The Welcoming Workplace:
Meeting the challenges of office design for older knowledge workers

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International DMI Education Conference
Design Thinking: New Challenges for Designers, Managers and Organisations
14-15 April 2008, ESSEC Business School, Clergy-Pointoise, France

Abstract

This paper explores the challenges faced by design managers in planning and designing office environments, in the context of two major shifts: a progressive ageing of the workforce and a move towards the knowledge economy.

Rapid demographic change in industrialised nations has shifted the age balance of the workforce. It is estimated that, within the EU, one in two adults of working age will be over 50 by 2020. Such changes in the population profile will be coupled with a shortfall in pension funding, requiring many people to continue to work for longer. There is a growing management realisation that wider organisational knowledge and experience can be lost when a worker retires, so there is a growing desire by managers to retain this knowledge. In addition, new age and disability legislation will provide more legal protection for people wishing to extend their working lives.

Change is also taking place in the type of work we do. Much of the activity that takes place in offices has moved away from repetitive, supervised process work, towards work based on collaboration, expertise and initiative, a common term for which is ‘knowledge work’. Initially, doctors, lawyers, academics and scientists were among the first identified as ‘knowledge workers’. But the term, first coined in 1960 by the economist Peter Drucker, is now considered to extend to most executive, managerial and marketing roles as well as ‘knowledge technologists’ such as computer technicians, software designers, clinical lab analysts and paralegals. As such, many economists and social forecasters now consider the world of work as the world of knowledge work.

Many knowledge workers are, by definition, older workers because these are the people who have amassed the experience and expertise over many years. But their needs and aspirations are not considered in the design of most current workplaces. Not only have these offices been primarily designed for what economists have described as the ‘family formation workforce’

aged 20-45, but they have retained many of the original scientific management traits belonging to the Taylorist office that emerged with the bureaucratisation of industry at the start of the 20th century.

As an approach, Taylorism was based on the organisational template of factory design; it emphasised management efficiency and supervised hierarchy at the expense of individual comfort, social interaction and personal initiative. Today, its echo of the era of mechanistic labour could be considered counterproductive to both knowledge work and the needs of older workers.

This paper sets out the background to the twin challenges facing office design managers and introduces the emerging findings of the Welcoming Workplace[1] study in the UK, Japan and Australia, that is exploring the work environment needs of knowledge workers over 50. The paper concludes with discussion of the observation that this growing and important group will not only require workspaces for concentration and collaboration, but will require 'think' spaces for contemplation and recuperation too.

An office for the 21st century

In early March 2008, the search engine provider Google invited the BBC to report on its new offices in Zurich[2]. This new office, built in consultation with the engineers who work there, capitalises on company policy of a worker never being more than 100 metres from food by installing mini kitchens, snack bars and a full restaurant within its offices. Novel ways of travelling between floors have been installed, including an aluminium slide and a fire pole. Hard-working software engineers can relax, on site, in a number of themed rooms including

[1] We gratefully acknowledge the Designing for the 21st Century initiative jointly funded by the Arts and Humanities Research Council (AHRC) and the Environment and Physical Sciences Research Council (EPSRC) for their support of this research. Grant number AH/E507948/1

[2] http://news.bbc.co.uk/1/hi/technology/7290322.stm

an ‘old English’ style library and a water room complete with tropical fish and massage chairs.

Google prizes itself on putting the needs of its staff first; and in providing spaces to be creative as well as relax, it has clearly thought hard about what its knowledge workers, who are operating at the leading edge of the web industry, require to be productive. However, the average age of staff in the Zurich office is 30, a fact reflected in the use of chutes and fire poles that are hardly age-friendly. If Google’s workforce were to become progressively older, then the company’s current rule that staff should not “slide down the [fire] pole with your laptop” would need to be revised and extended.

