



The Workplace and it's Impact on Productivity

Advanced Working Papers -
A series of thought provoking insights
into work and the workplace



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To mark the 10th anniversary of the formation of Advanced Workplace Associates (AWA), we are publishing a series of twelve Advanced Working Papers, one each month throughout 2002.

The papers, written by leading experts within AWA's senior team, discuss the changing nature of work, the workplace and workplace management. They are designed to challenge traditional thinking, stimulate new ideas and promote a debate about the future of the workplace amongst senior business professionals. The titles of the papers are:

- 1 The History of Work and Where to Next?**
- 2 The Advanced Organisation - New Models for Turbulent Times**
- 3 The Workplace and its Impact on Professional Productivity**
- 4 Alternative Business Infrastructures - Planning for *Business As Usual* in the New World**
- 5 The Advanced Workspace Portfolio**
- 6 True Global Partnering**
- 7 Making Change Happen - Dream or Reality?**
- 8 Developing Business Support Functions for the Advanced Organisation**
- 9 Offshore Transaction Support Centres**
- 10 Advanced Technologies for Advanced Organisations**
- 11 How Can Change Projects Survive Change?**
- 12 Advanced Working - Scenarios for the Next 10 years**

The papers are not an end in themselves - they are merely the beginning of an ongoing debate. To continue the debate and enable contributions from a wide range of senior business professionals, we will be running a series of events throughout 2002 linked to topics within the Advanced Working Papers.

In addition, our 10th anniversary web site www.awa10.com will be host to a number of on-line forums which will allow senior business professionals to exchange views, knowledge and information, as well as to seek advice and guidance from those in our community, the authors of the papers and other experts in their fields.



The Workplace and its Impact on Productivity

The productivity of those who work in office environments is becoming a matter of greater focus for all enterprises. Productivity is comparatively easy to understand and measure in a manufacturing economy, but as our economies have migrated from manufacturing to service and on to knowledge-based, so the whole issue of assessing productivity has become less clear.

Traditionally *the office* has been a fairly bland place in which people work doing all their tasks anchored to *their own* desk. The design of the office has frequently been more about aesthetics and accommodating as many people as possible. The impact that the workplace has on professional productivity is often a secondary consideration or in some cases not even considered at all. Contrast this with the approach taken to designing a manufacturing plant where detailed consideration would be given to the processes to be performed within the building, before then designing back from these to get the best fit.

In this paper we explore the impact the workplace has on professional productivity in an office environment, based on extensive research undertaken by AWA in 2001. We will look at the role the workplace has to play in the productivity of office workers and put forward some new thinking about the role it could play in enabling everyone to perform at their optimum.

From Manufacturing to Knowledge-Based Economy

We discussed in Paper 1¹ the way in which our economy has shifted from manufacturing to a service and knowledge economy, and in so doing how the nature of work for many people has changed. People working in factories generally do so within well-defined processes embedded within large items of manufacturing plant. People know precisely what their role is. Similarly in call centres or service centres people deploy their expertise within well-defined and often automated processes.

But knowledge work is very different. It is a haphazard affair where work is loaded onto individuals from a variety of sources (boss, peers, own staff, own interest, HR department, finance department and so on). The nature of the work may constitute a number of projects with different phases involving research, data collection, data analysis and interpretation, team presentations, team working, influencing and communication. Additionally, managerial functions involve further tasks including relationship development, networking, performance monitoring and financial control, amongst others.

With the migration to knowledge work, the effectiveness of people in undertaking their tasks ought to be amongst the top things an organisation should concern itself with - or so you might think! Consequently, it would be logical to assume that organisations would put a high priority on ensuring that their people could operate at their most effective level all the time. In fact it would be reasonable to expect that knowledge-based businesses would place as much attention on creating highly effective conditions to support their people in performing various work processes, as a manufacturing business would in making sure that the design and layout of a production facility enabled maximum productivity.

