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Whitepaper

The worth of workplace well-being

# Introduction

Have you noticed how the notion of personal well-being has crept into every corner of our everyday lives in recent years? From what we eat to what we wear and how we work, we're increasingly encouraged to make decisions that will improve our physical and mental well-being. And it is not enough to embrace wellness in a general sense: we can now measure every step, every calorie, and every minute of sleep to get validation of just how healthy we are.

The need to quantify ourselves has migrated into our apparel, our smart phones, and even our home appliances. We have become "everyday athletes" hooked on technology to track every health-conscious move we make—and this does not stop at the office reception.

Everyday life and work-life are merging more and more, which means the office now must cater for the emergence of a more health-conscious workforce—a shift that demands more investment from an organization but that can also bring significant benefits. The work environment plays a big role in both the physical and mental well-being of employees. It can influence how people think, feel, and behave on a day-to-day basis, so why are so many workplaces still geared towards the old industrial goal of efficiency and not to the 21st century productivity raiser, well-being?



# The business case for well-being

Most companies are familiar with the 3:30:300 principle that calculates, on average, how much is spent per square foot per year in an organization. Typically, this equates to US\$3 spent on utilities, US\$30 on rent and US\$300 on employee salaries. This shows that companies can make their most significant cost savings through people and not the building infrastructure, which is where most companies try to save.

Productivity levels, especially in the UK, have suffered in the decade since the 2008 global financial crash, forcing organizations to re-evaluate how their employees work to yield the best performance. A big part of this re-evaluation is now focused on well-being. Employees who have good mental and physical well-being are more satisfied, which can result in better overall performance. Well-being initiatives can therefore have significant cost saving potential for an organization. The downside, however, is that productivity is notoriously difficult to measure and not everyone is willing to jump on the well-being bandwagon so readily.

In many cases organizations considering well-being measures face tough budgetary scrutiny. However, as more evidence in favor of mental and physical well-being become available, attitudes are changing, and companies are realizing that well-being can have real, tangible outcomes for the business.



## Optimizing environments

In the name of employee well-being, organizations have looked at signing up to international standards such as WELL and FITWELL to improve the office environment. The WELL Standard has seven themes related to fundamental human requirements, from light, water, air, and comfort to nourishment, fitness, and mind. Thanks to a growing evidence base, more is understood about the relationship between the physical environment and health than ever before.

Environmental monitoring in offices creates spaces that help, rather than hinder, employee health and well-being. Organizations can now measure—and improve on—the environment they provide for their workforce in terms of air quality, water, light, and temperature. This allows companies to design and orchestrate environments which actively promote healthy lifestyles and inspire employees to do their best work.

Putting metrics on the environment can significantly help to put a business case forward for well-being—but, even with new science and more monitoring in the field, fierce debates about the optimum environment for work still rage.





## Temperature

Take the thorny issue of office temperature, which is one of the biggest sources of employee discomfort. It is scientifically proven that men and women have different temperature thresholds making it nearly impossible to please everyone: one person's "too hot" is another's "too cold." However, evidence now indicates that the optimal air temperature for best cognitive performance is 68–74 °F, with a humidity level between 40 and 70 percent.

Despite the science, there is still a large amount of variation between how individuals feel in certain temperatures. Subjective preferences, therefore, tend to be a more reliable predictor of performance than the objective temperature. This means that individuals perform better when they have control over the temperature they work in, so they can choose an optimal temperature to suit their needs. The preferences of occupants change throughout the working day, so offering thermal control is likely to increase user comfort and satisfaction.

Temperature also can affect people's agreeability. Evidence shows that individuals are more likely to go along with other people's opinions when they are comfortably warm rather than comfortably cool. In addition, people are more likely to make more emotion-based decisions in colder temperatures and more cognitive-based decisions in warmer temperatures. Scientific evidence, however, demonstrates that people make riskier decisions when the ambient temperature conditions are too warm. High ambient temperatures should, therefore, be monitored in office environments to prevent impairments in decision making.



## Air quality

It isn't just uncomfortable air temperature that irks employees. Poor air quality also prompts many complaints. As a significant dampener of productivity, poor air quality is often disregarded as a secondary concern in the office. Many organizations, for example, do not realize the impact of high levels of CO<sub>2</sub>, even though it has now been proven beyond any reasonable doubt that poor indoor air quality in buildings can decrease productivity and cause dissatisfaction, with research showing that the total impact on work performance can be as high as six to nine percent.

Poor indoor air quality is more common than we may think. According to the United States Environmental Protection Agency (EPA), the levels of indoor air pollutants are often two to five times higher than outdoor levels—even in busy cities. So while we may try to avoid inhaling the fumes from taxis, buses, and various other pollutants on the street outside, the office interior could actually be much worse for our health.