The design of Google’s new Zurich office can be seen as far removed from the majority of current developer office stock, which takes neither knowledge-working nor ageing into consideration. Concrete, glass and steel monoliths still dominate most cities, whose interiors reflect the factory floor as opposed to the 21st century office. Such design legacy is widely accepted to echo the engineer Frederick Taylor’s (1856-1915) legacy of time and motion studies, shifted from the factory to the office plan.

Based on Taylor’s drive to develop ‘superior methods and machines’ by standardising the tools and environments of work, the turn of the 20th century saw efficiency and productivity as the drivers for office design. In Taylor’s wake followed such Modernist practitioners such as Mies van der Rohe, architect of the Seagram Building in New York, whose dictum that the office is a ‘machine for working in’ reflected a Taylorist bent. Modernist interior office design twinned with a management agenda geared primarily to maximising the efficiency of the worker under a supervised hierarchy proved surprisingly resistant to change during the 20th century. Today, however, both the demographic curve towards ageing populations and the emergence of the knowledge economy has put that most enduring of alliances – between Modernism and management efficiency – under pressure.

An ageing workforce

In February 2006, *The Economist* reported that the first batch of baby boomers had reached retirement age. The report lamented that in some highly skilled areas such as aerospace and defence, up to 40% of the workforce would be leaving in the next five years, taking a lifetime of expertise with them. Also in 2006 the UK professional body City & Guilds predicted that in four years, the number of young people reaching working age would fall by 60,000 every year, fundamentally changing the shape of the workforce (Humphries, 2006). Between 2010 and 2020, the UK will need 2.1 million new entrants to the adult workforce. This demand that can only be met through a combination of most adults extending their working life and a huge increase in the number of adults re-entering the labour market (ibid, 2006). In Britain, the Office of National Statistics (2007) has predicted that by 2011 the average age of the population will exceed 40 for the first time. By 2017-18 it is predicted that there will be more people over 40 than under 40.

Fundamental change is not limited to the demographic picture. Within the UK, recent legislative initiatives have resulted in more protection for older and disabled workers. The Employment Equality (Age) Regulations (2006) includes protection for older workers against forced retirement before the state retirement age. Additionally, the regulations also make it possible for workers to extend their working life past the state retirement age. Coupled with the guidelines for the Disability Discrimination Act (1995, 2004), age and varied abilities should be considered in the physical design of and access to the workplace.

These shifts are not unique to the UK but a phenomenon across the industrialised world. Healthier lifestyles and advances in medicine mean that most people in the developed economies are living longer active lives. In 2002, the United Nations unveiled the International Plan on Ageing. This protocol not only recognised the rights of older people to continue to work, but also emphasised the wider social benefits of employment of older workers. This included not only relieving the burden of state pensions, and possible other

benefit payments, but also maintaining knowledge and skill within a company or sector – and retaining important social capital.

Healthy ageing and declining birth rates present many previously unforeseen challenges for society. Many older people will remain active in the workplace and will be protected by legislation to ensure their needs are catered for. Design managers within organisations will thus be required to address through the design the inevitable physical effects of ageing in the workforce, such as declining sensory, physical and cognitive functions. Ageing employees require special attention in terms of physical access, lighting, acoustics, air quality, furniture ergonomics, spatial arrangements, material finishes, assistive technology and so on. Failure to address these issues could impact on the employer in terms of legislative processes or lost productivity.

A knowledge economy

Ageing is an inevitable process and human biology does not fundamentally change. But information and communication technologies do – frequently. In recent years the emergence of new technology has driven a wider change in the type of work we do. Much of the activity that now takes place in offices has moved away from repetitive and supervised process work – previously undertaken by armies of clerks but now largely done by computer – towards work based on collaboration, expertise and initiative, a common term for which is 'knowledge work'.

Knowledge work is not a new phenomenon. The economist Peter Drucker originally coined the term in 1960. Initially, it extended to those who worked as lawyers, doctors, academics and scientists. However, as the sphere of knowledge has shifted into the 'information age', so have the professions of knowledge workers. Drucker (2001) identified a new cadre of 'knowledge technologists' such as computer technicians, software designers, analysts in

clinical labs and paralegals and these categories will only increase. Drucker proposed that this increase in the 'knowledge economy' and its supportive workforce is resulting in knowledge becoming the key resource of the 21st century. As such, many economists and social forecasters now consider the world of work to be the world of knowledge work.

