provide a valuable insight into productivity but organisational change tends to accompany physical improvement, thus confounding the results." (CIBSE, 1999)

Despite the above critical observations and the potential limitations of some research, there still exists a significant volume of consistent, robust research findings that may provide useful pointers to the professional practitioner, employer, employee or other stakeholder.

What is particularly interesting about the body of research that exists is the commonality of findings irrespective of the starting point of the research project or the academic discipline involved.

Context

To help set the scene and provide context for the examination of approaches to measuring productivity in the workplace, the evolution of the office and management thinking is mapped out. What were the drivers in the evolutionary process? What were the defining characteristics of the office as it evolved?

Many parties are interested and involved in decisions regarding real estate and its occupation. The performance and financial rewards of some are even directly related to the performance of real estate. However, is this consistent with achieving optimum productivity from the workforce? Are all forces pulling in the same direction or against each other?

It is frequently stated that people are an organisation's greatest asset, followed by real estate. If this is so, why are we more accustomed to measuring the performance of real estate? Of course, the simple answer is that it is so much easier to do. On comparing the relative cost and, by implication, value of real estate with the cost and value of occupiers of real estate, it seems extraordinary that management science and operational processes have not developed so as to permit effective management of both asset classes simultaneously and in harmony.

So...

...despite so many apparent challenges to effective research, and the likely absence of a single 'right' answer, it must surely be a good thing to understand as far as we can the complex linkages between workplace design and productivity.

Chapter 3: The evolution of the office and management thinking



Larkin Building. Reproduced with the kind permission of www.buffaloah.com

The perfect alignment of the design of an office with the needs of the occupiers can be traced back over 100 years. The true application of science to the operation of business was, not surprisingly, entitled scientific management. A renowned proponent of this art was Frederick Winslow Taylor, famed for his time and motion studies that sought to identify the most efficient use of resources and the perfection of work processes.

Time and motion studies involved, among other things, identifying the optimum way of performing a given task, and replicating that task as far and wide as necessary within the organisation. It was implicit in his approach that the worker was a factor of production, nothing more and nothing less. The less freedom and initiative granted the better, otherwise room for error would creep in.

In 1904, the Larkin Building was opened – it was to be a prestigious headquarters building for the Larkin Company in Buffalo, New York. Designed on scientific management principles, the building was laid out internally to allow the processing of documentation most efficiently and, as it happened, productively.

To be fair to Taylor, he acknowledged that his recommendations for process engineering would not necessarily translate well into the office environment or indeed anywhere one might find intelligent employees who would not be satisfied with routine tasks.

Although the application of scientific management to the factory floor was typically accompanied by significant increases in the quantity of output, it was notable that the quality of output occasionally erred in the other direction. Poor industrial relations ensued in some factories and productivity dropped with strike action. Efficiency may have appeared in the short term but effectiveness in the long term became an unexpected victim. The lessons of scientific management are worth remembering by those who seek short term efficiency gains through property 'rationalisation' and ignore the quality of the output!

The evolution of the office and management thinking



Hawthorne Building. Reproduced with the kind permission of www.vintagetubeservices.com

The Hawthorne Experiments

The view that people could be treated as machines in the factory or office was dismissed by researchers whose early work led to the evolution of 'humanistic management'.

The infamous "Hawthorne Experiments" of the 1930s represented a breakthrough on many fronts and gave new insights into the motivation of individuals. Having started out as one of the foremost experts in the scientific management school of Henry Ford and Frederick Winslow Taylor, Elton Mayo wanted to investigate the effect of lighting conditions on workers' productivity at Western Electric's Hawthorne plant. He turned up the lights and, perhaps unsurprisingly, productivity increased. Curiously, though, when he turned the lights back down again, productivity increased once again.

Given a free choice, no doubt, employees would not choose to work in drab poorly-lit conditions, so how did productivity remain high even when the lights went down again? Mayo investigated this phenomenon further and eventually came to the conclusion that productivity remained high because the workers were aware that someone was paying them some attention. It didn't matter that the aim was simply to achieve the optimum lighting to productivity ratio so as to increase production without unnecessarily high electricity bills - the mere fact of paying attention to employees turns out to be motivating. Mayo eventually came to challenge much of the scientific management belief system.

Mayo's investigations also uncovered some other very interesting behaviours that have been corroborated by other research half a century later. For example, while productivity was noted as increasing when a rest period was provided and decreasing when a rest period was taken away, the research team noted that workers who were given freedom to select the time of their rest break demonstrated a further productivity increase. This could be interpreted as aligning productivity with control over one's environment and degrees of responsibility.

Another experiment at the Hawthorne Works involved giving a group of factory workers increased rest periods, free meals and more freedom to determine the way work was carried out. Productivity increased by a remarkable 80% and absenteeism decreased. It was suggested that a causal factor for the increase in productivity was the existence of a closely knit grouping comprising individuals who enjoyed each other's company. Cynics have attributed the productivity increases to extraneous factors such as the economic depression.

On balance, it is accepted that the work of Mayo and the experiments at the Hawthorne Works highlighted the positive impact on productivity arising out of management interest, group cohesion, controllability of one's working environment and methods of working and peer pressure.

It has been claimed that the overwhelming belief that employees should not be experimented with in terms of environmental conditions resulted in a relative dearth of research for several decades into the linkages between indoor environmental conditions and productivity.

So...

...although it became clear in the 1930s that productivity was a factor not simply of a building's environmental conditions, we see a great deal of research to this day aimed at deriving a direct link between an environmental attribute (temperature, air quality and so on) and productivity. The manner by which changing attributes are planned, implemented and managed would seem to be of at least equal significance.

The evolution of the office and management thinking

Recent Evolutionary Change

The concept of efficiency above all else was, and has largely remained, an overarching driver in office design and construction. Efficient construction techniques, efficient layout of space, efficient heating systems and presumably efficient business as a result for the occupier?

Going back half a century to the 1950s, the predominant office configuration comprised a warren of cells – long corridors with only artificial lighting giving access from a spine to arms of cellular offices on either side. Informal communication between occupants of discreet cells was constrained to chance corridor acquaintances and chats in the canteen. And with only a small handful of colleagues in each cell, social interaction was limited.

The open plan office came to prominence during the 1960s when knowledge work was clearly overtaking manual work as the dominant economic force – but the concept was resisted by many at the time and for decades thereafter. Robert Propst, the designer and inventor, saw that the growing complexity of office work, accompanied by growing numbers of office workers, was awakening interest and concern about office productivity.

How, he asked, could information workers become more adaptable in a world of change? How could they become more efficient and effective simultaneously? And how could

the workplace itself become more responsive to knowledge workers and their work? His solution was the first 'open plan' office system, introduced in 1968 by Herman Miller adopting the 'Action Office' brand.

The early open plan offices also offered the prospect of space (and therefore cash) savings in addition to support for organisational flexibility.

The 1970s and 1980s were characterised by office buildings that supported linear processes and hierarchical organisations. In 1973, the economic crisis caused a rethink among some leading to a rejection of the deep expanses of artificially lit, air-conditioned space. Sustainability started to enter the language of the office designer and occupier. Resistance was also apparent in some quarters to a full embrace of open plan.

In general, however, if something could be standardised, it would be – the work of the individual, the workstation and office finishes. At the same time, greater attention was being paid to the ergonomics of the workplace and the emerging opportunities afforded by IT. New office accommodation was typically designed to fit the norm – open plan with flexible partitioning used to delineate meeting rooms and the rare dedicated office. And it was still common to find open plan space filled with banks of identical desks and occasional interior design gestures towards team or group identity.

Open plan office - 1970s

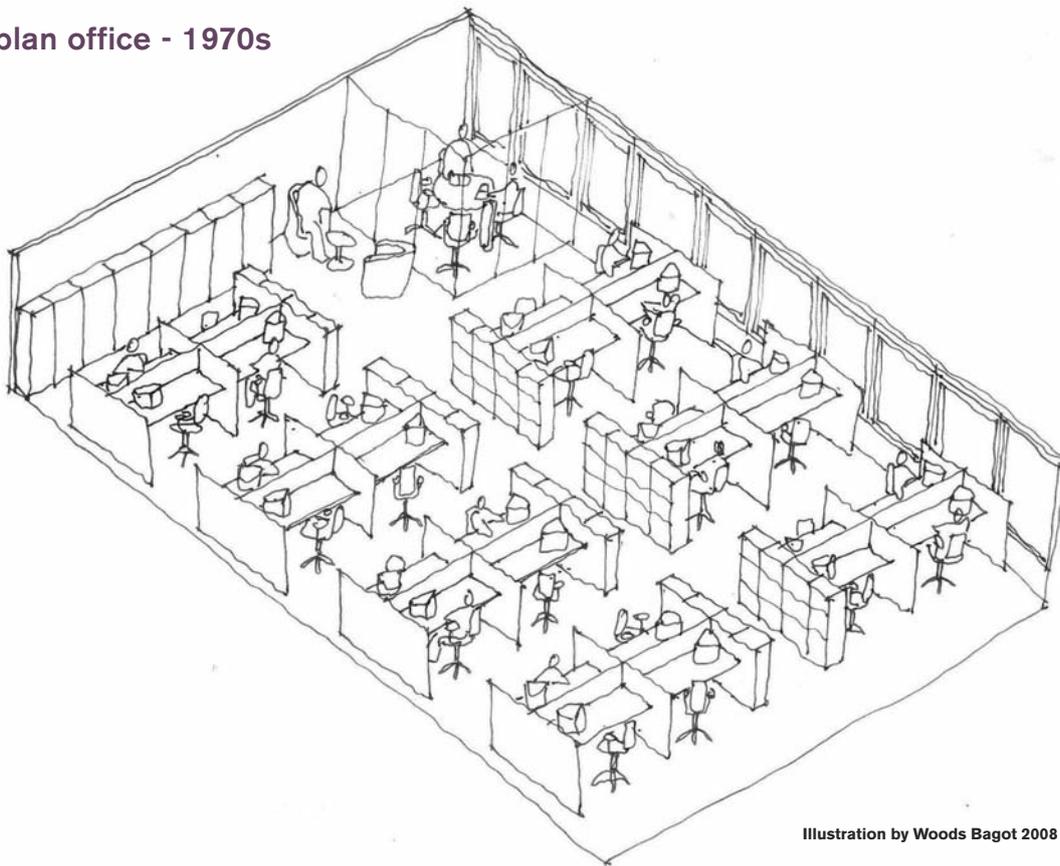


Illustration by Woods Bagot 2008

The evolution of the office and management thinking

In the 1990s, work processes remained paramount but were facilitated by faster, cheaper and more flexible technology solutions in the workplace. The IT revolution enabled organisations to change rapidly but some resolutely remained trapped in the clothes of the former decades – organisational inertia was blamed on the inflexibility of the lease or some other innocent victim. Nevertheless, many organisations did embrace other characteristics of the decade, namely, flexibility and the abandonment of hierarchy. Space standards that granted the recipient an allowance according to grade (and perhaps a coat stand and higher quality carpet) were being dropped as fast as the allocations of space to the individual were declining. Valuable knowledge workers were being offered a range of supportive amenities in and around the workplace – crèche, gym, subsidised restaurant, and private health care.

Open plan was found to be a panacea for some but not all – one consequence was the development of the 'combi office', invented by Swedish practice Tengbom. It emerged as a concept designed to obtain the advantages of both open plan and cellular layouts while mitigating their disadvantages.

In its simplest form, cellular offices are placed on the outside with communal space set in the heart of the office floor. The same concept can be applied several times over at team or group level within an office floor.

Today, process and technology remain but are augmented by an additional dimension – people. The workplace is now being designed, indeed also located and operated, with people in mind to a greater extent than ever before. There is more thought being given to facilitating interaction, supporting the culture of the organisation and providing the right space to help recruit and retain the right people.

But how much do we understand or can we understand about the needs of occupiers in reality?