So why is it then that organisations seem to pay so little attention to matching the activities that people perform in the workplace to the environments they provide to

¹ AWA Advanced Working Paper 1 - *The History of Work and Where To Next?*



support those tasks. Somehow they cannot seem to make the link between the workplaces they provide and their impact on the productivity of their people? Maybe it's because organisations cannot see the effect the workplace has on productivity because they do not capture information about the time it takes individuals to complete their various tasks? They do not evaluate how long things will take hence there is no means of measuring the variance between the estimated time for a task and the actual time taken. Compare this with a production line or a call centre where everything is measured, and hence lost productivity can be easily spotted and addressed.

The implications of this situation are severe. Let us take a typical example from everyday business life. The Finance Director of a large company decrees that the business needs to reduce its space costs by 25%. To achieve this aim some buildings are closed and people relocated to existing buildings that are already occupied by operational staff. To accommodate the additional users, occupancy densities are increased, meeting rooms, quiet spaces, social spaces are converted to workplace space, maintenance and services are cut back. The consequences are often all too apparent as they drive down morale and in our view risk the productivity of the staff in the office. But as personal productivity is not measured in any tangible way, any reduction in productivity remains unseen.

Parallel this with a Finance Director who decides it is a good idea to close one manufacturing plant to save money and squeeze everything into an existing plant alongside another line which then causes production failures. Such an action would not be tolerated because its detrimental impact on business performance is highly measurable.

Measuring Productivity

As the old dictum goes - *what gets measured gets managed!* The effect on the cost-base of adding an extra building, is readily apparent. The allocation of workspace per person can be calculated easily when workplace densities are increased. What no-one has managed to do yet is to describe in numerical or financial terms the lost productivity (individual or team) that results from failing to provide people with workplaces that support them in the tasks they conduct. What is needed therefore, is to find a way of determining the consequences, in terms of the loss of productive time, emanating from a mismatch between the tasks that people carry out and the workplaces they need to perform those tasks effectively.

In 2001 AWA undertook major research for one of our long-standing clients which examined the impact of the workplace on professional productivity. This included an extensive literature search to find definitive research into the links between the workplace and professional productivity. Material from the different worlds associated with work and the workplace, including psychology, architecture, facilities management and ergonomics, was reviewed. Academic research as well as sponsored research in the public domain was explored - a list of key texts is provided at the end of this paper.

From research of the investigations conducted over the past 70 years there can be little doubt that the physical environment has an impact upon the productivity of people in the workplace. However it is abundantly apparent that it has proven exceptionally difficult to quantify the *impact*, largely due to the composite effect and the complexity around the relationship between the physical workplace and other influences on productivity such as morale, motivation and management, as illustrated in Figure 1. It is these complex and interacting elements that impact upon the ability of individuals

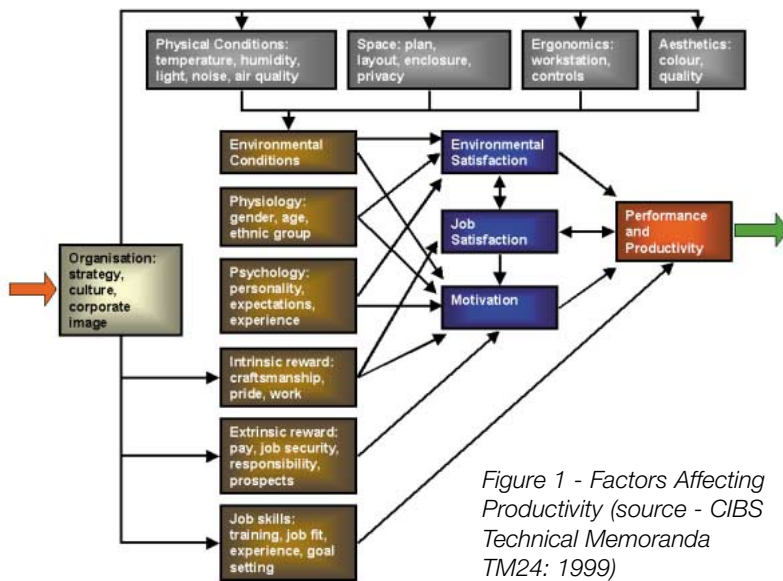


Figure 1 - Factors Affecting Productivity (source - CIBS Technical Memoranda TM24: 1999)

to perform their role to their best. With this in mind our investigations focused on the factors relating to the physical aspects of the workplace and their impact on professional productivity.