Yet whilst the importance of knowledge workers is accepted by innovation-hungry businesses, what has eluded many design managers of work environments is how to design a space that maximises this group's potential. Davenport et al (2002) found that managers and researchers have great difficulty in identifying 'what makes knowledge workers tick', so much so that they often resort to 'bribing' knowledge workers with high wages and expensive settings.

Davenport's observation echoed that of Drucker (1999), who at the turn of the millennium commented that current management knowledge of what made a knowledge worker productive was the equivalent of the understanding in 1900 of what made a manual worker productive. Manual labour productivity rose during the 20th century due to changes in factory and process design, but there remains today a haze of uncertainty as to what kind of work environments will enhance knowledge worker productivity. This is because the labour, if thought of in a traditional sense, is largely invisible, taking place inside the knowledge worker's head, as opposed to comprising a set of repeating manual tasks.

Martin & Moldoveanu (2003) argue that knowledge workers are offered high salaries and expensive settings to work for particular companies. Although high wages and state-of-the-art offices may be highly desired at the beginning of a career, as both work and life responsibilities increase with age, the picture changes: Morison et al (2006) found that many knowledge workers in mid career were beginning to feel frustration with their careers, reporting that amongst employees aged 35-54 nearly half reported feeling 'burnt out', 'bored' and 'bottle-necked'.

Morrison et al (2006) coin the term ‘middlescence’ to describe the sense of frustration, confusion and alienation felt by mid-career knowledge workers for whom a high salary just is no longer ample reward for working. In addition, Morrison et al suggest that restlessness amongst mid career professionals will escalate into a long-term problem if issues of retention are not addressed by businesses soon. Companies may experience ‘brain drains’ as people with essential skills, capabilities and knowledge decide that the conditions of work are not conducive to a happy and healthy lifestyle, especially when the physical requirements of the ageing worker are not addressed.

‘Getting it right’ in terms of creating the optimal work environment has eluded many design managers and organisations. Davenport et al (2002) reports that many companies experiment with the design of their workplace without understanding if such changes improve levels of work satisfaction or performance. Davenport found that whilst many companies had designed ‘informal’ spaces such as indoor streets and coffee bars to encourage interaction between the workforce, often such designated social spaces were empty or used for conventional meetings. Whilst open planned offices encouraged information flow between employees, many reported that open plan was not conducive to work that required full concentration, so they stayed at home to work.

This last point is important in showing that knowledge workers are not tied to the corporate office building or campus, and are thus harder to manage in terms of design. In fact, as Myerson & Ross (2006) explain, knowledge workers tend to work in a distributed way across a continuum of physical spaces – including the home and employer’s office but also public space interfacing with the customer and neutral settings for professional networking with peers. In their book *Space to Work,* Myerson and Ross offer guidance for those required to manage the design of spaces for knowledge workers by identifying four keys realms: the

corporate realm of the ‘Academy’; the professional realm of the ‘Guild’; the public realm of the ‘Agora’; and the private realm of the ‘Lodge’.