Combi office

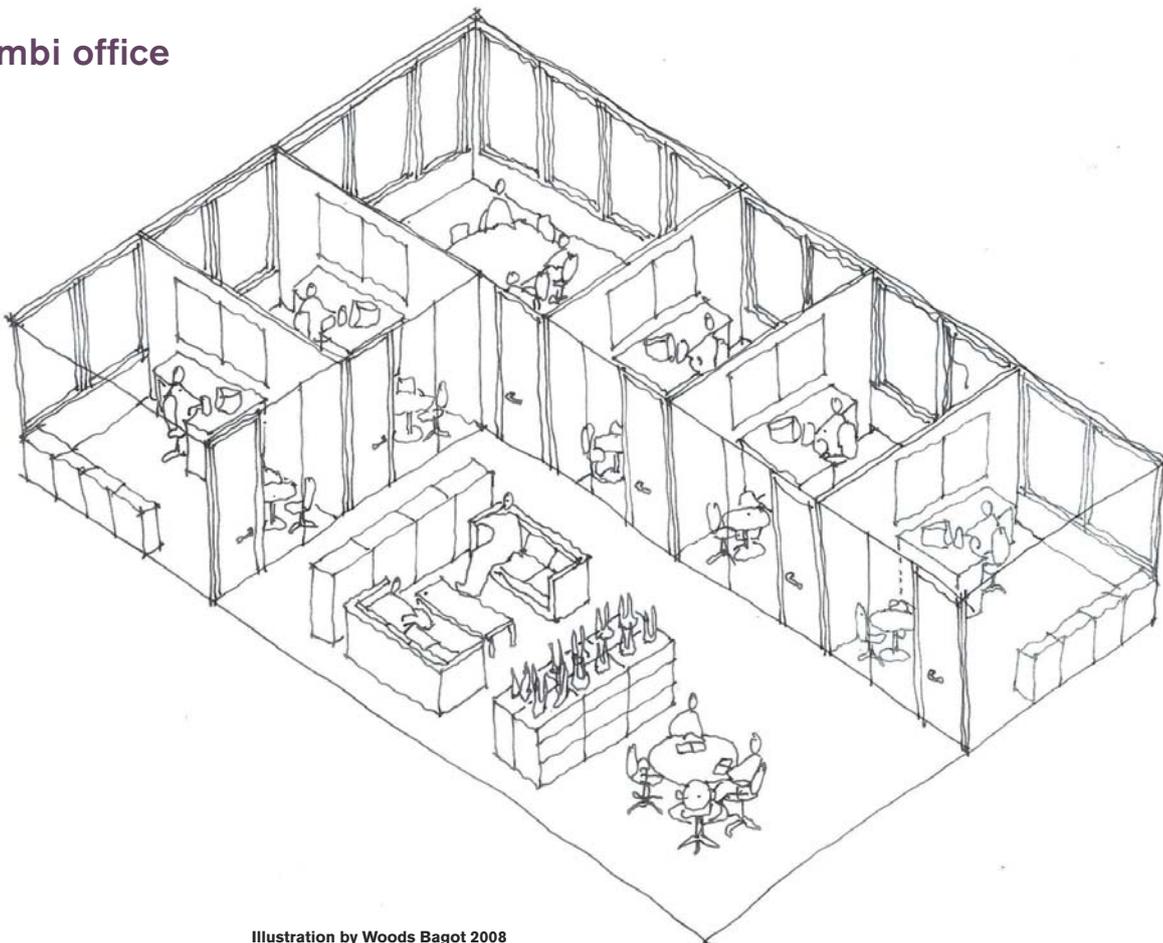


Illustration by Woods Bagot 2008

The evolution of the office and management thinking

Hierarchy of needs

Given what Mayo and others distilled from research into the human needs of the individual, it would certainly seem misguided to investigate the effect of the physical environment in isolation and without a proper understanding of the organisational environment and the characteristics of the employees jobs.

But what about the characteristics of the individual? It is timely to consider another fundamental management philosophy; that of the hierarchy of needs.

In 1954, Maslow classified human needs into five broad categories:

- physiological needs;
- safety needs;
- social needs;
- esteem needs; and
- self-actualisation needs.

The scientific management philosophers clearly focused on the physiological and safety needs of the individual. Mayo expanded their horizons to include, as a minimum, the social and esteem needs of the individual worker.

Despite this, many surveys into occupiers' satisfaction with their working environment have focused on the physiological needs through the use of questionnaires and interviews exploring satisfaction with the indoor climate, controls, the furniture layout and other primal needs.

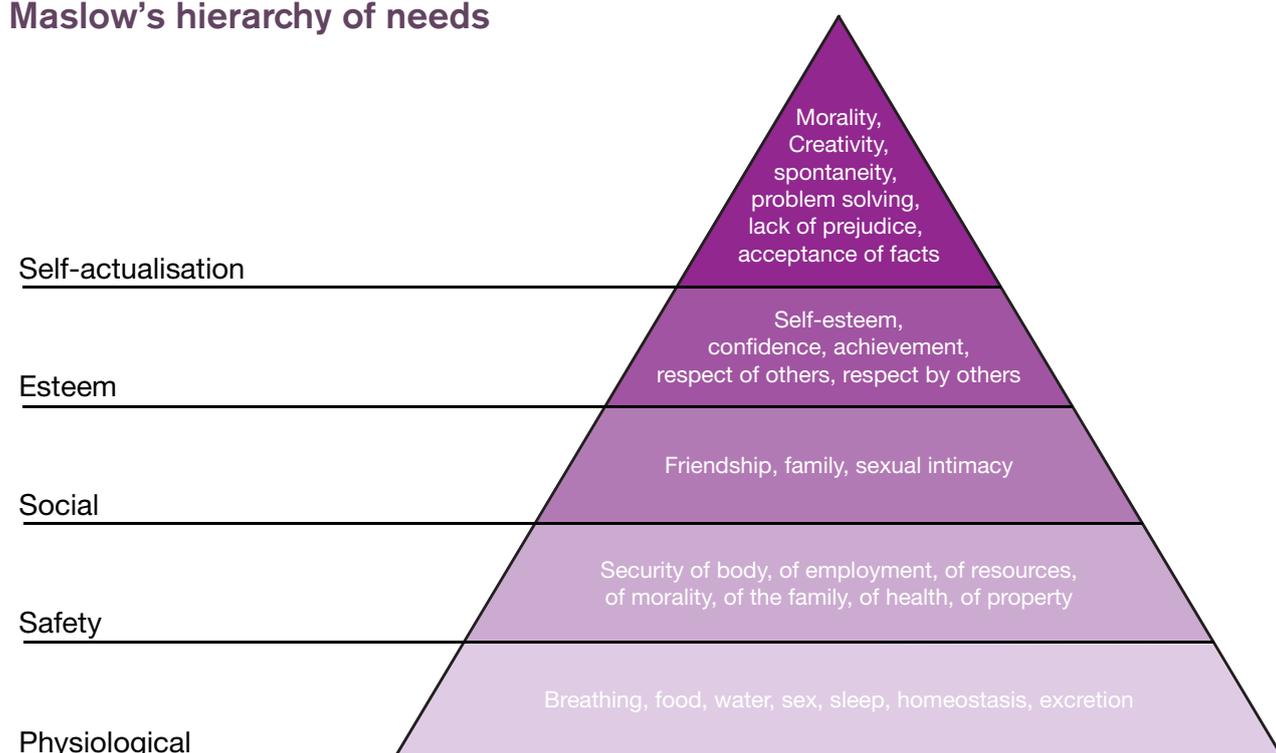
Maslow proposed that individuals seek to satisfy their primary (physiological and safety) needs before moving on to satisfy their 'higher' needs. Accommodation is a fundamental need providing shelter and comfort. As soon as a basis level of accommodation is provided, so the theory goes, individuals will look for the working environment to provide for other needs such as social contact and self-actualisation.

To the extent that those providing and maintaining the working environment consider needs, is there still excessive attention on the ability of the working environment to meet the lower level needs of the individual? The evolution of the office form into the 1990s and beyond was not consistent with this direction of attention towards the base of the hierarchy. The reality is that too few organisations get beyond the first two of three levels of the hierarchy. To do otherwise management must regard its prime asset, the workforce, as a collection of individuals with a unique set of needs and motivations.

So...

...is it necessary to understand the needs and motivations of individuals if we are to truly align an organisation's two most significant assets – people and real estate? The answer must be 'Yes, to a degree'.

Maslow's hierarchy of needs



The evolution of the office and management thinking

What is the workplace?

If we are to consider productivity and the design of the workplace, we need to have a common understanding of the workplace. To some, it is where you are at any point in time given the advent of mobile computing and telephony. This perspective isn't however terribly helpful if we want to establish the recipes for success for the office environment that is here to remain for many more decades.

As described previously, this report limits its scope of 'investigation' to the office environment – the workplace is the physical embodiment of the office despite the trend towards mobile, home and other forms of flexible working.

So far as people spend some or all of the working time in the office, it seems entirely logical to identify how the resources deployed in the workplace can be done so to maximise productivity. If one can also maximise efficiency at the same time, double bonus points are earned!

off the mark.com by Mark Parisi



Currently, the workplace is in rapid change; the number of people choosing to work outside the bounds of the office is growing exponentially (Felstead 2004). However, this doesn't mean the office is any less critical. Rather, and some have argued this quite persuasively, it is becoming even more important. Myerson and Ross (2003) argue that the office in its various forms now holds the organisation together in ways it never did before.

The 'ideal' range of spaces within the office is both large and impossible to define. Nonetheless, as a general trend, the office is becoming more focused on increasing the quantity and quality of interaction that takes place within it.

This raises an interesting point about the office and the relationship to productivity. Much of the existing work on productivity in the office focused almost exclusively on the capacity for individuals to complete tasks quickly and accurately. The focus on performance explains why much of this research focused on the human comfort factors of temperature, ventilation, light and other environmental attributes. However, if the office is a vehicle for interaction, because solitary work is performed elsewhere, there are several implications.

First, the comfort benchmarks derived to date almost always presume a relatively inactive individual, which is someone sitting at a desk for much of the day.

For people who are moving about the office, experiencing different 'micro-climates' within the office, the required human comfort conditions can change during the course of the day. Further, the work on visual and acoustic privacy, while important for concentrated solitary work, becomes less applicable if the reason people are in the office is to connect with others. In that case, overhearing or seeing someone can be beneficial.

This is not to say the earlier work is no longer applicable. Within any office there remains the need for spaces that support concentrated work. But these spaces are perhaps now less dominant. The earlier research is directly applicable to these spaces and the existing benchmarks remain important guides for this kind of space.

So...

...it seems necessary to understand the true purpose of the office, which is not a constant among organisations, before we set about designing for an organisation, and iterating that design over time.

Chapter 4: The language barrier

Within business or the public sector, we find measurements being taken of virtually anything that can be measured, even concepts such as ethos and culture and of course satisfaction.

The diagram below indicates however that the metrics of measurement and the concepts are diverse, depending on the perspective one is conditioned to taking. And that perspective is controlled as much by role and position in an organisation as any other factor.

The potential methods of measurement scheduled alongside various professional disciplines are not prioritised in any manner.

So, what constituents a productive workforce will depend to an extent on one's functional position.

For example:

- the Head of HR may regard the workforce as productive if absenteeism levels are low (in comparison to levels in a peer group). A high satisfaction rating with 'work' might also be associated with a productive organisation;
- the Head of Operations may regard low employment costs as indicative of a productive organisation;
- the Head of Finance may regard higher profitability as equivalent to a productive workforce and organisation and
- the Head of Property/Facilities may conclude that a higher density of occupation is necessarily more productive.

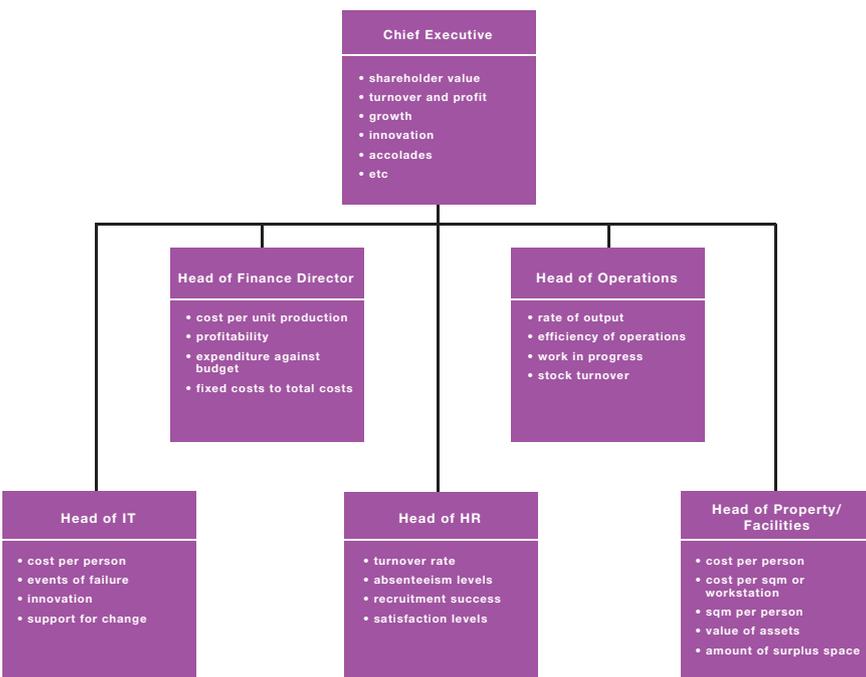
Whether or not these assertions are correct, there is no doubt that the internal drivers, motivations and performance measures within functional 'divisions' are often inconsistent.