Distraction at Work

Distraction can be defined as - anything that takes attention away from the task to be performed. Distraction emanates from unexpected stimuli, which can take the form of noise, visual disturbance (e.g. glare or movement) or being too hot or too cold. It can also stem from the failure of services and systems (e.g. equipment or networks) that inhibit tasks from being performed effectively.

The extent to which distraction impacts performance is also dependent upon other factors such as the individual's ability to concentrate, their motivation and the effectiveness of their coping strategies. Continual distraction can lead to *overload*. However when considering distraction, it is true to say - 'one man's meat is another man's poison'. What some people find distracting, others may consider an aid to concentration. For example some people find it easier to concentrate on work with the aid of background music, while for others the music would be a significant source of distraction.

Work Flow

In their book 'Peopleware: Productive Projects and Teams', Tom DeMarco and Timothy Lister describe what they call the concept of *flow*. They assert that where an individual undertakes a task that needs concentration, to reach a state of concentration in which they are fully effective requires a 15 minute ramp-up time. In other words, if you sit down to write or read a report it takes you 15 minutes or so to get to a state of deep concentration in which you are going to be at your most effective - a state of *flow*.

DeMarco and Lister's theory is that when an individual is in a state of *flow* and they are then distracted causing them to be taken out of a state of *flow*, it will take a further 15 minutes immersion to ramp-up again to their most effective level of concentration as illustrated in Figure 2.

It is an interesting theory because most of us can relate to it intuitively. If you have ever tried to read a report in the middle of an open plan area in which everyone else is talking, moving about or on the telephone, you will know exactly how it feels. Similarly, when working in a quiet environment and the silence is shattered by the ringing tones of the telephone, it takes some considerable time to regain that state of deep concentration. Can you imagine if you added-up all of the *ramp-up* times caused by distraction for people in your organisation who perform professional, knowledge-based or managerial activities, how much that would be?

Further evidence that there is a significant productivity loss from distraction was identified by the Harvard Business Review, which claimed from their research that

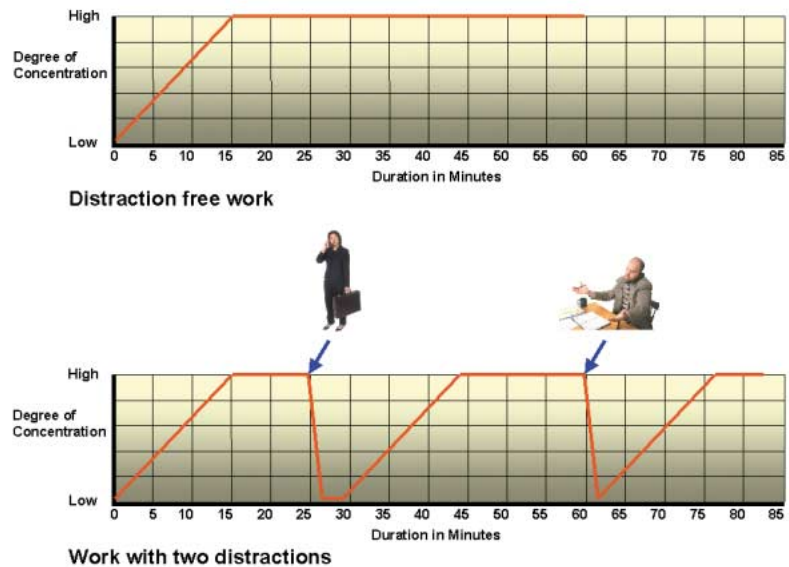


Figure 2 - Impact of Distraction
(source - Peopleware: Productive Projects and Teams, Tom DeMarco and Timothy Lister)

within a well-managed office there is approximately seventy minutes of lost productivity in a typical eight-hour day resulting from distraction due to general conversation, i.e. almost 15% of the working day. Of course not everybody in your organisation is involved in tasks that require deep concentration, nonetheless the principle still holds good, namely that anything which stops an individual performing at their best, wastes energy

“seventy minutes of productivity is lost in a typical eight-hour day as a result of distraction”

Work : Place Mismatch Leads to Productivity Losses

It is our contention that the workplace should be designed to enable people to give of their best everyday. In today's commercial climate work is tough enough without unconsciously creating conditions that people have to overcome in order to perform at their best.