Solutions that improve the quality of air in office buildings through better ventilation and lowering pollutant levels can help. Performance of typical office tasks improves with an increased ventilation rate and fewer indoor pollutants, such as volatile organic compounds typically found in materials used in conventional workplace buildings. An average increase of 60 percent in scores in decision-making performance have been seen in greener office buildings where there are low sources of volatile organic compounds.

Although it's only one source of poor air quality, high CO<sub>2</sub> levels in the workplace can impair how an employee thinks, reasons, and remembers. Long meetings in small meeting rooms can become tiresome, but the reason that everyone's eyes are closing is more likely because the levels of CO<sub>2</sub> have risen and there is no longer enough oxygen in the room to keep people alert. Smart systems are now available that monitor air quality in meeting rooms with sensors, then use algorithms to prompt the HVAC systems to inject more oxygen into the room when the CO<sub>2</sub> level rises too high.

Perception of air quality also has an impact on performance. If employees perceive the air quality as good, they are more likely to perform better. Organizations should therefore try to create positive perceptions of air quality in the workplace by promoting their efforts to keep the environment fresh and free of pollutants.



## Acoustics

Research repeatedly shows that the lack of acoustic privacy is the biggest aggravator in the workplace. Acoustics in open workspaces can be difficult to control, and this can be incredibly stressful for employees.

Research shows that mental disruption does not only stem from very loud environments, but also particularly quiet ones. Both very loud and silent office environments can cause a negative effect on factors such as task performance, satisfaction and well-being. Too much noise is obviously very disruptive for concentrating, but too little also poses a threat. According to Acun and Yilmazer—professors in Ankara, Turkey—when spaces seem too quiet, workers become worried about their individual privacy and feel exposed in the workplace.

Acoustic issues are often dictated by office design. In recent years, open-plan offices have become a go-to solution for businesses seeking to improve teamwork while reducing real estate costs, but there is now growing evidence that this sometimes comes at the expense of employee satisfaction. According to a paper by Harvard's Ethan Bernstein and Stephen Turban entitled "The Impact of the 'Open' Workspace on Human Collaboration," open-plan offices—designed to promote serendipitous interactions and increase communication—actually decrease face-to-face interactions in the office.

In their study, Bernstein and Turban looked at communication patterns of employees inside two large corporate organizations making the shift from cubicles to open plan. Using sociometric badges with sensor technology, they collected accurate data on what human interaction took place, where, and with whom over two periods—for three weeks before the change to open plan, and for three weeks some three months after the switch. They also collected all email and instant messaging traffic over these same two periods.

Bernstein and Turban discovered that the volume of face-to-face interaction fell by around 70 percent, with a corresponding increase in electronic interaction. When people were placed in vast spaces with no escape to quiet areas, they felt their privacy was compromised and, as a result, they withdrew from colleagues and instead interacted over email and instant messaging.

Design plays an important role in the acoustic satisfaction of employees. Evidence shows that there is a correlation between mood and perception of noise—there are less complaints about noise when employees generally feel happier. It is therefore best to design offices with features that promote a sense of control over the physical environment, so that people can experience positive emotions. This is an effective step to address the thorny issue of office acoustics.



## Lighting

Lighting is crucial to an organization's well-being agenda. Light governs innate human functions, it dictates our internal body clock, and it deeply affects our mood. Natural light, or the replication of natural light, governs our perception of day and alertness through the human circadian rhythm. Lighting infrastructure in office environments has now reached a point where it can mimic the sequence of natural daylight to help align the natural body clocks of employees. Connected LED lighting systems can align with this internal process and adjust the lighting throughout the day to influence the energy levels in employees.

Studies have found that effective circadian lighting can reduce sleepiness and increase vitality and alertness in office workers. People are particularly alert and in a more positive mood when they are working under cooler white light, similar to natural daylight, whereas warmer light settings make people feel more comfortable and relaxed. It is important for organizations to assess the correct color temperature to strike a balance between alertness and relaxation for employees.

It is not just color temperature which affects employees. The amount of light employees receive can also affect their performance. This is particularly true of older workers. Generally, the older the employee, the more light that they need to see the same visual detail. This means companies must evaluate the demographics of their workers and understand the level of lighting required to support them.

Many knowledge workers stare at computer screens from dawn until dusk without exposure to natural daylight, so their circadian rhythm becomes disrupted. This can lead to conditions such as seasonal affective disorder (aptly abbreviated SAD), which is a depressive state prompted by lack of sunlight. Organizations can support mood and energy levels in the workplace by adjusting lighting conditions to correlate with circadian rhythms as they change throughout the day.