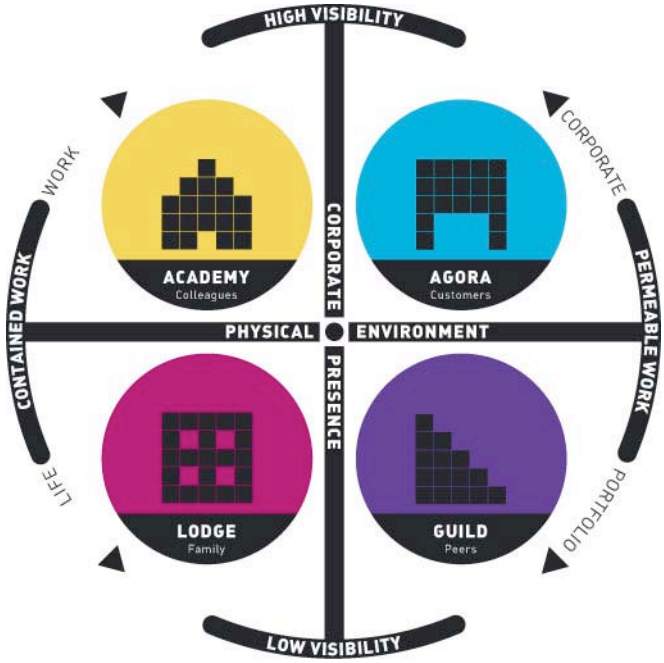

Figure 1: Tensions at Work: Space Strategies for Knowledge Workers (Myerson & Ross, 2006)

The realisation that knowledge workers are as likely to spend their time working at home, in a wireless coffee shop or at professional seminar, as opposed to toiling in the corporate HQ, mirrors an observation of Drucker in 2001, who noted that knowledge workers tended to identify themselves by their knowledge type as opposed to the organisation they work for. Myerson & Ross placed all four realms of knowledge work within a matrix signifying whether the work setting has high or low corporate visibility, and is contained or permeable. Their ‘Tensions at Work’ framework raises a number of challenges facing knowledge workers, such as balancing work and life and balancing a corporate career with a portfolio one in which reliance on one’s own knowledge and expertise comes before allegiance to a particular employer.

Older knowledge workers

Whilst current research on the productivity of knowledge workers may be sparse, research focusing on the ageing knowledge workforce as a discrete category has been practically nonexistent. Studies that have specifically focused on a generalised older workforce have shown that older workers need a range of sensory and ergonomic solutions for comfortable and healthy working, especially within the office environment. This includes consideration of the effects of lighting to accommodate the degeneration of eyesight commonly associated with ageing, wellbeing and energy levels (Knez & Kers, 2000), and age-related hearing loss (Jensen et al, 2005). The ergonomic needs of an ageing body should be considered in the design of chairs and desks for an ageing workforce that may have a heightened sensitivity to musculoskeletal problems (Gay, 2005).

Each of these factors may, individually or in conjunction, contribute to an older worker's discomfort in the workplace. They can therefore be seen as essential elements in designing a successful and productive workplace for an ageing workforce. Indeed, the design of the work environment has been identified as one of the leading factors to be considered in scientific models of 'workability' of the ageing workforce (Ilmarinen, 2001)

Since 2003, researchers at the Royal College of Art Helen Hamlyn Centre in London have investigated the needs of the older worker within a design context and in partnership with industry collaborators. Such investigations, working under the banner 'Office Age', have explored architectural and product-based solutions that have been conceptualised and developed through direct engagement with 'users', namely older knowledge workers themselves. Through direct engagement with users, the design researchers explored the physical needs of the ageing working body but also emotional desires within the working environment. Older workers expressed a desire for décor and surfaces that were not hard and technological but were more organic, with environments giving access to natural light and

green spaces. A variety of spaces offering flexibility of use within the working day was requested by the older worker.

Welcoming Workplace

In January 2007, a new two-year study entitled Welcoming Workplace[3] was set up to look especially at the work environment needs of *older* knowledge workers over 50. This is a global research involving site work in three knowledge industries – pharmaceuticals, technology and financial services – on three continents. The Faculty of Architecture, Building and Planning, University of Melbourne, Australia and the User Science Institute, University of Kyushu, Japan are participating with the RCA Helen Hamlyn Centre on the research, and the work is ongoing.

As part of this study, in September 2006, older knowledge workers from a large pharmaceutical company in London were interviewed regarding their needs. Using the responses from these interviews and existing knowledge from previous studies, the research team used a rapid-response design methodology to build and install design interventions that reflected the issues the interviewees had discussed. The interviews had revealed a number of design issues that the research team would attempt to address. These included the need for a work environment that was sensitive to issues of ageing, but that also recognised some of the major factors of knowledge work such as the need to do highly focused private work and the need to share with others.

