# Collabor8

## 8 Principles for Successful Collaboration

A new report on the future of collaborative work

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UNWIRED RESEARCH

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# 1. Executive summary

Companies of the future will only survive, let alone thrive, if they become collaborative ecosystems. As companies begin to better understand the importance of collaboration, and as collaboration technologies better replicate and enhance the experience of collaborating in person, we believe the rigid hierarchies which restrict information and ideas flow will break down. The resulting organisations will be much more organic, flexible and quicker to react – driven by seamless collaboration and the unhindered flow of ideas. They will become truly intelligent organisations, built on smart workers and unified technology.

Collaboration can be defined as the process whereby people work together. Traditionally this also meant being together, locating in the same place at the same time. Now, with new technology, connectivity and the 'death of distance', collaboration is being redefined as more and more people experience the potential to work together, share ideas and develop collective solutions.

This report sets out to look at the changing nature of work and the rise of collaboration. It will look at both synchronous and asynchronous working, and review the benefits being derived from early adopters of collaborative spaces. It looks at the drivers of change, from technology and work process, to demographics and sustainability, and defines a set of eight features or principles for the future of collaboration.

There are two types of collaboration in the corporate world – intra company and inter company. The most common area so far has been intra company collaboration where people that work for the same employer work together on projects and processes, both in co-located facilities but also increasingly across distance as distributed teams and specialists need to work together without travelling the globe.

Intercompany collaboration is often more challenging, where people from different companies need to connect and work together. Connecting people not just across different geographies but through different technology and security systems across public networks creates its challenges. But it is this area that will see a dramatic increase as people increasingly demand collaboration with customers, suppliers and partners.

In response, a range of new technological solutions is on the horizon. From high definition video conferencing to unified communications and collaboration (UCC) software, a host of new developments will accelerate the ability to collaborate successfully. New standards such as XMPP will allow inter-company networks - buddy lists and presence to be shared and used seamlessly, so that distributed teams across many organisations can in effect become seamless, working and communicating together.

The increasing realisation that agile working can accelerate processes and speed up decision-making has also resulted in a vision for specialist collaborative spaces and environments. These will become more and more apparent as people understand the benefit of immersive and accelerated development spaces.

One of the key ingredients in collaborative space is the ability for people to use 'augmented technology' – annotating documents and other software together at the same time – so that collaboration feels like an extension of the natural use of pen and paper. 'Haptics' – the use of touch – will have a profound impact on people's ability to use new collaboration tools as interaction and manipulation of data becomes more intuitive and natural.

In the future we predict the continued rapid rise of 'smart surfaces' from interactive screens and displays to digital wallpaper and immersive space. These advanced technologies will be used alongside complementary technology such as high definition video conferencing, mobile technology and cloud-based services. People will collaborate in highly capital -intensive, technology-rich rooms but also 'on the pause' as they connect from a variety of destinations from hotel room to the home. To illustrate this, we have collected several case studies of implementation of SMART's collaboration solutions, from product and sales implementations at O2 and Microsoft, to engineering implementations at Tullow Oil.

And while the impetus for today's generations in the workplace may be travel bans, speed and sustainability, the next generation still at school or college has been brought up with synchronous experiences learnt through social networking, instant messaging and real time presence. They have all been taught with interactive whiteboards in their classrooms, and use mobile technology as a natural extension of their personas. As they enter the workforce in the next 10 years, a natural migration to collaboration and collaborative work will take place.

From our research, we have created 8 principles for better collaboration – the 'Collabor8 Principles' – which will enable companies to collaborate, innovate and drive change. Companies will see competitive advantage through:

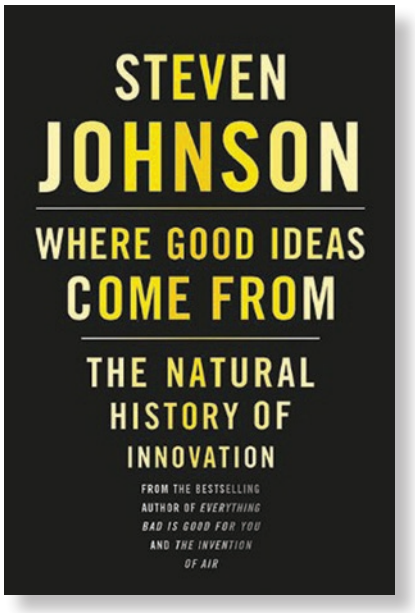
1. Adopting activity based working
2. Becoming less physical and moving to the cloud
3. Digital flow – digitising existing documents and adopting co-authoring
4. Using presence universally across the organisation
5. Encouraging the use of web 2.0 technologies, sharing and social networks
6. Designing better spaces for collaboration
7. Encouraging a new etiquette of collaboration and communication through technology with remote users
8. Changing behaviours with effective change management

# 2. The importance of collaboration

The 'Eureka moment', where one person sitting in a room alone has an idea that changes a product or company entirely, is fast becoming a myth. Real innovation – as opposed to iteration – is driven by people working together, collaborating in highly active environments. This is being seen across the spectrum, from academia to the corporate.

Leading management thinker Steven Johnson has studied innovation through the last two centuries, and concludes in his book 'Where good ideas come from', that 'most of the significant inventions of the last two centuries have not come from flashes of inspiration, but from communal, multi-layered endeavour. Innovation springs out of the 'adjacent possible' – the most inventive places are hives of activity where people get together and share ideas.' These places for innovation can be physical or virtual, in one location or in many – but their defining characteristics are that they host multiple people working simultaneously on the same problem for a common goal.

Global competition and instant communication is driving a global economy which, in the words of new Microsoft CEO Satya Nadella in July 2014, 'does not respect tradition – it only respects innovation'. Large companies which have been around for decades or centuries are finding that they are being challenged by start-ups and new competition to a degree not possible in the industrial 20th century. Companies with today's leading product in a given industry cannot rely on that product to sustain their market share for very long. The only way to meet the challenge of global innovation is for companies to change the way they innovate, through better and faster collaboration.




Knowledge workers are fast becoming the most important drivers of the economy – in new economies and in traditional industries. And it is these workers that need to work together to solve problems. It was Peter Drucker who coined the term 'knowledge work' in his famous 'Landmarks of Tomorrow' publication of 1959 where he defined a mental process rather than physical labour. Knowledge work is both cognitive and social – it requires people to work together but also necessitates individual concentrated time as well.

So collaboration is the process of people working together on knowledge work. It is a process that involves conversation and interaction, allowing people to externalise their own internal thoughts and experiences to make them accessible to others though speech, video, writing and graphic visualisation. These interactions can happen both physically and virtually, either sequentially or simultaneously.

But the perception of work today is that it is predominantly about working on your own. Even as work becomes more collaborative, offices are still designed around a workstyle where the vast majority of time is spent working alone. Desked areas typically represent about 60-70% of an office footprint, but occupancy studies across all types of organisation have shown that only 45-50% of these desks are being used at any one point. This represents a significant proportion of office space which is underutilised, and which should be reused to create collaborative working spaces and environments.

# 3. The changing nature of work and the workplace

The office workplace has changed very little in the past hundred and fifty years; indeed the layout of traditional offices is largely based on that of the factories which preceded them. It is based on the assumption that each worker requires his or her own workstation, and that work is carried out most efficiently when sitting at that workstation. The technologies which developed to enable the knowledge worker – from the typewriter to the telephone to the desktop computer – all fitted in to this fixed workstation approach, the effect of which has been to extend the lifetime of the Taylorist office well beyond its 'sell-by date'.

Traditionally, 'collaboration' was achieved by the movement of paper through the office; to and from desks of different people on the ideas production-line who each added and amended the draft until a final output was created. But ideas and creativity do not follow the same patterns as widgets in a factory – the creative process is asymmetrical, filled with sprints and lulls and relies not only on what you know each collaborator can input, but also on the unexpected contributions. Technologies like fax and email mimicked the paper approach, making collaboration quicker and more efficient, but not more creative or effective.

