

Office Ergonomics: The new landscape and making use of technology to manage risks

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ABSTRACT

Until 2020, management processes designed to control the risk of musculoskeletal disorders associated with working on computer screens, were mainly based around the Display Screen Equipment assessment and guidance published by the Health and Safety Executive (HSE). This was based partly around the notion that an individual was using a dedicated workstation and one type of equipment. With the new landscape created by the COVID 19 pandemic, where people were forced to work from home in far greater numbers than previously, employers, employees, and regulators increasingly realised that sub-optimal workstations were being used, and the ergonomics challenges were presenting themselves in new ways. Once this issue became clear and the timelines for homeworking continued to stretch out, the Health and Safety Executive published updated guidance, which distinguished between temporary and longer-term homeworking. However, there was no prescriptive information given on what temporary meant. To untangle this, from a responsible duty holder point of view the fundamental question to be considered is – in the time that someone will be / is working at home, is there potential for development of musculoskeletal conditions due to poor work set-up? And if there is potential, then the risk must be managed. However, with the increase in remote working, the established model for managing the risks from DSE work needs some adaption. In the future particularly as lockdowns ease, work may be split between offices, co-working space, home and cafés / ‘on the go’ etc, duty holders may need different assessment frameworks and technological solutions to implement them.

KEYWORDS

Workplace Ergonomics, Repetitive Strain Injuries, Display Screens equipment, Audit, prevention, Technology.

Introduction

In this report, we look at how office life over many has changed dramatically, not least since early 2020. We put this in the context of the origins of the office, and progress to discuss how the ergonomics discipline may also need to adapt to this new normal, by using the opportunities offered by technology.

In 2019 homeworking was still very much a minority pursuit – surprisingly few people worked mainly at home – approximately 4.7% of ‘white collar’ workers. Then COVID-19 threw the old established office model of business up in the air, and by April 2020, the proportion of people working at home had rocketed up to 43.1% . Since then, the figure has fluctuated – but it still remains many times higher than it had been at the end of 2019 (Felstead, 2020).

A survey carried out by the Institute for Employment Studies (Bevan, et al, 2020) after just two weeks of lockdown and widescale homeworking, found that more than half of respondents reported new aches and pains – perhaps predictably in the neck, shoulders and back. These figures were also supported by a later study by Moretti et al, (2020). A survey carried out more recently by Opinium on behalf of Versus Arthritis found that nearly 90% of staff working at home who were experiencing new aches and pains had not told their employer, and nearly a quarter of respondents said they were experiencing pain most or all of the time (Webber, 2020).

Some significant change to the balance between office and homeworking looks set to become permanent for many people. The British Council for Offices found in a September 2020 Survey, that 62% of senior managers and executives want to divide their time between the home and office, as do 58% of entry level workers (Barnett, 2020). Even before the Government stepped back from trying to get people back into the office in mid-2020, only 30% of people were looking at returning 5 days per week, and 15% were intending to work fully at home, with little or no time in an office. A Joint University of Cardiff and Southampton report (Felstead & Reuschke, 2020) found that 50% of new homeworkers would like to work at home often or always – even when COVID-19 conditions allow a return to ‘normal’ working.

Senior managers appear to support this move when previously, there had been stronger opposition. In an Institute of Directors survey carried out in September 2020, 59% of respondents felt there would be less use of their organisation’s traditional ‘workplace’ in the long-term.

New workplace reality

Office and Workplace History

Where did it all begin? The history of offices can be traced back to the antiquity where they were originally part of a palace or a temple. The word itself originates from the Latin “officium” and was relating to both a place and a function, creating a relatively elaborated form of organisation. With the fall of the Roman Empire, a lighter form of organisation took place and would continue up to the middle ages, where most offices were quite often part of medieval chancery, with a dedicated role towards government activities. Those activities consisted in either Government letters being written, or laws copied in the administration of a kingdom. It wasn’t until the 15th century, when population density in many cities increased, that the merchants started to use stand-alone buildings, and organisations started to be distinguished, according to their line of business.

The 18th century, with the rise of large, complex organizations, such as the East India Company or the Royal Navy in the U.K, saw the construction of the first purpose-built offices. It was the start of a trend, which intensified with the industrial revolution, as industries such as banking, insurance, rail etc. required more administrative employees (clerks) to accommodate their dramatic growth. As such, more office space was assigned to their activities.

While the beginning of the 20th century saw the industry going through an organisational transformation with the implementation of the “time and motion approach”, elaborated by F.W.Taylor, the office world saw a similar move with the implementation of the “Modern

Efficiency Desk” in 1915. This organisational strategy had a key objective, to allow managers to view their workers without visual barriers and was used until the middle of the century. However, in the post-war era, office organisations, based on studies and feedback, went through an organisational transformation, swapping openness for privacy.