Will keeping employment costs down and making do with 'cheap' accommodation and facilities management really lead to optimum productivity of human resources? Will the constant reallocation of budgets away from property maintenance towards unexpected but 'necessary' IT projects sustain an appropriate working environment?

A British Council for Offices (BCO) report that explored linkages between office design and business performance also noted the organisational 'divisions' in the truest sense of the word, and motivational conflicts that arise in practice. It concluded that "...contemporary corporate real estate and facilities management are often cut off from the wider and more important strategic business considerations...and they are rewarded primarily, and sometimes exclusively, for cost cutting." (1998)

It is difficult to advocate a single view of productivity across an entire organisation. However, what is defensible is the need to better understand the different dimensions of productivity so far as they affect the workforce and can be impacted on by the working environment. By implication, it is also necessary to better understand the spin-off costs and benefits that might accrue if action is taken to 'improve' productivity along one dimension – in particular, is there collateral damage?

How are people measured?



So...

...there does not appear to be a universal understanding within business about the term productivity and this deficiency is duplicated in the arena of the office, particularly where the business is far removed from a data processing factory but trades in knowledge – the policy division, the marketing team, the business development unit or the innovation squad.

Chapter 5: The economic argument



To further set the scene, it is useful to understand the importance of office accommodation and their occupiers – importance in terms of quantum, in terms of cost and in terms of the opportunities to be grasped. This section considers occupiers as an economic factor of production.

Economic value

Consider the following:

- inefficient buildings cost British business £135bn per annum and a better designed workplace could improve productivity by 19% (Gensler, 2005);
- the economic loss to the US of poor indoor environmental quality was worth approximately \$60bn in 1989 and the average productivity loss for all workers in the US due to poor internal working environments equates to approximately 3% for all white collar workers (US Environmental Protection Agency, 1989);
- the self-reported productivity loss for UK workers in a survey of office workers was, on average, 3% (Raw et al, 1999);
- US studies suggest that a 1% improvement in productivity has a larger economic return than a 100% saving in energy costs (CIBSE, 1999); and
- productivity improvement of a fraction of 1% would be sufficient to cover the cost of necessary infrastructure improvements to enhance the indoor working environment (Clements-Croome, 2003).

The office market in the UK is also large in any sense of the term. Research by the RICS, *Property in the Economy: a digest and review of key data and statistics (2008)* confirms that:

- commercial, industrial and other buildings are valued at approximately £740bn;
- at present, there is almost six times the number of employees in the service sector as in the manufacturing sector;
- the total commercial floorspace in England, Wales and Scotland in 2007 was 608bn sqm. with offices alone accounting for 100bn sqm.; and
- between 2000 and 2007, the total office floorspace increased by approximately 7 bn sqm.

The above findings suggest that management effort should be directed towards enhancing the productivity of its workforce since greater economic gains may be realisable in this arena than in some other arenas. That is not to say real estate should be ignored in relative terms.

In fact, precisely the opposite is the case. Because the working environment can have such a significantly debilitating impact on productivity, or be enormously supportive, the management of real estate and human resources should be much more closely aligned.

The economic argument

Example

The basic cost of a middle manager earning £45,000 per annum could readily inflate to a total cost in the order of £95,000 when one takes into account the following:

- Bonus, say 15%;
- Employer's NI on earnings and benefits at 12.8%;
- Pension at 15%;
- Car at £8,000;
- Training at £2,000; and
- Other benefits at, say, £2,000.

Overheads for payroll, IT, management and other support costs might be 20%.

If there are 253 potential working days per annum, this could easily reduce to 198 by reason of the following deductions:

- 25 days holiday;
- 8 days sick leave;
- 10 days training; and
- half a day per week on general administration.

The above figures don't take account of the increasing maternity, paternity and compassionate leave being granted.

On the basis of 198 actual days in the office and potentially available to contribute to the business of the organisation, it may be reasonable to reduce this by a factor of, say, 20% to allow for 'down time' between projects, travel and other time spent that is not customer facing whether in the public or private sectors.

The net number of productive days is therefore in the order of 160 and the real cost to the organisation for each productive day is £600. Simplistically, this might be regarded as the additional value to the organisation by securing an additional day's productivity from the individual. A 1.0% increase in productivity would represent 1.6 additional days with a 'value' of £960.

This figure is broadly comparable to the conclusions of William Fisk at the Lawrence Berkeley National Laboratory in the US – in 2006, he estimated that a 1% improvement in productivity of a worker with a gross cost of employment of \$100,000 has an economic benefit worth in the order of \$1,000.

Now imagine a building extending to 2,500 sqm with 200 occupiers earning average salaries of £45,000. The 'value' of each productive day is calculated as above. The table opposite is an output from a model created by Drivers Jonas

that attempts to 'measure' the value of increased productivity and set it alongside 'traditional' property and FM costs:

Factor	Office London Docklands
Occupiers	200
Average salary	£45k
Total salary bill	£9,000k
Total cost of employment	£19,000k
'Value' of productive day	£120k
'Value' of 1% increase in productivity	£192k
Rent per sqm per annum	£260
Total rent per annum	£650k
Rent – saving if reduced by 20% by relocation	£130k
Rent – saving if reduced by 10% through desk sharing	£65k
FM costs per annum	£240
Total FM costs per annum	£600k
FM – saving if costs cut by 15%	£90k

What high level conclusions can be drawn from the above?

1. the benefit to the business of achieving a 20% reduction in rent by relocating or perhaps sub-letting surplus space is dwarfed by the increased 'value' arising out of a 1% increase in productivity;
2. a 3% improvement in productivity would virtually wipe out the rental cost of the property;
3. if FM costs were to be reduced by 30%, the saving would still be less than the added 'value' from a 1% increase in productivity; and
4. property and facilities managers need to understand more fully the possible impact of their actions, either positively or negatively, on productivity, and should focus their efforts where the impact on business performance overall is greatest.

Note: in the scenario above, a reduction in floorspace brought about by desk sharing or a reduction in FM costs through a downgrading of standards might have an adverse impact on productivity thereby wiping out any immediately visible savings.

The economic argument

An alternative presentation of the relative weightings of property and people costs was portrayed in the BCO's examination of office design and business performance published in 2006. The quite dramatic figures presented in the report, reflecting the 25-year expenditure profile of an office built for owner occupation, are tabulated below:

Cost	Percentage of total
Salaries	85
Construction costs	6.5
M&E services – operation and maintenance	4
Furnishings – capital cost	1.25
Building maintenance	1
Cleaning and security	1
M&E services – depreciation	0.75
Furnishings – maintenance and depreciation	0.5

Whichever perspective one takes on property and people costs, the inevitable conclusion to be reached is clear: practitioners and business managers need to comprehend and then manipulate the interplay between the two factors of production – real estate and human resources – to help secure optimum performance from both.

So...

...if the UK can benefit by some £135bn through improved productivity in the workplace, as projected by workspace consultants Gensler, all companies and public bodies should have an action plan in place today to secure their share of the lost but latent productivity gains.

Unfortunately, the workplace is a complex system of actions and consequences and the science of productivity measurement is not yet sufficiently well developed to enable productivity savings that may arise from a proposed capital investment in real estate to be 'banked'.

And here is a challenge for industry – to develop a robust methodology that allows potential productivity benefits to be factored into business cases for capital investment projects.

Successful and productive companies

A comprehensive collection of academic research is cited and considered more fully elsewhere in this report. The exploration above of the financial dimension of productivity is, however, a relevant springboard to examine the workplace practices of successful companies – successful in the context of achieving "Best Companies to Work For" status.

In the United States, Fortune Magazine has been identifying and publishing league tables of the 100 Best Companies to Work For since 1998 with the assistance of the Great Places to Work Institute in San Francisco.

In 2006, Kahler Slater published a review of the physical characteristics of Best Place to Work award winners, the hypothesis being that companies acquiring the status would share common workplace attributes. At the outset, the review was at pains to point out that a well designed office will mean different things to different organisations depending on their business, culture and methods of working. One company may have a need for distraction-free work for the majority of its workforce for the majority of the working day whereas another might thrive on collaboration, teamwork and knowledge sharing. This simple but powerful message is crucial – the notion of a well-designed office environment is highly subjective and relative to the organisation it is housing.

Prior to analysing the findings from questionnaires completed by occupiers employed by the 'great' companies, the researchers reviewed literature regarding workplace design, productivity and employee morale. The review process enabled the researchers to compile a list of attributes of the workplace that were considered to enhance productivity. Completed questionnaires were then assessed against the pre-determined attributes which, as can be seen from the table on the next page, reflect a blend of physical, social and cultural aspects of the work environment.

The economic argument

The findings of the research include the following:

Attribute	Best places to work typically
Distraction-free work	allow individuals to perform such work through use of privacy partition panels, non-assigned private spaces and ample meeting rooms
Collaboration and interaction	provide ample congregating spaces, cafes, coffee stations, conference rooms, huddle spaces and side chairs at workstations
Undistracted teamwork and meetings	provide various types and sizes of open and informal gathering spaces, conference rooms, dedicated team or project rooms and mobile furnishings
Accommodation of personal workstyles and workstation personalisation	demonstrate this characteristic through use of mobile furnishings and adjustable desks
Attention to thermal comfort	enable individual devices to augment environmental controls and incorporate small heating and cooling zones with accessible thermostats
Access to daylight	provide direct visual access to natural light for the majority of employees
Workplaces allocated by function	continued to allocate size and type of workstation based on hierarchy or title¹
Adjacencies that support work flow	adopt highly efficient and functional planning where most adjacencies are met
Accommodation of changing technology	provide full access to power and data, wireless technology and cable management allowing rapid changes of requirements
Expression of culture	supported and expressed the culture well

Notes

1. The tendency to allocate workplace by title or hierarchy rather than function is significantly less common in the UK than the US.

Evident from the above characteristics is the blend of attributes that, on the one hand, point towards physical solutions to physical problems. Other attributes suggest a true alignment between the specific workplace solution and:

- the objectives of the individual;
- the objectives of the or team; and
- the purpose of the business.

The research did not purport to be founded on scientific algorithms and statistical wizardry – it simply reflected that most 'successful' companies share common characteristics concerning the way the workspace is designed, managed and used.

So...

...it would seem useful to explore the extent to which the UK's Best Companies to Work For exhibit similar common characteristics and, if so, promote those throughout the business sector and beyond.

Chapter 6: Health and well-being

“Put the key of despair into the lock of apathy. Turn the knob of mediocrity slowly and open the gates of despondency – welcome to a day in the average office.” David Brent, *The Office*

As a manager, should I be concerned about the health of my workforce? According to the Chartered Management Institute, it has been estimated that the cost to UK employers of illness in the workplace is over £12bn a year (2007). And matters are getting worse – according to the Quality of Working Life Survey 2007, almost half of the managers consulted felt that sickness rates had increased over the last year.

Interestingly, but perhaps not surprisingly, there is also an emerging trend of employees ‘suffering for the cause’ - while this may not translate directly into official absenteeism levels, it appears to affect motivation levels. One might therefore conclude that productivity at work is suffering as a consequence.

In the public sector alone, the average number of sickness absence days is approximately 9 in comparison to over 6 in the private sector. While the figures across Whitehall Departments range from 4 to 12, a recent survey of local authorities in Northern Ireland undertaken by the Chief Local Government Auditor identified one council with an average annual absenteeism rate of more than 20 days.

And don't think it stops there: do you believe that employees with high absenteeism rates operate at full effectiveness when at work? More likely, there is a deep-seated malaise that needs to be tackled.

“Health issues should be driven by an understanding that improved health and well-being can generate significant employee productivity benefits...”

Chartered Management Institute, 2007

Absenteeism cannot be traced back entirely to the effects of the workplace. In many instances, the direct cause will be illness arising outside the work environment over which the organisation has virtually no control. A surprisingly large number of employees did however attribute a direct causal link in a Chartered Management Institute survey undertaken in 2007.

Nearly 50% of the 1,000 employees surveyed admitted to an absenteeism rate of 6 more sick days than the UK average because of poor office surroundings. Moreover, 84% of respondents agreed that their surroundings have a significant impact on their happiness and motivation – and perhaps also their productivity by implication.

So what can be done?

A holistic approach is recommended by the Chartered Management Institute that integrates job design, management styles and the working environment. The concept of job design relates to the extent of control one has over the way one works – in some senses, control over the working environment. There is a strong parallel between this view of job design and the rather more technical perspective of control over the working environment as a causal factor of occupier satisfaction.