It is said that a well-motivated team will work well regardless of their workplace environment. This we agree with, however it is because they are well-motivated that they overcome workplace inadequacies as illustrated in Figure 3. If people are not well-motivated their productivity might fall because they were unable to overcome work:place mismatch.

In such circumstances people expend energy overcoming the problems that exist in their work environment e.g. a faulty printer, noise from the chap that is always on the phone, or meetings in the corridor because there are not enough meeting rooms. All of these are causes of wasted time or contribute to making people less effective in performing their work, through having to overcome obstacles that should not be there in the first instance.

People are resourceful and often find *workarounds* with IT that does not operate properly, with printers that fail to function, with environments that do not support the cerebral tasks that they are trying to perform. Not only is this energy that could and

Work:place mismatch iceberg

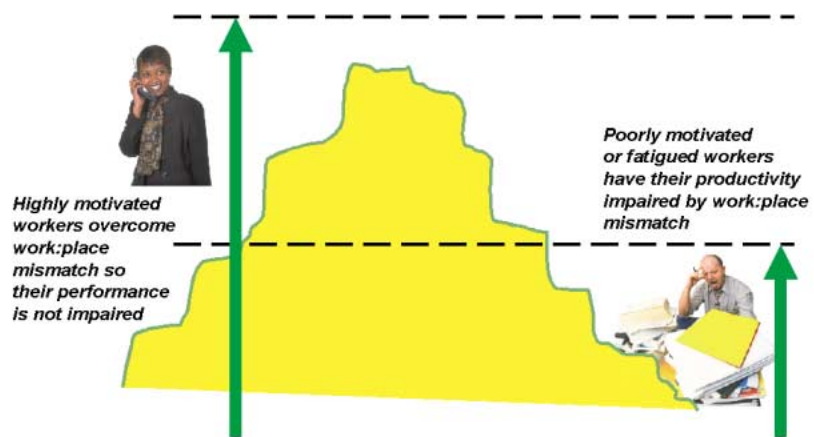


Figure 3 - Addressing Work : Place Mismatch

should be better used in pursuance of their personal best, but the fact that the organisation allows it to continue to exist says something about the extent to which the organisation *really* cares about the endeavours of it's people. What message does it give out when things continually do not work? - that the organisation does not care. When systems and equipment are forever breaking-down, and energy is constantly being expended to overcome these failures, this can and often does, contribute to fatigue, eventually leading to stress. If these failures are persistent, they send a negative message about the organisation's interest in its people, thereby lowering morale, which may also contribute to fatigue.

Fatigue is fundamentally tiredness - either physiological, psychological or both. It can be occasioned by many things including sustained overload, and can lead to low levels of arousal or interest in activity. When fatigue sets-in the performance of an individual will drop significantly until they are rested. In addition to tiredness, symptoms include irritability, difficulty in concentrating and increased error rate, further compounding productivity losses.

'Our People Are Our Most Important Asset'

Early in my career with a major UK electronics company where I worked in their software R&D operation, I recall a very hot summer. The building in which I worked had no air conditioning. One day the building became so hot that people were perspiring freely and were thoroughly distracted by the heat. People walked about, went out of the building and tried to keep cool in the best way they could. The project on which we were working was beginning to run late. People asked for a dozen electric fans to keep the air flowing and were told that the company was not prepared to provide them. At that time each of the 200 software engineers were costing £400-£500 a day. The hot period lasted about two weeks, during which I estimate that the company must have lost at least one hour of production from each person per day. This equates to 2,000 hours, 250 man-days or £112,000. I reckon the fans would at that time have cost £20 each!