The big open plan easily supervised office was gradually abandoned, as it was found that an efficient office required discretion and control over privacy, resulting in increased productivity and creativity. On this basis, the furniture company, Herman Miller, under the lead of the Industrial designer, Robert Propst, arrived at the **Action Office concept**, which culminated with the widespread implementation of the cubicle office, and associated office furniture systems.

However, the Western and Eastern world took a different approach during the 20th century. In the East, Japanese businesses taking a more culturally aligned team-effort and individual accountability approach began to be organised in open-plan offices, leading to the disappearance of individual or cubicle offices. In order to increase productivity, each team was (and in many cases still is) organised in desk islands, with the senior manager at the head of the island and team members in easy sight. This is an office arrangement model that persists today, although it is less favoured in the West.

In the 1980s, with the start of the Globalisation, multinationals were able to look at how different countries were designing and organising their offices, and this resulted in new strategies being taken by the beginning of the 21st century – the main change across that period having been a shift from individual offices and cubicles to open-plan working arrangements.

The making of the modern workplace (21st century)

The late 90s and the early 2000s saw a major transformation in our society - the growth of Internet access and usage. This major change, which some have dubbed “the 3rd industrial revolution” has (and continues to) impact our societies beyond what people would have imagined. For businesses, the widespread use of internet, changed the way people, communicated, or even performed their activities, enabling multi-location collaboration.

Another major change has been the gradual erosion of the distinction between private and personal life, as many people now intensively use web-based technology in both areas of their life. This trend has accelerated since the late 2000’s and supported the appearance of Tablets, Smartphones, and Cloud computing which again helped in part individuals to perform their work activities in a far broader range of locations.

Prior to COVID homeworking, as a result of widespread use of new technology, and new cultural approaches to office organisation, we saw over the last 10 years, new concepts in office organisation, called variously Smartworking, Agile working, Activity Based Working (ABW) etc. ABW specifically was first described by the architect Robert Luchetti, who thought that it was possible to adapt office settings to work activities, in order to increase creativity and productivity. The concept was then described in the book “The Art of Working” (Veldhoen, 2004) but was first implemented in the Interpolis office, one of the largest insurance company in the Netherlands, in the 1990s.

Over the recent years, another trend, or reason, to adopt “Activity Based Working” was the desire for companies to streamline their organisation efficiency, as well as their structural

costs. Downsizing offices, with their incompressible costs intrinsically connected to their size and location, was and still is often seen as an easy way to save an organisation money, while allowing employees more flexible work patterns that ostensibly supported their wellbeing and work-life balance.

While those movements were still marginal though being considered to varying degrees up until the end of 2019 (<5% in the UK working at home prior to COVID), the COVID-19 Pandemic and subsequent lockdowns across the globe led to rapid adoption of Working from Home (WFH) as a business continuity and COVID risk control measure. This has inevitably led many companies to question their current strategical organisation, especially their physical infrastructure requirements.

Returning to the circumstances of 2020 and beyond, there is little doubt that technical and cultural change has been a key factor in enabling employees to work from home during the current pandemic and has facilitated vital business continuity. Over the final quarter of 2020, we saw some organisations pushing forward with nearly 100% working from home, while others are still keen to go back to 9-5 days in the office, 5 days per week. Others are bridging the gap with a mix of home and office working – but including significantly more home working than pre-COVID.

When considering:

- The ongoing and unknown long-term impact of the pandemic on the economy - meaning companies in a range of sectors are likely to be looking for structural cost reductions.
- The desire for people to rebalance their work-life balance allowing them to spend more time at home and less time commuting – which is ultimately likely to be a driver in company policy if they are looking to recruit and retain dynamic workforces.

there seems little doubt that for many people the end-result is likely to be a halfway arrangement - Hybrid work, a mix between WFH and Office work, becoming the norm. What is also clear, is that to survive, the office will have to reinvent itself as a place you want to go as much as a place you have to go.

How can technology help businesses stay compliant?

A move towards the new office reality:

Until recently, the Health and Safety Executive (HSE) guidance was designed primarily for a traditional office, and a traditional way of working. An approach easily summarised under the following: 1 individual, 1 desk, 1 location.

Despite the rise of new technologies, the HSE DSE guidance, due to the unchanging legislation, did not focus to the same degree on the risk management of people spending substantially more time working on a laptop, tablet or a smartphone than a desktop. In 2019, The HSE noted the impact of mobile working and its potential risks by recognising the guide published by the CIEHF, Mobile Working Risk Management System.