The Chartered Management Institute also draws a conclusion that a well managed working environment contributes to productivity through good ventilation, appropriate control of noise, temperature and light and good quality air and water.

So...

...there appears to be incontrovertible evidence that the working environment directly impacts the health and well-being of occupiers, and exhibits a direct causal link to sickness and absenteeism rates. An implication is that real estate professionals and building designers should work closely with HR professionals to help ensure buildings are designed, and continue to be operated, as occupier-friendly facilities.

Chapter 7: Measurement of productivity



What is productivity in the context of the office environment? And how is it related to efficiency and the performance of the individual or organisation? But isn't the concept of effectiveness more aligned to that of productivity?

All these terms are used too loosely and often with the same intended meaning – but they are different.

Using fewer inputs may result in increased efficiency but won't necessarily deliver improved productivity – less space per person is more efficient but may lead to less perceived or actual privacy and more distraction. Using one person to deliver an output (say, a report) may appear more efficient but it could be less productive because the output is less rounded and considered as a result where securing views of different people is an important factor?

The property and facilities industries have become relatively obsessed with efficiency – it is easy to understand as a concept and easy to calculate as a metric and therefore can readily support the other Holy Grail of the professions, namely benchmarking.

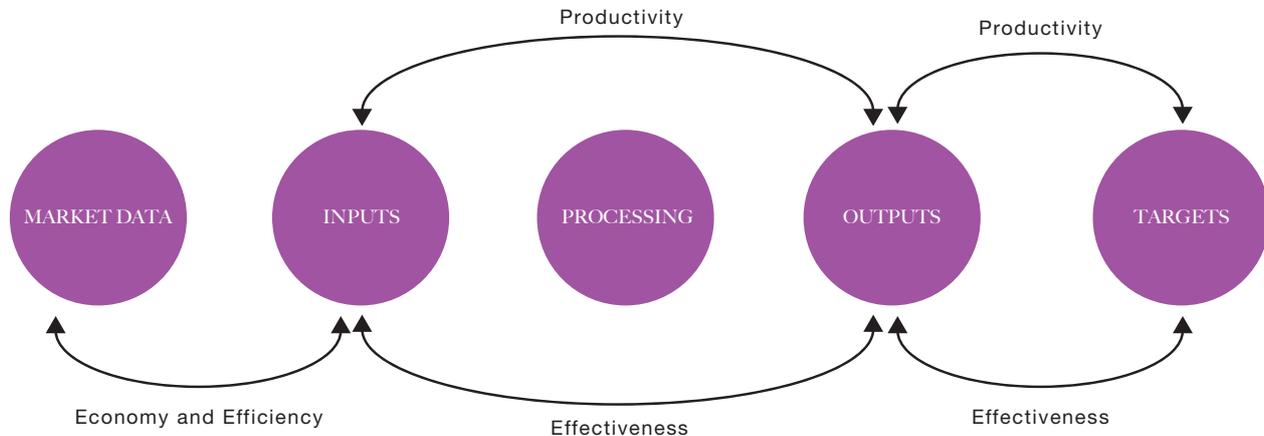
To be fair though, customers of space (occupiers) also talk about and demand greater efficiency at length – witness the government's various efficiency drives and agendas at central and local level. As this report was being finalised in July 2008, the government announced yet another review of the property assets held by the public sector under a wide ranging Operational Efficiency Programme. The Carter Review, an element of the overall programme will consider "...how efficiently public sector organisations are using their property, particularly office space."

At a corporate level, businesses have always sought efficiency – it is now being blended with other requirements such as effectiveness but efficiency will always remain on the corporate agenda.

Interestingly, the origins of the term Facility Management are worth recalling as it appears the facilities management industry has been subject to an evolution of sorts in terms of its focus, direction and language. In the 1970s, Facility Management was first used to describe a field of study that embraced "...the design and management of workplaces and their impact on the business conducted by the organisations that occupied them" (Price, 2007). But the common perception and perhaps reality now is that interior designers consider the design of the workplace, facilities managers manage the support costs of the workplace, financial or operating managers concentrate on the 'business end' and no-one forges the links envisaged forty years ago.

Measurement of productivity

Performance measures (in the office environment)



In an attempt to bring some clarity and consistency to the range and categorisation of performance measures that are adopted in the office environment, the process-oriented diagram above proposes the best fit for a number of performance measures.

From left to right, the first performance measure identified is ECONOMY – this relates the actual cost to a business of procuring the necessary inputs to the benchmark or market rates.

The relationship between two inputs, people and space for example, can be thought of as a measure of EFFICIENCY.

The PROCESSING work stream involves the office occupier in thinking, analysing, reading, writing, talking or perhaps creating.

The OUTPUTS of an organisation can be reports, creative ideas, or perhaps just the spoken word.

Typically, the performance measure entitled EFFICIENCY is seen as the relationship between INPUTS and OUTPUTS – getting more output from the same input is an increase in efficiency.

A third performance measure, that of PRODUCTIVITY, is also shown as a relationship between INPUTS and OUTPUTS – the difference now is that the dimension of quality must be added in. Becoming more efficient but with a drop in quality cannot be described as increased productivity. Similarly, productivity can be enhanced if the same resources are used to deliver a higher quality output, even if the same 'number' of outputs are produced – in other words, efficiency doesn't change.

The outputs of a business, its TARGETS or OBJECTIVES, can be quantifiable or less tangible depending on the nature of the business.

The final performance measure depicted connects OUTPUTS and PRODUCTIVITY and is EFFECTIVENESS – how successful we are in achieving our goals.

These concepts and performance measures are often used liberally and inconsistently when assessing businesses.

What distinguishes the performance measures of PRODUCTIVITY and EFFECTIVENESS from the other measures is the notion that we know where we are going, we know what the organisation has to achieve and we can measure the success of the organisation in achieving these targets. However, we are moving rapidly into a business environment comprised almost solely of knowledge workers and little else if some commentators are to be believed. If this is so, we will face commensurate challenges to define with clarity the output of an increasing proportion of the workforce.

Even today, many organisations are associated with policy making, regulatory enforcement, the provision of consultancy services and other activities that may not have an evident beginning, middle and end.

So...

...if the organisation as a whole is unclear about its flight path and destination, it is not inconceivable that individual members of the organisation find it a challenge translating corporate objectives into personal goals. This state of affairs is not helpful if we wish to assess individual productivity.

Measurement of productivity

Measures of productivity

So, what are the commonly used approaches to measuring productivity in the office? Research suggests that there are five common approaches:

- self-assessment of productivity – this typically involves asking respondents to note on a scale the extent to which an environment or an environmental condition supports their productivity. Arguments exist among researchers about the robustness of self-assessments. On balance, it is felt that they offer a sufficiently robust means of indirectly assessing productivity;
- measurement of actual output – this may suit certain office based organisations, such as those processing claims or dealing with other routine processes, but is unlikely to suit the majority of businesses;
- amount of time spent – this approach considers the amount of time gained through efficient filing systems for example, and the amount of time lost by continually having to clear desks or log onto computers and phone systems;
- absenteeism due to illness; and
- indirect indicators – these include the extent to which one can concentrate properly or how quickly one can solve a problem.

Self assessment of productivity

It is commonly considered that self assessment of productivity is a reliable indicator of actual productivity. If you feel you are productive, you probably are. If you feel a change of physical circumstances has made you less productive, once again you probably are. Matters totally or only loosely related to the working environment might, however, come into play. For example, it is not unknown for amendments to terms and conditions of employment, or an unsatisfactory pay increase, to be reflected back as apparent dissatisfaction with the working environment and reduced self-assessment of productivity.

When asked about the impact of aspects of the workplace on productivity, there is much correlation between the findings. The variables agreed as having a positive impact on (self-assessed) productivity include:

- access to informal meeting spaces;
- space for team projects;
- common areas to permit informal interaction;
- comfortable temperature and humidity;
- controllable temperature and ventilation;
- tidy and visually appealing;
- conversational and visual privacy;
- amount of storage and workspace; and
- a place to work free from distraction.

It is acknowledged that many factors, including the working environment, influence an employee's perception of their productivity. In a study of occupiers in central and local government and private corporations in the UK, between 75-80% of respondents stated that their workplace was either an important or very important influence on their productivity.

In a survey by Gensler, managers were asked to assess how employee productivity would be increased if the workplace was improved. Across a range of professions such as legal services, media and publishing, the average reported increase was 19%. The top three factors that are believed by managers to improve employee productivity are:

- better light/daylight;
- more breakout/meeting space; and
- more personal space/better use of space

It is interesting to speculate about what employees might have regarded as the top three actions to be taken by management to increase productivity overall.

Interaction between employees (at a time when they want it) is universally regarded as the largest positive contributor to productivity while distraction is the most significant detractor.

However, it is not just about the design itself. Where new workplaces have received favourable ratings for interaction and neutral or positive ratings for distraction, it has been found that:

- all staff have been involved;
- there have been processes of consultation and user engagement in the change processes; and
- working protocols have been established for the use of space.

So...

...workplace design must not be regarded as a discreet activity but a link in an integrated process that starts with understanding what people need of their workplace to do business, and ends with an understanding of how the design has worked in practice – there must also be a feedback loop to re-engineer aspects of the design to fit the changing needs of people and the business over time.

Measurement of productivity

Productivity and satisfaction

The assessment of productivity and its link to the workplace is evidently not a straightforward task. As a means of circumvention, some researchers have opted for the measurement of occupier satisfaction with the working environment as a proxy. The theory is as follows – a satisfied employee will, through the mechanism of being motivated to act, be more productive. Similarly, a dissatisfied employee will, by reason of being demotivated, display lower productivity.

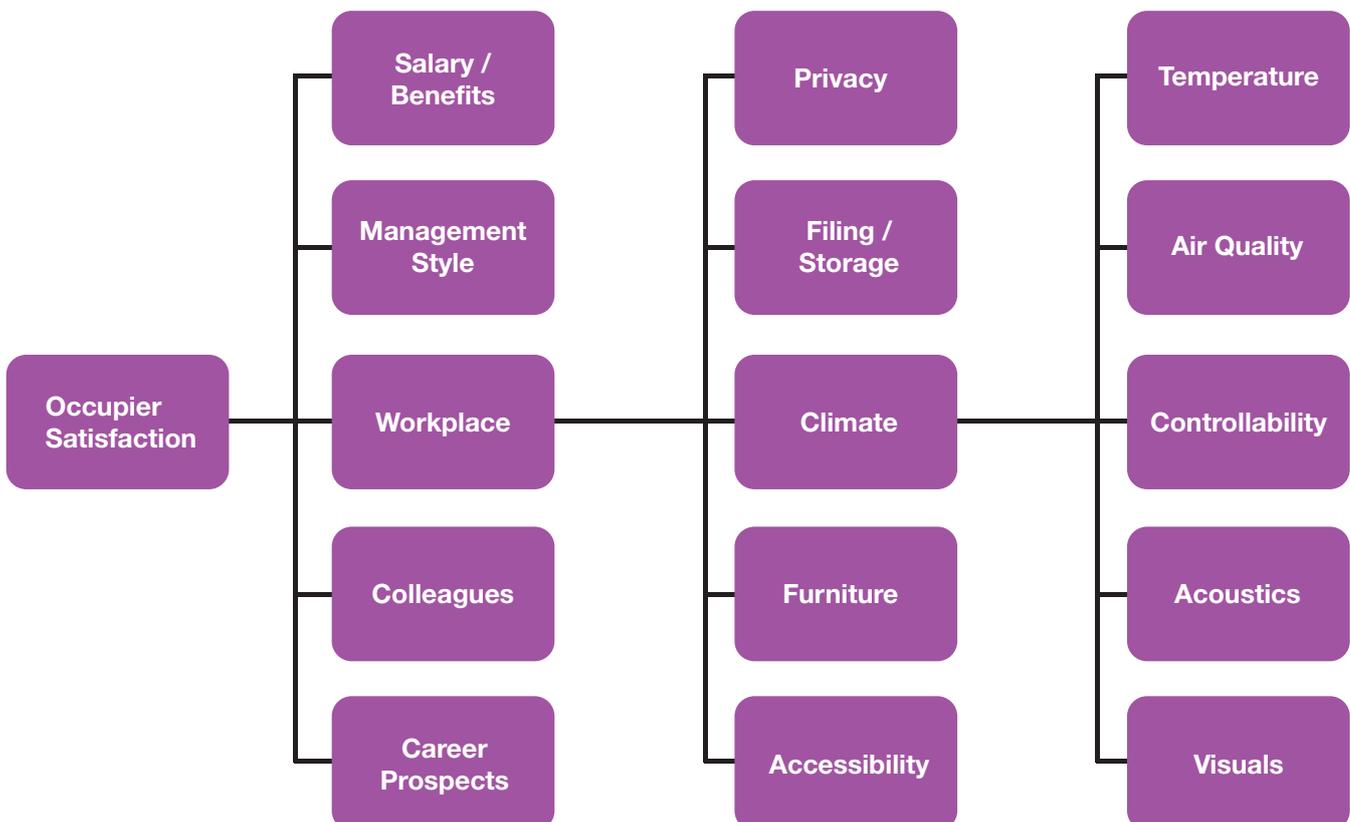
Although this philosophy runs counter to the conclusions reached by Herzberg and Maslow – that 'low level' needs associated with the working environment are unlikely to motivate but can create dissatisfaction – there is a degree of acceptance that it holds good in practice.