In response to these findings, work environments encompassing a number of design interventions were set up on site, on a single floor of the office building. These environments consisted of three workspaces called ‘Collaborate’, ‘Concentrate’, and ‘Contemplate’.

[3] The authors would like to thank their fellow researchers on Welcoming Workplace for their support in developing this paper. Dr Alma Erlich, Dr John Smith, Matthew Harrison MA(RCA) and Catherine Greene MA(RCA).

Figure 2: View of all three intervention zones

Concentrate was based on a typical open plan desk arrangement, and tested the effectiveness of hot-desking arrangements as participants would share desks and use the space for a few hours of concentrated work. The desks included special ergonomic keyboards and highly adjustable chairs as well as a new noise-masking technology, which disguised the chatter and disruptions of a busy open plan office as birdsong or musical chords.

Figure 3: Design intervention ‘Concentrate’.

Collaborate was a flexible meeting space, where furniture could be re-arranged, AV projector and sound equipment was provided, and interactive light setting could be set and adjusted by your computer. This was intended to be a new type of meeting space, facilitating a wider range of group activities by allowing greater levels of user-manipulation of layout, ambience and facilities.

Figure 4: The design intervention ‘Collaborate’

Contemplate was intended to be an entirely new type of workspace, based on the aspirations of those interviewed at the site. Its typology was set somewhere between a library and a home-study. It is a shared space where individuals can go to concentrate in peace, either working at a height adjustable desk or reading in the ‘lounge’ area. The emphasis on the space is on tranquillity within which high productivity can be achieved on individual work, away from the noise and the distraction of the open plane office.

Particularly relevant to older workers, it is a space to gather and recuperate from the high-energy buzz of the contemporary office, and was proposed as an alternative to the traditional 'break-out' areas. Key features included foliage and water features, including a mechanical 'Rain Curtain' screen with working pump. Care-home furniture capable of enhanced comfort, but disguised with new fabrics for the corporate setting, was also included in the Contemplate setting.

Figure 5: Design intervention 'Contemplate'

These three settings were initially monitored for a two-week period in the UK as groups of users occupied them. Scaled down versions were then taken to Japan and placed in a national technology company, and Australia, where the interventions were evaluated by a series of focus groups in two Melbourne banks. In all, more than 100 knowledge workers and

professionals in human resources, occupational health, facility management and design charged with their care were consulted.

From the intervention sites, the research was able to identify that current workspace design provision is not doing the whole job for older knowledge workers. While many of the challenges of designing spaces for concentration and collaboration have been met to a greater or lesser extent, there is a third dimension to knowledge work that older knowledge workers have articulated but struggle to find. This is cognitive space to 'think', to recuperate and recharge the batteries during the course of the day. Much knowledge work requires individual time to reflect, be creative and maintain well being, tasks that knowledge workers over 50 described as difficult to achieve in busy collaborative and open plan areas.

National variations emerged through the study. In Japan, the older knowledge workers reported that they found themselves looking for an alternative space to work so that they could experience a more stimulating environment for collaboration, whereas in the UK the emphasis was on getting away from working directly with colleagues. In Australia, older knowledge workers complained that active encouragement to undertake concentrated work at home was not suitable for everyone's individual circumstances and that the design of the office environment should make adequate provision for concentration as well as contemplation space.

However, across the board, the message emerging from the research was that there is a missing dimension to current office environments that design managers should address if they want to meet the complex and demanding requirements of a growing knowledge workforce, which also happens to be ageing. Without creative adjustment to the way we plan and design offices, there could be major implications for the performance, productivity and culture of tomorrow's workforce. As the first baby boomers reach retirement age, now it the time to

think afresh. Google in Zurich are sending their knowledge employees down an aluminium chute, but they won't be able to do that forever.

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