Having the wrong space in offices is now compounded with new pressures on travel and movement. While it was once acceptable to jump on a plane to attend a meeting or team session, now the combination of sustainability and cost cutting has resulted in new ways to work across distance.

Yet most offices are still based on the assumption that most work that takes place is individual endeavour, which feeds into the collective in regular, formal meetings. Offices therefore become filled with row upon row of desks, with a central core of meeting rooms. The blocking and stacking of these offices usually follows a similarly traditional approach, using the organisational hierarchy chart as a baseline, and folding it only as much as necessary to fit the building footprint.

But collaboration is typically cross-functional, in many cases branching across team and department boundaries. A fixed-desk office model which allowed for this would take the organisation chart and fold it more like a protein into the building footprint. But this approach is unnecessarily complicated, and does not cater for the transient nature of collaboration. Offices designed to enable and encourage the movement of people allow fixed buildings to accommodate the changing business, and support creativity through an increased flow of information and ideas.

The next generation of workplace design provides incentive for movement, as well as recognising that the different activities of a knowledge worker require different workplace settings to support them best. Some activities require quiet, contemplative environments, others noisy and busy, others space to meet, present, write or call. The pinnacle of workplace design based on this principle is known as Activity Based Working (ABW), and is explored later in this paper.

But work and workplace now extends well beyond the confines of the office – technology allows many knowledge workers to be mobile part, if not all of the time. So if many employees can work from home or other remote sites, why would organisations spend so much on providing office space often in costly city centre locations, if it is no more efficient or effective? The purpose of the office is gradually changing in response, becoming more about collaboration, meeting, exchanging ideas and experience – leaving employees to work elsewhere when they need to concentrate and work by themselves.

Whether in the office, or at home, consumerisation is driving the choices employees make about the technologies they use, and the technologies they want to be able to use. With the advent of the smartphone and the tablet, and with laptop prices dropping such that laptop sales globally have overtaken desktop sales, people now typically have better technology at home than they do at work. And there is a strong drive for organisations to allow employees to use their own technology for work – in addition to providing better technology from the enterprise. IT departments, long siloed and used to controlling all technology at work are now having to curate the use of an increasing number of devices and platforms, both on and off the enterprise network.

## 3.1. New ways of working

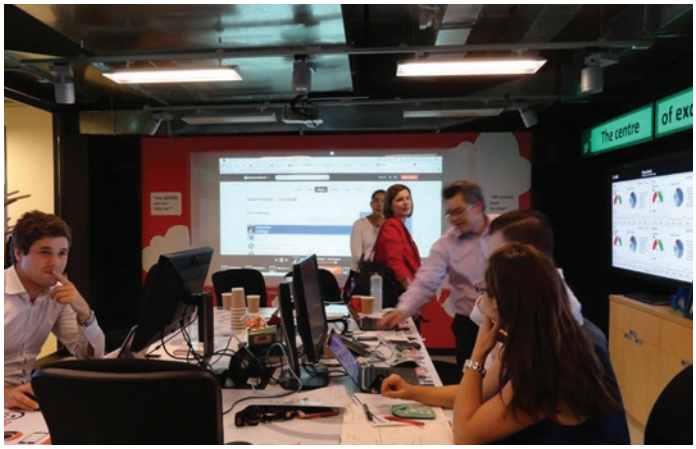
We have seen some changes to the typical office workplace beginning to take place in the last decade, and particularly in the years after the 2008 global financial crisis – but these have largely been driven by cost pressures, not enlightened thinking. A desire to cut costs without an understanding of the changing nature of work has pushed organisations to maximise the number of desks they fit into offices, and maximise the number of people that can sit at them. In short, it has led to hotdesking, desk sharing and smaller desks – which remove ownership of space, and replace it with the same furniture, just less convenient to use.

The office is typically the second largest cost for organisations after salaries – yet the response to the challenge of cost has been largely unimaginative. And in the last few years a small but increasing number of organisations have started experimenting with different ways of working. They have started to design their offices with the recognition that work sits at the collision point of people, space and technology – creating environments that actually supports the real work being done, rather than continuing the old Taylorist paradigm.