Following a rigorous review of literature by van der Voordt (2003), it was concluded that "...there are clear links between motivation and productivity, absenteeism due to illness, involvement in the organisation and employee satisfaction."

As indicated below, there are multiple influences on an employee's level of satisfaction. And there are many drivers behind an employee's satisfaction with the working environment. Caution is therefore required in the interpretation of research findings that appear, at first glance, to establish a clear and direct cause and effect relationship between a variable and overall levels of satisfaction or simply satisfaction with the working environment.

So...

...if we believe that a link does exist between the level of satisfaction with the working environment and levels of productivity, the real challenge is to establish a series of consistent and clear questions, coupled with a statistically robust sampling and data analysis methodology, and apply this over time and across a spread of office users in both steady state environments and periods of change.



Adapted from Van der Voordt, 2003

Chapter 8: Management of change



Intuitively, it seems prudent to engage with employees, or employee representatives, prior to overhauling a real estate portfolio through relocation, rationalisation or even refurbishment – unless one sides with the scientific management theorists of today. However, intuition alone is not a sufficient reason to invest time and money in the process of engagement. And does the extent and nature of engagement have any impact on the productivity of those affected by the overhaul?

There has been relatively little research into the importance of effective engagement and how this may impact on productivity in the event of a real estate portfolio overhaul. With so much organisational churn throughout the economy, and little prospect of the rate of change declining, one wonders how many opportunities are being missed through the mishandling of change.

In 2002, Denise Laframboise and her colleagues at Public Works and Government Services Canada wrote of their combined experiences in support of an office portfolio housing over 180,000 civil servants. At the time of reporting their experiences, the government was undergoing significant change – an initiative entitled ‘Workplace of Choice’ deployed to modernise facilities

was well under way along with supporting accommodation policies and working processes. Its aspirations are common to many workplace change strategies being implemented today and include:

- space to be allocated by grade not function;
- employees to have access to a range of work settings such as team areas, ‘lounges’ and private study areas;
- individuals to have a degree of control over their immediate environment through the use of task lighting, temperature control and adjustable furniture; and
- opportunities to be made available to work from home or in satellite offices enabled by investment in infrastructure.

While the initiative was designed to support employees and enhance their working environment, it was met with resistance in some quarters. What the government agency failed to appreciate at the outset was that the flight path is as important if not more so than the end destination. The end destination – a more attractive and supportive place of work – was, to use Herzberg’s terminology, a hygiene factor whereas the proponents of the change believed it to be a motivator.

Management of change

Some scenarios cited in the research by Laframboise et al are summarised below, the focus being on change projects that did not quite meet the intended objectives:

Scenario 1 a relocation from an old building characterised by cellular offices and with cheap and plentiful parking and available day-care facilities. The destination was an open office environment with limited and relatively expensive parking facilities and no readily available day care facilities. An intensive communication strategy was implemented but, as revealed in the post occupancy evaluation questionnaire, it failed to involve employees directly in the design of their new workplace based on the jobs to be performed. Lower levels of satisfaction with the new workplace were encountered compared with expectations. Many employees cited productivity as being negatively affected with resistance being shown one year after the change occurred. Unfortunately, this project had been selected as a pilot project for the roll out of a wider change programme!

Scenario 2 a well-executed communication programme appeared initially to tackle resistance to a major internal change programme through the use of a cohesive project team and an ability to demonstrate the expected benefits of change. Such was the enthusiasm for change that the team volunteered to be 'guinea pigs' to test out the new working environment. However, the absence of a clear vision at the outset enabled new management to redirect the project prior to roll-out. Resistance evolved rapidly to the point of halting the project – employee morale dropped significantly (and productivity also is assumed to have suffered) and there is no doubt that future change projects would become more difficult to 'sell'.

The authors emphasised the roles of management in facilitating change and breaking down resistance at two levels – senior management and middle managers. As long as resistance exists, it is fair to conclude that productivity will not be optimised.

Senior management must be clear about the corporate culture of the organisation and how receptive it is to change – perhaps not an easy task for managers who have grown up and been nurtured by the organisation for decades. In addition, senior management must understand if recent events might affect people's perception of change and how others see the ability of management to implement change. Finally, through leading by example, resistance to change can be stemmed.

Middle managers are often those who 'lose' most out of accommodation change projects by giving up their private offices. Apart from not signing up to the strategic worth of the project, they may even discourage others from supporting change. The communication strategy must therefore ensure that middle managers are clear of the benefits of change, and are granted certain leadership opportunities throughout the change project to the point where they are personally motivated to bring about a successful project.

If resistance to change and productivity are negatively correlated, the effective management of change must become an integral part of strategic accommodation projects involving relocation, rationalisation and refurbishment of space whereby a new working environment is created. At the operational level, the working environment is often subject to relatively minor changes in its configuration and design in between the seismic shifts described above. Those with responsibility for designing, managing and implementing the rather more regular organisational churn projects would do well to remember that pockets of resistance (and dampened productivity?) can become an equally regular, if less visible, feature of corporate life.

The recently published case studies by BCO, in support of the 'sister' research by BCO-CABE, amply demonstrate the practical business benefits of user engagement in the thinking behind workplace design, and the implementation of the change programmes (2006). Disappointingly, however, it is reported in one case study that "...in reality the extent of the impact which staff can have on any project is normally limited to issues such as colour and orientation." It is to be hoped that constructive and meaningful engagement is more commonplace.

Chapter 9: Drivers of increased productivity

Earlier in this report, passing reference has been made to a number of research projects in relation to, for example, the 'value' of office-based employees, the fact that employees are social animals with a range of needs and the harnessing of productivity by tackling resistance to change.

At this point, some research findings that attempt to forge a direct link between variables in the office environment and levels of productivity.

What is clear, and perhaps comforting, is the degree of consistency between survey findings over time despite some research projects being founded on what might be best described as shaky foundations.

Various physical aspects of the internal environment are now considered in turn followed by a tabular summary of findings from a range of research studies undertaken in the UK and elsewhere.

Temperature

It should not be too surprising to learn that performance levels of workers, whether in the office or factory environment, drop off when it gets too hot or too cold – yet that is the finding of many research projects conducted over extended periods of time. In other words, there is an optimum temperature or band of temperatures to maximise performance. This is true particularly when considering the effects of temperature on physical performance although the link is less evident when considering effects on mental performance. To put it another way, the band of temperature that secures optimum mental performance is wider. Despite this finding, building management systems are typically operated to achieve a narrow spread of

'acceptable' temperatures in the office environment.

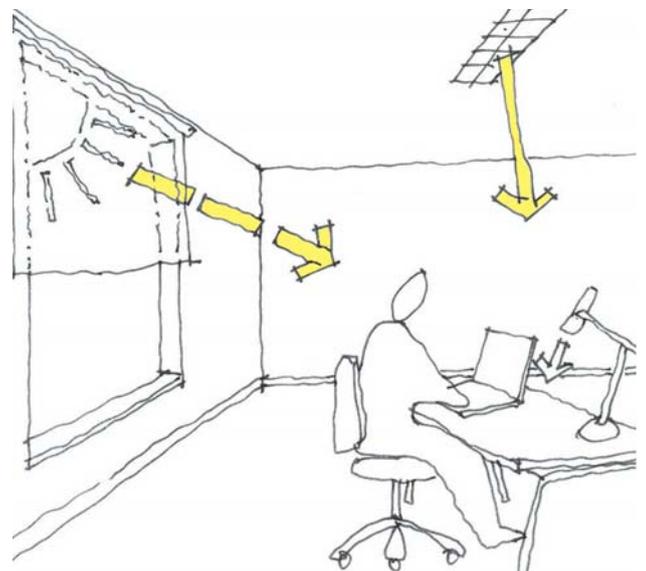
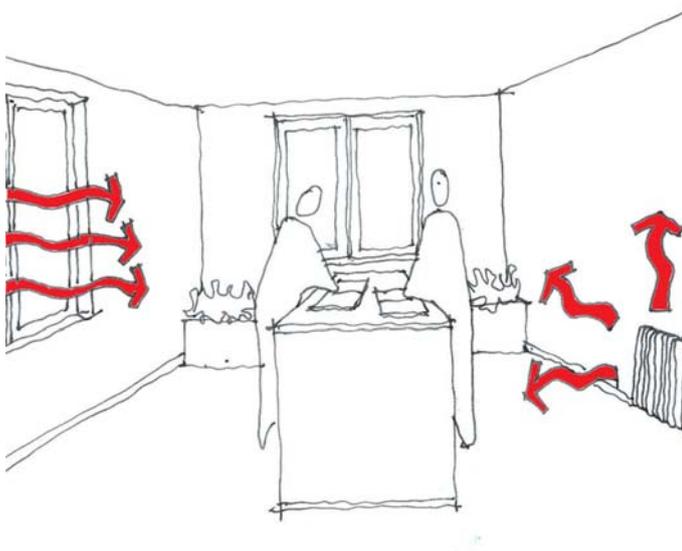
Wyon (1974) found that typewriting speeds were approximately 40-50% slower when temperatures rose from 20°C to 24°C. In a later study, Wyon et al (1979) concluded that certain office-based tasks can be improved by temperatures up to 26°C. Interestingly, when other tests were performed (assessing creativity, spelling, vocabulary and manual dexterity), the researchers found no material difference in performance as the temperature levels changed within a broad range.

What the above research shows, if anything, is that the 'ideal' temperature for a specific office-based activity may not be 'ideal' for another activity – or, occupiers are more resilient than is imagined and can cope adequately with a range of temperatures

Lighting

There are many lighting variables that are considered to have an impact on productivity – illuminance, glare, reflection, task contrast, size and complexity of visual stimuli.

Slater (1984) found that task lighting had the greatest impact on performance compared with down lighting and side lighting. In terms of the relationship between lighting levels and performance, Saunders (1969) found that performance levels increase until a saturation point is reached whereby further increases in the lighting levels have no discernable impact on performance. During a study of insurance company employees conducting relatively complex paper-based tasks, Barnaby found that increasing illuminance from 550 lux to 1100 lux increased



Illustrations by Woods Bagot 2008

Drivers of increased productivity

performance by almost 3%. A further increase to 1600 lux increased performance by more than an additional 8%. Users rated the higher levels of illuminance as less stressful, more motivating and more productive. In the same office where reading was not such a high priority, users considered that the office was over-illuminated.

Nor surprisingly, therefore, research has confirmed that there is no single optimum level of lighting even for office workers in an open plan environment where one might conclude, rather simplistically but conveniently, that open plan must equate to standardisation.

The Institute for Research in Construction, with support from Public Works and Government Services Canada, conducted research into lighting levels in the office environment and concluded that there is no generic, ideal illuminance level – lighting levels should be capable of refinement to match the task demands and individual employee preferences. Furthermore, it was found that any particular lighting level is only likely to satisfy approximately one half of all occupants at most.

The tendency, therefore, is for professional and regulatory bodies to recommend ranges of acceptable levels of illuminance. Equally prominent in the body of research into office lighting is the recommendation that background lighting be supplemented by task lighting. Personal lighting control can improve environmental satisfaction and self-assessed task performance, and allow users to tailor their own lighting conditions to their needs without encroaching on the needs of others.

It would also appear that the mere presence of individual task lighting control is sufficient to induce higher performance (Cakir, 1991). Employees being provided with

desk lamps, irrespective of their quality, was found to be enough to create a favourable impression of the work environment. This finding was confirmed by Raw et al (1993) who found that high perceived control over lighting was related to increased perceived productivity.

A combination of automatic and self-actuated controls in the office environment achieved quite dramatic results in a survey reported by Ure and Denham at a CIBSE conference (1997). The lighting system was upgraded in part of an office building to provide occupancy detection, automated dimming linked to outside lighting levels, constant illuminance control and the ability to set lighting levels at specific levels at pre-determined times during the day. Over a period of one year, the occupants maintained a diary of the incidence of headaches and eyestrain. The incidence of symptoms was found to have decreased by 25% in the part of the building subject to the lighting controls, compared with the remainder of the building.