In practical terms, many businesses continued to broadly consider their employees' set-up outside the office as something that they had little or no responsibility for. This may partly be due to uncertainty over the law and their duty of care. With the pandemic, and the

unprecedented adoption of homeworking on a prolonged (and potentially long-term) basis, the HSE states that there is a clear need to consider those alternative offices set-ups and has recently updated its regulatory guidelines online. The DSE regulations themselves, which state that an employee should be informed, trained and their workstations assessed remain unchanged and provide a basic overview of the duty of care that employers have.

As a result, HSE guidance now states that employers should consider whether someone can work safely (which will include musculoskeletal and mental health aspects) at home and whether they need control measures in place (i.e., equipment as provided in an office environment). Importantly, the HSE state this applies to either permanent or temporary home working. But the question remains: How can companies achieve this effectively?

How to use the disrupting impact of technology to prevent Musculoskeletal issues and Mental Health issues in an ever-changing world?

In the workplace and the Facilities Management, HR and Health and Safety world, there have been software solutions and user self-assessments rolled out to help organisations manage the risks associated with DSE activities, but the scope of these in terms of homeworking and agile working has in some cases been more limited – possibly held back by the inertia towards embracing homeworking as a real long-term option.

At the same time, over the last few years have seen the arrival of a new approach from FM and/or H&S professionals with different views on how offices are utilised, and how they can be improved by adopting a vision that the office should be run like a hotel. Their modern view is that as a service, employees should be able to book a desk, report a faulty I.T or book multiple services such as their meeting rooms, an appointment with the I.T service, their car park places or even select particular desks in an open space.

To summarise, this approach is based on the idea that employees are to some extent customers of the business, and it is described in detail in the book, *The Elemental Workplace: The 12 Elements for Creating a Fantastic Workplace for Everyone* (Usher, 2018)

However, there is inertia in the system, and when it comes to managing the Musculoskeletal issues, the approach is still often the following.

- Provide employees with generic training,
- Issue a generic self-assessment questionnaire,
- Address the red flags, quite often represented by employees with (pre) existing conditions, and/or people who have understood that their equipment is faulty and needs to be changed.

This approach could be summed up using the following words: Reactive, a Tick the box exercise, Generic. What has been exposed by the rush to homeworking is that we are now in a more varied work-world, where the musculoskeletal risks may be increased by individuals' needs to do prolonged work in more than one DSE set-up / location – one or more of which is less likely to be optimised. The approach taken to track and address risks in all DSE work situations will be more reliant on technology and a revised method.

So how can a business, in this 'new normal' achieve the following key goals?

- Compliance with the relevant H&S regulations and avoidance of civil claims
- Establishing pro-active support of their employees' mental and physical conditions.

A monitoring approach:

Over the last few years, a range of applications with the goal of promoting employees' wellbeing (and/or productivity) have been developed. All those applications share a common approach, based on the monitoring of a specific issue for an employee, which now also includes productivity, with a view of understanding if each individual is doing enough or not. Monitored by these apps an individual will be able to pace themselves against a goal and ensure the goal is either achieved or exceeded.

Below is a list of examples of goals, for which applications have been developed:

- Employee engagement and productivity such as Workpuls, Activtrak...
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Through this approach the manager will be able to monitor what employees are doing while being at work. This monitoring takes the form of software-usage time-tracking, automated screen shots, an employee picture through the webcam. A growing concern is that it is easy to view this "big brother" approach as not built on trust, but on a desire for control.

The emergence of such features in offerings of big software companies (e.g., Microsoft through Teams) could potentially strengthen this feeling.

- Employee wellbeing, such as Activ 8, My fitness pal stairs case challenge, Apple Health...

Dedicated to physical well-being, all these apps allow the individual to take part in a physical challenge, alongside their colleagues. While possibly good for the morale and the general fitness of the workforce, those solutions, like the previous ones, are not a legal requirement and therefore continue as a 'nice-to-have'. In addition, not every employee will be willing to participate in any given challenges and there are potential ethical and privacy hurdles to overcome.

- Sit-stand desk use, such as the Work and Move app

This application, dedicated to monitoring an individual's posture while at their workstation, will act like an alarm clock by telling the end-user when he should sit or stand, takes break, and reward the employee, by awarding him trophies, cups and compliments in his personal profile, for adopting a healthy behaviour.

What is the common point between all those examples?

The common feature present is that all results obtained are being fed to the end-user, i.e., the employee, in the first instance, but ultimately, are being passed to the management.

As a result, there is a risk, real or perceived, that those tools will be perceived only as monitoring tools, (the famous Big Brother effect), resulting in a risk of rejection, and ultimately, a lack of engagement from the employee. They also – whilst initially seeming attractive – risk being a distraction from addressing the key duties of care relating to computer use, unless they form part of a well-structured wellbeing policy.