Work Related Stress

Failures of the workplace, its environment and systems further contribute to stressful



situations, as anyone who has experienced such situations knows. Stress is a physiological and psychological response to a perceived threat and it causes high levels of arousal above those that support productivity. Stress if not managed effectively, can lead to ill-health. So if an individual's workload is high while their capacity is diminished by work:place mismatch, then in the worst instance they may begin to feel stressed.

Overload is a function of the imbalance between the level of work an individual has to tackle and their capacity to handle it. Alternatively, overload can arise if the individual is not competent to perform the tasks he/she is asked to perform. If tasks are taking longer than they should to perform because of lost time through distraction and other workplace related failures, then the individual's capacity is reduced leading to the increased probability of overload and attendant stress. In practice this is likely to result in the individual having to take work home or work longer hours, which may have the effect of impairing family relationships, further compounding the stress. Prolonged working is a known contributor to both productivity losses and occupational stress.

When people find themselves in these stressful situations they will often deploy what are called *coping strategies* as they attempt to mitigate the negative impact of the work environment by relying on short-term fixes.

Coping Strategies

Coping strategies are methods that assist people to focus their mental resources (attention, mental stamina, etc) upon their objectives. They are relied upon when people perceive their resources are insufficient to accommodate both work demands and the distracting interruptions of environmental stressors.

There are two coping strategies based on the principles of *flight or fight*. With approaches based on *flight* people take avoidance action either by relocating themselves physically, such as moving to a quiet room to escape noise, or mentally through relaxation and acceptance techniques seek relief or breaks from those factors causing them stress. Avoidance is the best approach, sometimes the only approach, in situations where people have no control over their environment. The second approach, based on *fight*, involves seeking to control, and actively changing the stressor, such as by altering the level of noise in the workplace. Any failed attempts to change or control an uncontrollable situation will lead to personal distress and is likely to impair individual and team performance, motivation and health in the long-term.

Lets consider again the example quoted earlier, of the organisation that decided to remove all meeting rooms, quiet spaces, and social areas whilst increasing occupancy density in order to fit more people into one of their buildings so they could close another. By increasing occupancy density they increased the risk of distraction (through closer proximity of workplaces) and probably exceeded the capacities of the building's ventilation systems and other services. So the likelihood of distraction from noise, movement, increased temperature and reduced air quality has probably increased. In response, one coping strategy would be to move to somewhere else in the building to work for a while or to have a coffee, but now because the break-out spaces have been removed, there is nowhere to go.

Providing Appropriate Environments

What all of the aspects above point to, is the need for workplaces to be designed and

managed consciously to support people in their work activities. This means providing people with a mix of environments and services geared to enabling them to give their best performance every day without wasting emotion and energy on overcoming work:place mismatch.

In Paper 5², we discuss how control of the work environment can be enabled through the provision of a range of workplace settings. However to get to this point requires examining the way individuals, teams and the organisations work, both in a physical context as well as in an information and knowledge context. This involves helping people to articulate their needs rather than solutions, which demands objective structured analysis. One member of our team once described consultants in AWA as *workitects*. Possessing the skills of workplace and building design is insufficient on its own. Creating effective environments that truly support people's work needs, demands different and additional skills, in order to get *under the skin* of the organisation to establish how it really works, so that a brief can be created which will guide designers in their delivery of great workplaces.

When open plan was introduced it was on the back of the mistaken belief that it could enhance communications, remove barriers, expose people who were under-performing as well as improving the use of space. In many organisations it was introduced without a thought for the tasks that people perform. Frequently it gave rise to situations where people who needed quiet for tasks requiring concentration, were forced to perform such tasks in the midst of an open plan work environment. Where everyone in the open plan area is also involved in similar tasks and their output or *emissions* from those tasks does not create distraction for others, then productivity can be achieved. However, if these same people were placed within an open plan environment where they are surrounded by others who are emitting noise such as from telephone calls or meetings, then productivity is likely to be impaired. In short, here the activities of adjoining workers are in conflict.