Too much choice might however be a bad thing. Researchers have found that too many controls, or complicated controls, can induce stress as focus is removed from the primary task of work with too much time being spent learning about environmental controls (Wineman, 1982).

Noise

Following a comprehensive review of the available literature at the time, Kryter concluded that noise can have a positive, negative or zero effect on performance. (1985) Loud noises have been found by others to stimulate and briefly enhance productivity as a result – until the effect is mitigated as one becomes accustomed to the noise level. But stimulation in itself in the office environment is not

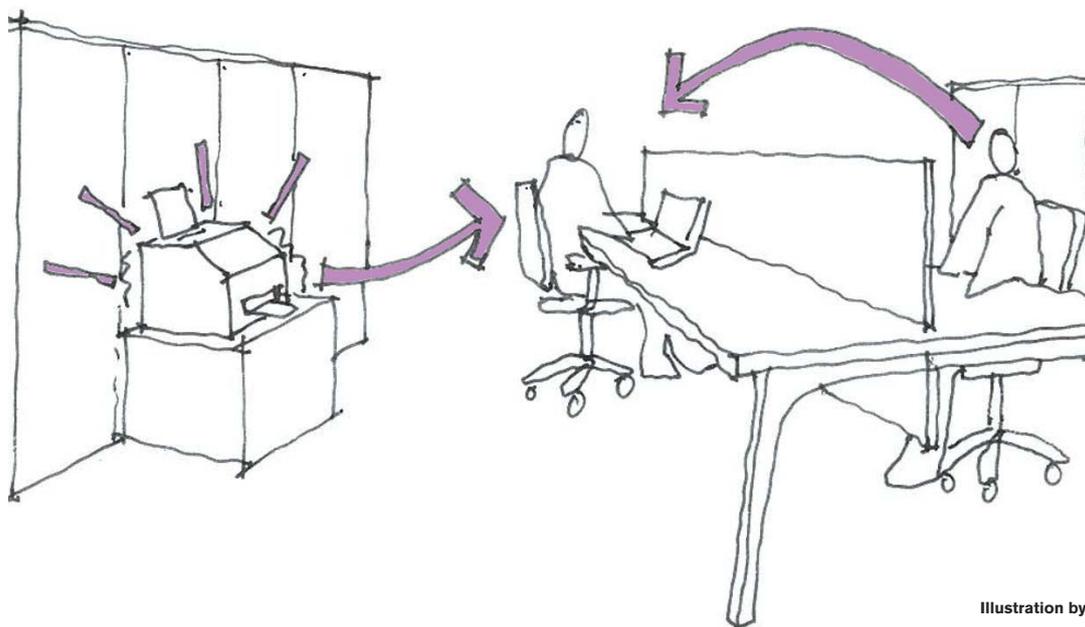


Illustration by Woods Bagot 2008

Drivers of increased productivity

necessarily a good thing – unpredictable noise has been found to increase arousal levels but such noises also require more attention and cause distraction. Telephones ringing, doors banging, mobile phones ringing and co-workers shouting across the room could all be termed unpredictable noise, unless they occur with such frequency as to become the norm.

Studies of typists in 'calculating operators' in an insurance company revealed a significant increase in productivity levels after sound absorbing material was introduced reducing the noise levels from 41 dB to 35 dB. (Wilson, 1952) However, these findings have been questioned since the replacement of sound absorbing material with wallpaper a year later, with an associated increase in noise levels to the former basis, met with sustained performance at the same (increased) level after an initial dip. The unintended consequence may of course simply be due to the Hawthorne effect, the phenomenon whereby productivity was found to increase because workers felt they were being paid attention to.

Despite the above unsatisfactory research carried out many decades ago, noise in the office environment has now become more of a science – the so-called Privacy Index quantifies the level of speech in the office taking into account the geometry of the room, layout of furniture and the material used for ceilings, walls and floor coverings.

Within an office, the cause of distraction is not noise as such but the ability to understand sentences to the point of becoming absorbed in the discussions of others.

Consistently, speech distraction is the most commonly reported problem associated with open plan working – and the problem is getting worse with higher workstation densities, quieter HVAC systems and the wider use of mobile phones within the office.

The ability to support distraction-free 'quality' time is generally regarded as a prerequisite for a productive working environment

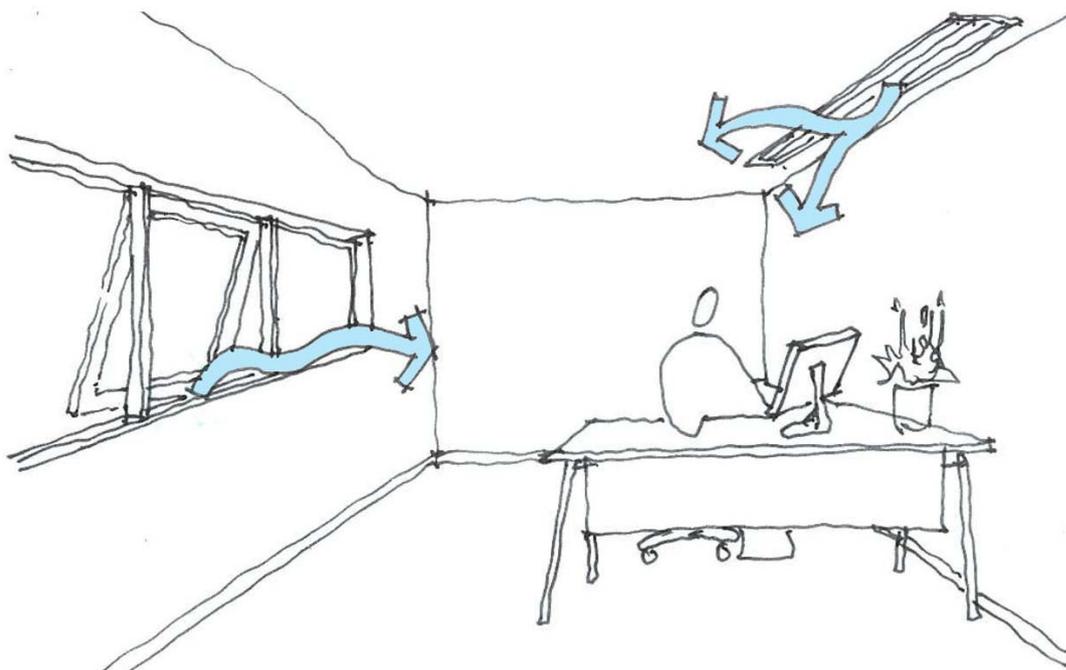
Air quality

The indoor air quality is determined, to a large extent, by the building's ventilation system and the contents of the building. The term 'contents' includes occupants, equipment and other materials that can create contamination. With the increasing trend towards open plan offices comes the increased likelihood of contamination concentrations due to higher densities of occupants, equipment and furnishings.

In practical terms, poor air quality can make it harder to concentrate and work effectively leading to symptoms such as headaches, drowsiness or eye, nose or throat irritation.

Researchers have recorded that approximately one third of all employee sick leave is due to symptoms caused by poor air quality (Mendell et al, 1999). The table on the next page summarises the relative prevalence of various symptoms experienced by those in buildings with poor air quality.

A single source of contamination, in the form of a contaminated carpet, was found to have a marked impact on the typing speed and error rate of occupants in an office building



Drivers of increased productivity

(Wargocki et al, 2002). In addition, the occupants of the office experienced more headaches, nose dryness and throat irritation than the control group. These findings could not be attributed to the Hawthorne effect!

Similarly, Kemp and Dingle (1994) found high levels of formaldehyde and volatile organic compounds in an office in Australia. To counter these findings, the fresh air intake into the air conditioning system was increased to 100%. The resultant increase in productivity was approximately 3% and the number of times that workers left their desks reduced significantly.

Reporting on various studies into local government departments in the UK, USA and Denmark, Abdou and Lorsch (1994) noted large numbers of health complaints that were felt to have an impact on productivity. The authors concluded that "...both ventilation/air movement and humidity can have a profound effect on productivity in the workplace: however they cannot be singled out by themselves."

While one might find the research methodology somewhat suspect, the findings of research carried out by the Building Owners and Managers Association in 1988 are quite striking. No less than 4,000 space planning executives were surveyed and asked:

- what is the worst management, operation and design problem; and
- what would be the productivity improvement if that problem was solved.

HVAC problems were noted as worst by the most respondents – and they estimated that resolving the problem would result in, on average, a productivity increase

of 18%. Having reviewed evidence from various surveys and research projects, Woods concluded independently that "...we could increase the productivity of 20% of our workforce simply by improving the air quality of most of our offices" (1989). A significant correlation was found between the percentage of occupants dissatisfied with air quality and the numbers of occupants who felt it affected their productivity.

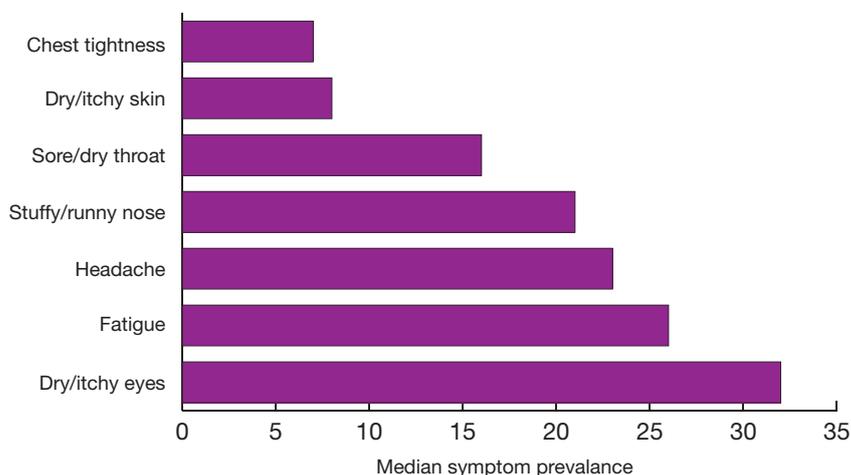
As with many other aspects of the working environment, such as temperature, noise and lighting, those with responsibility for managing the building and its facilities have the potential to influence the extent to which the office environment quite literally creates a climate for improved performance or sickness, demotivation and, as a result, reduced productivity.

Controllability

Arguably the most widely-reported research project that highlighted the importance of controllability of the internal environment was that reported by Leaman and Bordass (2000).

The objectives of the authors were to identify the most effective building systems design and management strategies to achieve improved productivity at work. Drawing on research available at the time, Leaman and Bordass concluded that "...losses (or gains) of up to 15% of turnover in a typical office organisation might be attributable to the design, management and use of the indoor environment." Knowing that there is a vast range of variables that impact on occupier productivity, which are the most important? The 'killer' variables were found to fall into four clusters, one of which was entitled "personal control".

Symptoms experienced in buildings with poor air quality



Source: NIOSH, 1999

Drivers of increased productivity

Since the 1980s, research has drawn a link between tolerance of building conditions and the extent to which the occupier has control over these conditions, and that the perception of control over one's environment affects one's comfort and satisfaction. Leaman and Bordass built on these earlier findings and carried out field research at a range of office buildings in the UK during 1996-97 – it was found that self-assessed productivity was significantly related to perceptions of self-control over the internal environment of the office. They concluded that, "...in study after study, people say that lack of environmental control is their single most important concern, followed by lack of control over noise."

If the relative importance of the variables has shifted over time, or will shift in the future, it matters little as the overarching message is clear – people aspire to have control over their working environment, just as control over the work we do and the way we work are the norm for many office workers. Indeed, these characteristics are positively encouraged by some enlightened employers.

Workstation design

A desk is a desk surely? Bearing in mind that office-based employees spend 30% or more of their waking hours each year in their offices, it is entirely proper that workstation design has become not just an art but also a science.

In a survey of occupants of nearly 800 workstations in public and private sector organisations across Canada and

the US designed to explore views about the physical conditions of the office, respondents ranked air quality and ventilation as being of prime importance (Veitch et al, 2003). However, privacy and noise levels were ranked second and third respectively in importance – clearly, the design of the workstation is critical in influencing these latter two aspects of the office environment.

So, having few barriers in an open plan environment might prevent employees from achieving the degree of privacy required to perform knowledge based work – in some working environments, the 'study booth' has become a place of refuge from the crowd at the risk of contravening corporate policy on the use of these shared spaces.

The COPE (Cost-effective Open Plan Environments) series of research studies concluded, among other things, that acoustic privacy is deemed to be achievable if desk partitions are at least 1.6m in height (Veitch et al, 2003). Pre-dating these studies, BOSTI (Buffalo Organisation for Social and Technological Innovation) found that increased enclosure was associated with higher self-assessed job performance (1984). More particularly, the organisation concluded that the single most important factor impacting on individual performance, group performance and job satisfaction is an individual's ability to work in a setting that is free from distractions.