What an ideal solution may look like

To achieve the two key goals of compliance and supporting employee wellbeing, we believe the ideal approach should be built on the following pillars:

- Human-Centred, by putting the end user and their personal work circumstances at the centre of the training and assessment process.
- Tailor-made training and guidance - based on the actual elements or characteristics of the Workstation and Environment regardless of what they may be and where – considering the wide range of situations and equipment / furniture being used.
- Information Accessibility - ensuring all relevant workstation support and equipment information is easily accessible and regularly updated.
- Easy Reporting - enabling employees to report any information to relevant departments or individuals, through a straightforward and transparent process.
- Easy and regular review - allowing employers to test, audit and trace employees' issues on a regular basis.

As many employers (large ones in particular) have found, carrying out this audit work face to face (which includes by video call), whilst ideal in a number of ways, is potentially time-consuming, difficulty to arrange from a logistical perspective, and potentially delays the distinction between standard and higher priority cases.

These issues can already be a challenge in a 'typical' large office environment, and with the rise of WFH, in some cases the near doubling of the work set-ups being assessed and advised on, and the signs of increased musculoskeletal issues, there is a pressing need for solutions.

One path that will be logical for many employers will be to look to use technology-based solutions. This could take a form in which all key risk management functions are grouped in an app, through which employers can empower their employees:

- Enabling them to receive immediate advice on their work set up, regardless of the environment they are in
- Turning employees into more active managers of their own wellbeing in the workplace.

In our view, this approach when optimised will still enabling employers to base their Wellbeing strategy around legal duties of care (the basis of workers' Health and Safety) and may also (ideally?) allow measurement of success of Wellbeing strategies and initiatives in terms of their return on investment.

Earlier in this piece, we noted the "I.T concierge service" concept, and this provides a useful model of how Workplace ergonomics can be effectively organised, allowing people to customise their assessed and advised-on workplace within their personal training and assessment process.

By using this approach, which brings together H.R, H&S, and F.M functions, both businesses and employees stand to create a mutual trust, in which the following benefits would be visible:

- For employers
 - o An ability to offer a more tailored wellbeing and risk management process – benefiting inclusivity and supporting staff.

- Reduced staff turnover and sickness absence
- An enhanced model for preventing musculoskeletal disorders and supporting employee's mental health.
- Reduced litigation costs.
- For employees
 - Reduced likelihood of their work having a negative impact on them physically as well as mentally.

Conclusions

Office work evolved over a long period of time. Organisations in many cases remained resistant in recent years to continued evolution, towards homeworking. However, in 2020 COVID-19 made change unavoidable, and homeworking is the new reality for a large proportion of the workforce.

Organisations understandably are still wrestling with what this means in terms of how they manage the musculoskeletal and mental health risks, however the HSE is now clear, that the DSE Health and Safety issues for homeworkers do need to be addressed and managed. The question remains though what form that takes and ultimately how effective it will be.

The COVID 19 pandemic has accelerated the move towards prolonged or in many cases permanent homeworking. While there will always be a place for face-to-face or video assessments for individuals who have specific or complex issues, it seems logical, unavoidable even, that technology will be used more widely now as an enabler to improve ergonomics for staff, wherever they are working. However, the technology or apps will need to catch up with, or be designed around the new reality of homeworking, combined homeworking and office working, and other types of remote working. It is also likely that they will look – if they have not already – to integrate additional wellbeing, and possibly productivity functions, alongside the DSE aspects and a model which integrates these into dynamic user accounts may be the most coherent solution.

Businesses will also need to come to terms with the fact that many staff when working at home still, after nearly a year, work in compromised and sub-optimal arrangements, and that employers have a duty of care to make sure their employees' situations are safe from the point of view of musculoskeletal risk 'as far as is reasonably practicable'. The Versus Arthritis survey mentioned at the top of this report found a reluctance in staff to raise issues with managers – possibly because of concerns over job security or concern about being asked to come back into the office. The same survey also worryingly found that between a third and 45% had received no equipment support or advice from their employer on homeworking. In the authors' view this is a situation that needs to be addressed with urgency. Musculoskeletal conditions can become severe relatively quickly, and if not addressed can become chronic which significantly increases recovery times, the likelihood of staff taking time off sick and associated impacts on mental health.

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- ActivTrak: Workforce Analytics & Productivity
- Microsoft teams: [User activity report](#)
- Activ8: Sitting is killing you! Activ8 monitors sitting behavior - Activ8 (activ8all.com)
- Bakker Elkhuisen: Work & Move app.