Productivity and Advanced Working

In Papers 1 and 2³ we referred to *advanced working* where people are able to work anywhere in the building, whilst still having access to all their software, data and information. In such situations workers are able to choose the environments that best suit the tasks they have to perform. Consequently the risk of work:place mismatch is minimised because people are free to move to an area that has attributes appropriate to the tasks being performed. For instance if an individual needs to work at a PC to write a report they can take their laptop to an area designated as having no audible or visual distractions. If laptops are not used, they can go and log-in to a networked PC that enables them to access their software and files. In traditional office environments people are expected to work at their own PC which has their software and files on its hard-drive, making it impossible for them to move to another environment. This is a subject we will develop in Paper 10⁴.

In Search of the Holy Grail

It is clear that measuring the effect of the workplace on productivity is a challenge, because it is very complex and there a great many factors that interact and have an influence upon each other. This complexity often gives rise to the belief that productivity cannot be measured, hence it is frequently referred to as *the search for the holy grail*. If however, you accept that work:place mismatch is likely to cause losses in productivity,

² **AWA Advanced Working Paper 5** -
The Advanced Workspace Portfolio

³ **AWA Advanced Working Paper 1** - *History of Work and Where To Next?* and **AWA Advanced Working Paper 2** - *The Advanced Organisation - New Models for Advanced Organisations*

⁴ **AWA Advanced Working Paper 10** -
Advanced Technologies for Advanced Organisations



then it is perfectly possible to measure the mismatch between the needs of work tasks and the workplace(s) provided. At AWA we have for many years been using a tool we developed called a Workplace Effectiveness Appraisal (WEA). The WEA is a web-based questionnaire for workplace users to complete, which seeks to establish the degree of matching that exists between the tasks people perform and the workplaces with which they are provided. Using this tool it is possible to measure work:place mismatch which can act as a productivity indicator, as it probes 13 factors several of which relate to distraction. While AWA have been using the WEA for many years and have a database of over 20,000 responses from office users in many of the UK's leading companies, we are keen to develop this tool further, and intend to undertake further research over the next 2 years. Our aim is to begin to quantify what different levels of mismatch mean in terms of lost productivity.

In this paper we have attempted to provide some insights into how the workplace can impact upon professional productivity, which is something most of us intuitively know. Managers who do not consider the effects that their changes to workplaces may be having on professional productivity, may look superficially as though they are doing well for their firms in terms of reducing space consumption, but in reality, they could be doing irreparable damage in terms of lowering productivity and morale. We must therefore find an effective way to quantify the fiscal impact the workplace has on individual performance so as to counterbalance the financial pressures for increasing occupant density.

In AWA we believe however, that by deploying advanced forms of working, and in so doing *unchaining* workers from their desks, that organisations can have it both ways - they can both increase occupancy levels with attendant improvements in space utilisation, while providing a range of workplaces from which people can choose the settings that help them work to the best of their ability.

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Founded in 1992, AWA is an independent, multi-disciplinary management consultancy that works with leading organisations to help them make the transformation to advanced approaches to work, the workplace and workplace management.

Our services include:

Strategic Workplace Planning - evaluating current workplace performance; identifying potential for improvement; recommending practical actions; researching new locations; quantifying opportunities for advanced workstyles and workplace models to provide best value against defined business scenarios.

Advanced Working Transformation - defining the prerequisites for advanced workstyles; identifying the dependencies for sustainable advanced working; facilitating the process of transformation in safety from traditional to advanced approaches to work, workplace and management.

Service Management Transformation - evaluating current performance (cost, utilisation, satisfaction and value) of workplace services, processes, procurement models and management; recommending practical arrangements to align services to business objectives to derive the most effective workplace experiences for people.

Workplace Management Transformation - evaluating current performance of internal service departments (facilities, real estate, HR and IT); identifying scope for improvement; facilitating the process of transformation from internal technical contributors, to effective service-led pre-eminent business contributors.





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