Turning to office furniture, a study by Springer (1986, cited in Brill) into the office systems used by a major insurance company determined that the best ergonomic furniture improved performance by 10-15% over normal conditions.

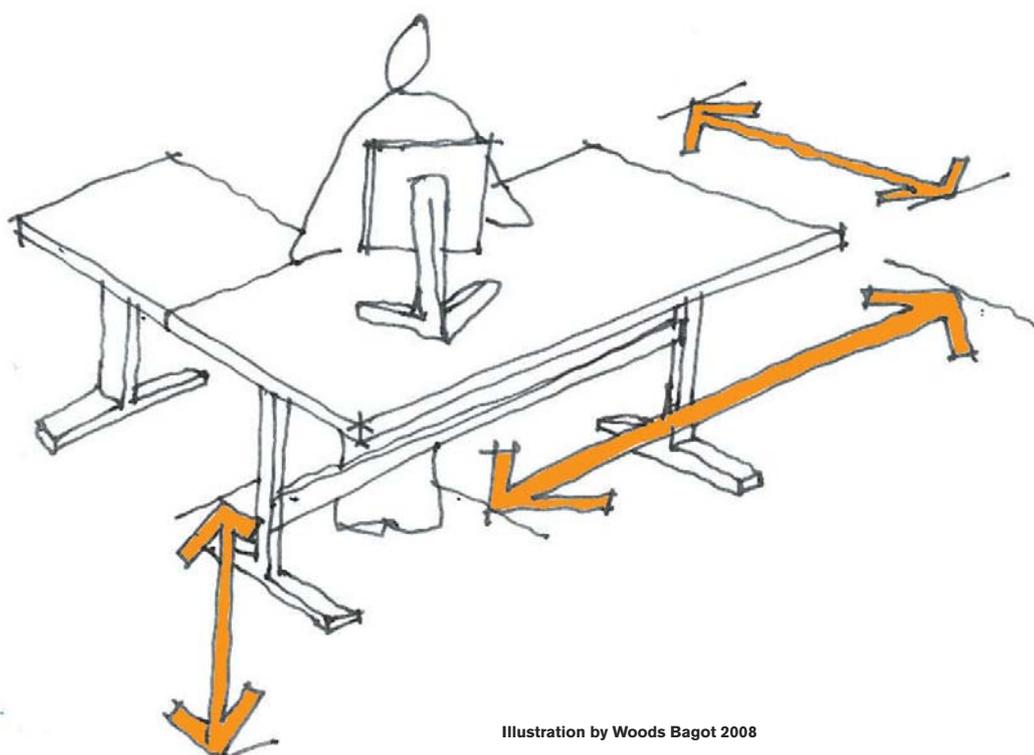


Illustration by Woods Bagot 2008

Drivers of increased productivity

Brill cites another example of an insurance company that upgraded its furniture while renovating its building (1992). It was found that productivity increased by a massive 53%, absenteeism dropped 14% and job satisfaction increased substantially.

Poorly considered or, more typically, arbitrarily determined workstation designs have the ability to communicate perceptions held by management of employees – instead of showing respect to the needs of employees, it is all too easy to reflect an apparent disinterest and disrespect by assuming the employee will fit his or her tasks to the workstation provided rather than providing a fit for purpose design.

A study by DeMarco and Lister (1985) into the accommodation needs of software developers found that the most influential factor affecting job performance was the degree to which the physical environment suited the particular task in hand. The above comments suggest that office environments should be designed from 'inside out' starting with the work or tasks performed, the needs of the individual and the needs of the work group.

Configuration

The open plan vs. cellular office debate has been aired for many decades. An open plan environment can:

- foster communication and interaction;
- enable changes in configuration to occur more quickly and cost effectively;
- allow more workstations to be provided per sqm. of office space; and
- signal greater 'equity' within the office environment.

However, the level of distraction brought about by a high 'density' of communication, noise and interaction may inhibit productive work where productivity is dependent upon periods of contemplation and clear thinking, or where confidentiality is an essential element of the job.

There is no right answer – the configuration must fit the business need. As more and more business activity is contingent upon group working and the social aspects of work become more fully recognised, what can be said without fear of contradiction is that we will not regress to the days of long dark corridors flanked on both sides by cellular spaces for individuals.

Physical factors – summary of evidence

It is apparent that a range of physical factors in the workplace can impact on productivity, and some to a very significant degree. The productivity benefits cited in some of the studies mentioned are summarised along with evidence from other studies. It is not clear how productivity was defined and measured in all of the studies. What is clear, however, is that a variety of research methodologies were adopted including the use of laboratory simulations along with more robust 'real life' testing of hypotheses in an office environment.

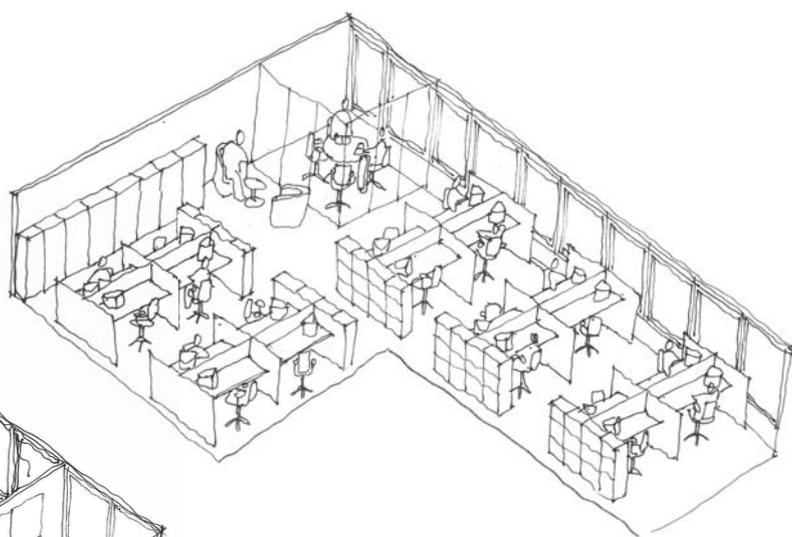
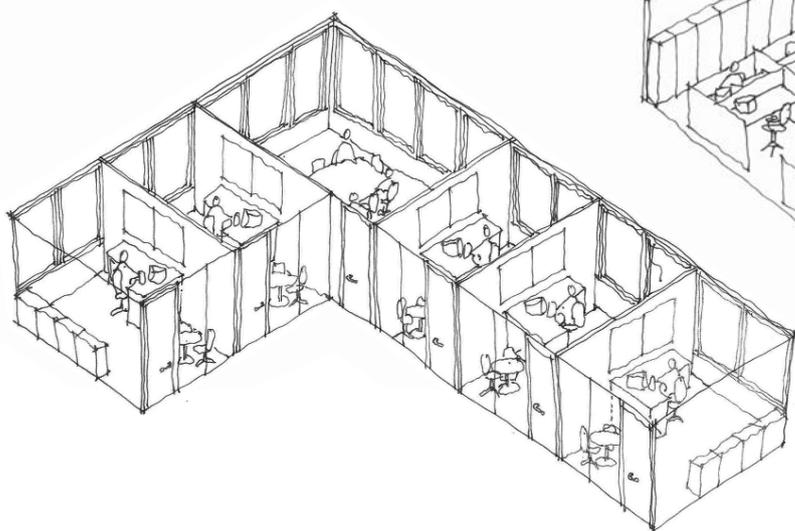


Illustration by Woods Bagot 2008

Drivers of increased productivity

Productivity Issue	Source	Impact on productivity
Increased illuminance for paper-based work	Barnaby, 1980	+2.8%
Introduction of uplighting for VDU work	Hedge et al, 1995	+3.0%
Lighting upgrade in drawing office	Romm & Browning, 1994	+13.0%
Sound absorbing material in typing pool	Wilson, 1952	+29.0%
Uncomfortable conditions in typing pool	Wyon, 1974	-40.0%
Increased fresh air intake to dilute pollutants	Kemp & Dingle, 1994	+3.0%
Move from natural ventilation to air conditioning	Sterling & Sterling, 1983	-6.0%
Comparison of natural ventilation to a/c offices	Oseland, 1995	+3.0%
Control over environmental conditions	Drake et al, 1991	+9.0%
Control over environmental conditions	Kroner et al, 1994	+2.8%
Refurbishment of office	Kroner et al, 1997	+12.9%
Bank refurbishment	Romm & Browning, 1994	+15.0%
New furniture	Sullivan, 1990	+15.0%
Properly designed workstation	Springer, 1982	+10.0%
General improvement in office environment	Wyon, 1993	+15.0%
General improvement in office environment	Brill et al, 1984	+15.0%

Some studies undertaken with the intention of linking tangible variables, such as air quality, temperature or lighting levels, with productivity or the performance of employees have landed upon adjacent and associated fertile ground for research almost by accident. The complexity of the working environment is stressed by many commentators as if by way of a cautious health warning. This fact was of course known to those who have studied the psychology of the workplace.

For some decades now, the facilities management profession in particular has been alive to the social and psychosocial attributes of the workplace. A wider awakening is called for among all professionals and players in the vast industry that is property procurement, design and operation.

The report now considers sustainability but from a perspective that expands on its usual meaning – a new meaning that helps form the glue between the design of the workplace and the output of its occupants.

So...

...despite some weaknesses in research studies, the body of evidence is substantial – a casual link between physical factors in the workplace and the productivity of employees exists ignoring, for the moment, the subtleties surrounding definitions and measurement techniques.

Chapter 10: Sustainability

The sustainable workforce

At this point, it is worth revisiting the core purpose behind the creation of buildings, namely, to accommodate a business or other organisation and enable it to meet its core purpose.

For various reasons, those involved in the design, development, disposal, procurement and management of buildings are not totally aligned in their focus on the needs of the occupier – while that ideal will never be achieved, the industry can at least work towards a greater alignment of interests of all parties.

If that precious resource, the occupier, is to be truly valued and nurtured, we must identify ways to capture and sustain the commitment, enthusiasm and 'corpus of knowledge' of occupiers for their own personal benefit, the benefit of the groupings within which they work and the benefit of the employer – in other words, create a sustainable workforce.

The design of the workplace is a factor in translating ideas and other inputs into productive outputs but it seems clear that it is only part of a chain or web of inter-related 'productivity influencers'.

The sustainable workforce can only become a reality if the following pre-conditions exist as a minimum:

- the business needs of the organisation are understood and translated clearly into a need for various work settings over time;
- the occupiers physical, social and psychosocial needs are met in the workplace;
- the workplace is managed as a social setting and not just a technical challenge; and
- effective systems are in place to identify the changing needs and perceptions of occupiers – and react to those as appropriate.

Efficiency and effectiveness

Can a sustainable workforce be supported in the face of consistent and increasingly robust drives for efficiency?

Efficient government, for example, is more than a praiseworthy objective – it also happens to be the title of a Scottish Government initiative designed to realise enormous savings to the public sector, and property asset management is one of the initiative's key themes.

At a UK level, the recently published NAO report entitled "Improving the Efficiency of Central Government's Office Property" (2007) stresses the financial benefits that could arise through the more efficient use of office accommodation. And this was followed up in March 2008 by a letter to all government departments from the Chief Executive of the OGC setting out space targets for new and refurbished office accommodation. To be fair, the letter added that "...it is vital that the effect on sustainability, productivity and other aspects of effectiveness are not compromised."

In parallel, much of the private sector continues to consider simple property cost metrics and efficiency measures to a greater or lesser degree.

What is clear is that a workplace solution that achieves efficiency and effectiveness (or productivity) objectives in parallel and without compromise to either is not just a desirable outcome of property asset management planning, it is a must.

The danger is that drives for efficiency will throw up what appear to be and indeed are in reality very tangible short term occupancy cost savings – but at a very high cost to the sustainability of the workforce.

Efficiency and effectiveness are not necessarily inconsistent objectives. Planning for one must, however, be done with full regard to potential unintended consequences such that all consequences become planned and intended and of course desirable.

So...

...can a pragmatic route map for a sustainable workforce be developed that allows both 'E's' to be achieved in parallel? Those with a responsibility for promoting efficiency have a parallel obligation to promote openly the challenges and their solutions that ensure workplace productivity is also enhanced as an essential by-product of the process.

Chapter 11: Design for occupancy

The workplace is a complex system that brings together people, building technology and infrastructure and a blend of hidden and visible people, processes and activities that sustain the working environment – that blend is the facilities management function.