## Sensors

Recent developments in optimizing office environments have prompted an influx of sensor developers in the workplace industry. It is now possible to use sensor technologies to measure every aspect of the workplace including space utilization, environmental conditions, and even the employees themselves. Recent years have seen employers microchip their own people (yes, really), and hand out sensor-chipped wristbands and head gear to measure employee brainwaves to detect fatigue, stress, and even emotions such as anger. In theory, employers could choose to measure everything, but this would result in an extensive data lake of information of which only a fraction would be useful to the improvement of the company and its employees.

Currently, organizations are overwhelmed with a choice of vendors eager to deck corporate offices with reams of sensors lining every desk, ceiling, and door. Soon, sensors will not be brought in as an after-thought, but instead built into the core infrastructure of the workplace. Environmental and other sensors can be implemented through the existing lighting infrastructure of the office. While it has become a necessity to carry out a degree of environmental monitoring, it is at the discretion of individual companies to understand what their priorities are in what they want to measure.

## The innate connection to nature

Alongside the different environmental qualities that influence sight, sound, alertness, and satisfaction in the workplace—and the technical infrastructures that might monitor and control these states—the story of workplace well-being has an additional dimension. This is *biophilia*, an expression of our inherent inclination to affiliate with the natural world.

Studies have found that people feel more comfortable in biophilic-designed spaces and that they have desirable emotional, cognitive, and physical consequences. Direct access to natural materials, sounds, and sights can reduce stress, enhance creativity and clarity of thought, and improve well-being, according to scientific evidence collected by WORKTECH Academy in partnership with Research Design Connections, Chicago.

Biophilia is often promoted via images of Amazonian-like offices covered in foliage, much like that of Amazon's Seattle headquarters which has incorporated its own giant spherical greenhouses into the campus. But biophilia goes beyond plants, it is any connection humans have to natural processes. This could mean organizations swapping glass and concrete in favor of timber and earthy colors, straight-edged meeting rooms adopting a more curved design, and white noise being replaced by the sound of flowing water.

One of the key elements of biophilic design, which often takes a back seat to plants and foliage, is light and space, which can evoke a feeling of being in a natural setting. This design element can be hard to implement in some workplaces, especially those with large floorplates and little access to natural light. This has led to some companies artificially implementing circadian lighting, and even artificial windows which give the impression of daylight and closeness to the outside.



# Well-being on the rise

While a single organization cannot take total responsibility for transforming the well-being of all its employees, it should nevertheless take practical steps to support a social agenda at work that is growing in popularity and importance. Having the right digital tools, technologies, and systems to enhance physical and mental well-being is no longer an employee luxury—it is becoming a core corporate competency.

In an era of hyper-health, companies need to show commitment to recruiting and retaining future talent. The scientific evidence in support of workplace well-being is growing in abundance and those organizations that are slow to adapt will ultimately lose out. In the future, one can see this trend continue to evolve as organizations aspire to seamless data collection throughout the office building in order to optimize and personalize the environment for each employee every day.



## New technologies to support well-being in the workforce

### Encouraging consensus on temperature

A number of workplace apps have emerged to tailor the temperature experience for employees. Comfy, for example, integrates with an office's heating, ventilation and air conditioning (HVAC) system. It allows employees to make requests from their web browser or smartphone to adjust the office air temperature—blasts of warm or cool air are subsequently created for the next ten minutes. The system makes employee requests visible to everyone to encourage compromise and communication among employees. Over time, the software analyzes usage habits for each occupant and learns workday patterns and preferences. It then tailors heating and cooling flows accordingly, while optimizing them to be as efficient as possible.

### Biophilia linked to brain function

Tech giant Amazon incorporated a set of glass orbs filled with “cloud forest” gardens into its Seattle headquarters, providing an impressive connection to nature for city-bound employees. A trio of connected spheres hosts 40,000 individual plants from all over the world, alongside work areas and meeting spaces for Amazon employees. This space acts as an oasis away from the traditional office setting in the heart of the city. Biophilic design was used by Amazon to spark creativity and improve the brain function of employees.

### Natural soundscaping

Electronics company Plantronics has developed a well-being solution to acoustic problems in open plan office space called Habitat Soundscaping. Specially designed speakers are strategically placed throughout the workspace to create an immersive spatial audio experience that aims to reduce the impact of distracting workplace noise—including speech. Using natural sounds such as falling water, spatial audio tracks are engineered to match and complement visual elements such as digital video with natural imagery. Sensors installed in the ceiling also monitor distracting levels of speech and adjust the soundscape to changing conversation levels.

### Circadian lighting

Prague-based energy company Innogy has adopted circadian lighting implemented by Signify to spike energy levels in their employees to the same effect as a cup of coffee. Based on research, brightness and color temperature levels are programmed to change at key points throughout the day to increase office workers' energy. Workers can override the light settings depending on their needs, and the system can also be set to perform a specific task by using wall-mounted touchpad controls. These can also be used to raise or lower the window blinds.



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