Facilities management and productivity

In 2007, the Property Industry Alliance (a group comprising the RICS, British Property Federation, Investment Property Forum, British Council for Offices and CoreNet Global) commissioned a survey of occupiers that resulted in the production of an Occupier Satisfaction Index.

The research report revealed a sufficiently worrying gap between the activities and needs of landlords and their advisors and the needs of occupiers.

It is not clear if this mismatch between supply and demand has any impact on the productivity of occupiers but it is reasonable to assume that there is some connectivity.

At another level, there appears to be very little research into the impact of facilities management practices on the productivity of occupiers. This is somewhat surprising given that facilities management, in the form of day to day service delivery of property support services and the management of those services, necessarily involves or requires a direct interface between those engaged in facilities management and occupiers.

Research by Campbell and Finch (2004) concludes that "...it is clear that achieving high levels of customer satisfaction [in relation to facilities management service delivery] is contingent not only upon delivery of end products and services, but also upon the management processes that support these."

The management processes referred to include effective two-way communication with 'customers' and the adoption of a 'customer's representative' role if improved customer satisfaction is to be achieved.

So...

...a move within the facilities management industry to treat occupiers as customers could lead to increased customer satisfaction with the working environment – to be followed by an increase in the productivity level of those customers.

Post Occupancy Evaluations (POE)

The design and facilities management world is quite correctly enthused by the potential value of a POE – it can validate assumptions, track benefits, identify deficiencies with a new environment that may be rectified prior to a wider roll-out and it can provide an excellent opportunity to engage meaningfully with occupants.

Unfortunately, there is no standard methodology making comparison between POE findings a real challenge in practice. And without a pre-occupancy evaluation – or stock-take of an existing situation – a 'before and after' assessment and therefore a more accurate assessment of benefits arising out of the change is difficult to measure.

In relation to productivity, the above characteristics of the process mean that alleged improvements must be treated with some caution. What were the precise questions? What baseline of productivity were occupiers using for comparison purposes? And of course, what other changes took place in the transformation from old to new working environment that could have impacted on self-perceived or measured changes in productivity?

So...

...the POE as a measurement and management tool has great potential subject to greater consistency in its application and more emphasis on 'before and after' evaluations.

Chapter 12: Conclusions

Whether we like it or not, the office as we know it today is going to be with us for many decades. What we do in the office will evolve but the fundamentals of the office will remain – it will be a place to interact, to process information, to think and to create outputs in the form of words, numbers and ideas.

Design of buildings, both internally and externally, will become more efficient and the ICT infrastructure forming the backbone of a building will similarly support greater efficiency.

We have a duty in parallel to expand our capabilities and extend the way we measure performance of buildings and their occupants. Traditional performance measures must embrace concepts of effectiveness and productivity.

But the subject of workplace design and productivity is difficult to grasp for several reasons

- the term workplace will become less easily defined;
- there is no consistent understanding of the term productivity and how it can be measured, putting aside the difficulties in measuring it within some organisations and
- there is a recognition that the workplace is part of a wider organisational system that includes its people, purpose, processes and culture.

These challenges must be met head on in the face of:

- very powerful economic arguments about the 'worth' of a productive workforce;
- a vast body of evidence linking attributes of the workplace to enhanced satisfaction or productivity; and
- an expectation that knowledge work will come to dominate the office landscape.

The Holy Grail that comprises the perfect working environment leading to optimum productivity in all instances just does not exist – what is perfect for Organisation A might be entirely unsuited to Organisation B as their business needs and work processes are quite distinct. The implication of the above statement is that attention to the workplace alone and its design is insufficient to maximise the productivity of the workforce.

The research carried out to prepare this has, however, allowed a number of simple but significant conclusions to be drawn.

Conclusions

The conclusions are grouped in line with the broad structure of the full report.

Chapter 2: Productivity and workplace design

- productivity in the workplace is becoming quite common currency as a concept, at least a means of exchange that is accepted by many.
- to date, there isn't a formula to ensure the particular workplace design that guarantees optimum productivity – and quite rightly so. The age of determinism has passed. We must now ask ourselves what occupiers need for their business, rather than expecting organisations to fit into the text book model of space.

Chapter 3: The evolution of the office and management thinking

- early proponents of efficient design failed to consider fully the impact of their actions on the effectiveness of occupiers – this lack of insight can be visible today.
- paying attention to the needs of the occupier, and giving people and teams a degree of control over their means of organising work are factors that appear to be positively correlated to the output and attitude of occupiers.
- office design, in common with the design of other commodities, has been a victim of fashion – yet, organisational psychology has always taught us that we should cater for the inner needs of the individual.

Chapter 4: The language barrier

- the property industry is fascinated by quantifiable targets, objectives, performance measures and benchmarks – and this fascination has parallels with operational and financial business managers. Indeed, this fascination with quantifiable data is often driven by the finance community. Is the perennial pruning of costs a natural and reasonable reaction to calls for improvement in performance? Perhaps so in the absence of a robust and consistent understanding of organisational and personal productivity in the workplace. The real estate industry in its widest sense, working with the business community, must help promote a systematic and consistent approach to assessing productivity in the workplace, and develop then promote a defensible approach to quantifying the benefits of enhanced productivity.

Conclusions

Chapter 5: The economic argument

- the economic case to enhance productivity in the workplace is easily made – however, there is no standardised methodology to measure productivity and feed the inputs into business cases to support investment in new and improved working environments. On the other hand, an economic case to reduce property-related costs without due regard to the human and, therefore, business consequences may be fundamentally flawed.

Chapter 6: Health and well-being

- sickness in the workplace and its resultant absenteeism represents a huge cost to the economy, and the working environment is a significant contributory factor in the make-up of the obscene cost of low productivity. Communities with a stake in business improvement need to work more closely – these include HR, property, FM and interior design. More communities must also be measured by the impact they have on, or the contribution they make towards, the business objectives of the occupier or other relevant organisational objectives.

Chapter 7: Measurement of productivity

- self assessment of satisfaction with one's working environment is often regarded as an adequate reflection of one's productivity. It is also necessary to appreciate the myriad of drivers that can bring about enhanced productivity, and understand those drivers that inhibit productivity if allowed to. For example, there is an increased likelihood of the workplace impacting positively on the productivity of its occupiers if it displays the following characteristics or key success factors (listed in no particular order):
 - controllability of immediate environment;
 - maximum daylight;
 - few visual distractions (when distraction-free working is required);
 - lighting appropriate to the task;
 - blend of work settings that reflect business needs;
 - flexibility of design and infrastructure to accommodate change;
 - good internal air quality;
 - spaces for social interaction, relaxation and 'psychological restoration';
 - opportunities for learning and information sharing;
 - creation of a sense of place and social equity; and
 - managed by a customer-focused facilities management function.

Chapter 8: Management of change

- the effective management of change must become integral to the implementation of strategic property projects involving relocation, rationalisation of even the refurbishment of space where a new working environment is created.

Chapter 9: Drivers of increased productivity

- research has shown that many aspects of the office environment have an impact, positive or negative, on the productivity of occupiers. These go beyond the purely physical dimension of the workplace thereby reinforcing the findings of Mayo and other organisational psychologists 80 years ago.

Chapter 10: Sustainability

- the concept of the Sustainable Workforce is introduced as a holistic concept that sees the design of the workplace as but one of the links in a chain of necessarily interconnected events. The report also challenges those pursuing efficiency to do so with an eye to effectiveness in the search for the Sustainable Workforce.

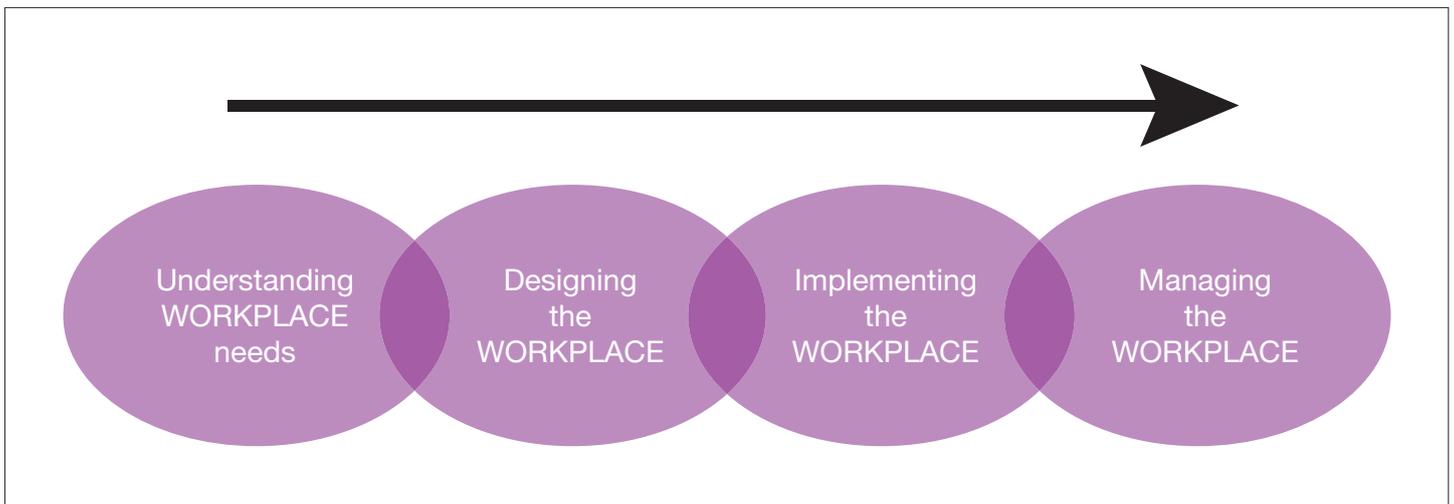
Conclusions

Chapter 11: Design for occupancy

- workplace design should not be divorced from the subsequent management of the workplace. A high quality design may be let down by ineffective facilities management, and the designers are blamed for creating the 'wrong' working environment. A mediocre or poor design may, on the other hand, be counter-balanced by a highly effective, customer-focused facilities management regime. The argument for integrated thinking among the professions is easy to make but how often are the designers, property advisors and facilities managers on the 'same page'? To promote integrated thinking, a consistent methodology for assessing the impact of workplace change, through Post Occupancy Evaluations for example, is overdue.
- the design and provision of the workplace should be viewed as links in a chain of events that can, in concert, act together to impact positively on productivity. The occupiers have a role to play and views to express throughout all the links –

and the same is true whether a bespoke building is being provided or an 'off the shelf' existing building is to be adapted and fitted out. Occupiers also need to be 'trained' in how to use their building effectively.

- greater use should be made of long term studies to track organisations going through relevant change (relocation, rationalisation or the upgrade of accommodation) to monitor the impact over time of the new working environment on productivity. Through the use of such long term studies, there is a greater opportunity to identify and 'factor out' those other aspects of work that impact on productivity but which are unrelated to the working environment – such as management policies, remuneration or the nature of the work itself.



Some of the ideas raised in this research report should now be taken forward with the hope of raising productivity onto the agenda of all businesses, and recognising that the office environment is there to help or hinder organisations in achieving their objectives.

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Where to go for further information

Property in the Economy: workplace design and productivity – are they inextricably linked? by Brian Thompson is available for downloading from www.rics.org. For further information contact Rosemary Elder, Professional Practice Manager, RICS Faculties and Forums, **+44 (0) 207 695 1597**, relder@rics.org

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RICS HQ

12 Great George Street
Parliament Square
London SW1P 3AD
United Kingdom

T +44 (0)870 333 1600
F +44 (0)20 7 334 3811
contactrics@rics.org
www.rics.org

RICS Americas

The Lincoln Building
60 East 42nd Street
Suite 2918
New York, NY 10165
USA

T + 1 212 847 7400
F + 1 212 847 7401
ricsamericas@rics.org

RICS Oceania

Suite 2, Level 16
1 Castlereagh Street
Sydney
NSW 2000
Australia

T +61 2 9216 2333
F +61 2 9232 5591
ricsoceania@rics.org

RICS Europe

Rue Ducale 67
1000 Brussels
Belgium

T +32 2 733 10 19
F +32 2 742 97 48
ricseurope@rics.org

RICS Asia Pacific

Suite 2104, Central Plaza
18 Harbour Road
Wanchai
Hong Kong

T +852 2537 7117
F +852 2537 2756
ricsasiapacific@rics.org

RICS Middle East

Office F07, Block 11
Dubai Knowledge Village
Dubai
United Arab Emirates

T +971 4 375 3074
F +971 4 427 2498
ricsmiddleeast@rics.org

RICS Africa

PO Box 3400
Witkoppen
South Africa 2068

T +27 (0) 11 467 7545
F 086 514 0655
M +27 (0) 83 288 6998
ricsafrica@rics.org



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