This approach requires a number of factors to be put in place, from management culture, new workstyles that enable mobility to enabling technologies that allow place independent working. It is the first stage on a journey towards activity based working.

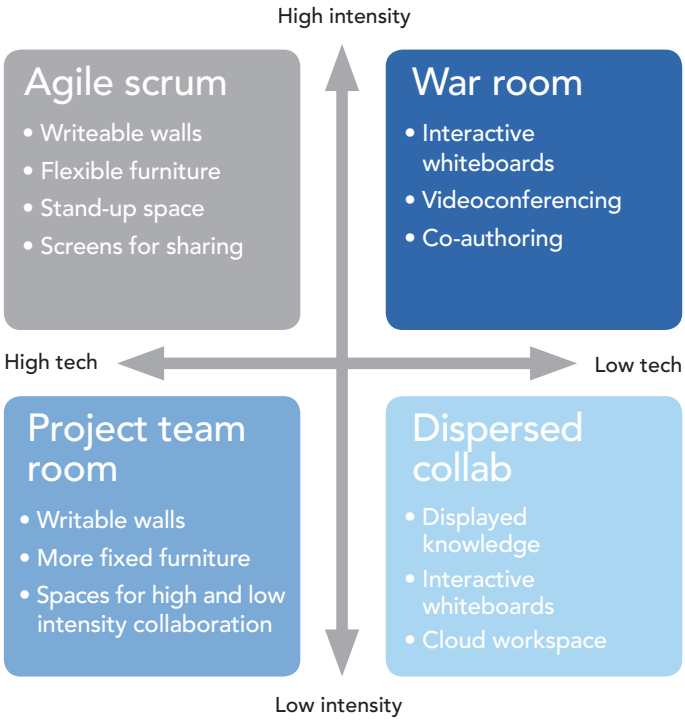
## 3.2. A new paradigm for team space

Research from Washington University found that dedicated project rooms that displayed knowledge and process had 'latent memory' – that is it triggered recollection by participants of the process that was undertaken and not just the results or agreed actions recorded. A leading technology company found that by providing dedicated project rooms to software teams over a period of weeks accelerated development time by a factor of ten.



What is clear is that people who inhabit teams and projects no longer need their own desk at all, and would be much better suited to being located within project space. Whether for a client account, acquisition, M&A, pitch or project, dedicated space can provide dramatic advantages to a team as well as a process.

When designing spaces for collaboration, it must be taken into consideration that there are multiple types of collaboration. Physical collaboration spaces can be understood by the level of intensity of the collaboration taking place, and by the amount of technology in the space. High intensity spaces are designed to facilitate short bursts of structured collaboration, such as agile scrum and project war room spaces – which are typically




adjacent to people's everyday place of work, or desk. A team moves into these spaces at specific points to work together. Whereas low intensity collaboration spaces are designed for longer term use, where project teams will occupy the space permanently for the length of the project. Not all collaboration needs to have technology supporting it, so different spaces should be designed depending on how dispersed the team is and what type of collaboration is happening.

Barclays bank have created a great example of high intensity, low technology agile scrum space at their Canary Wharf headquarters in London. Using very flexible furniture, the space can be reconfigured by users as they need, providing a variety of spaces to work and meet together.

At the other end of the scale of specialist collaboration spaces, National Australia Bank have created a social media war room in their new headquarters, where they continuously monitor and react to their social presence. The walls of this room are covered in screens showing real-time feeds of tweets, mentions, likes, posts, photos and comments, as well as data from social monitoring platforms showing the level of positive or negative commentary.

## 3.3. Third space

With the rise of mobility, work has become more fragmented and staccato – people dip in and out of work, and increasingly 'work on the pause'. The office has become one of a number of locations in which work can take place. But the other spaces in which people try to work are often challenging. A coffee shop, where there may be WiFi connectivity but often has no power

or ability to print. A transport hub where there is no place to get away from noise, or a hotel where there are no private work spaces that are not a bar.

The rise of 'third spaces' is in answer to this challenge. The technological ability to work from anywhere has driven the development of non-office and non-home spaces which offer environments suitable for work but in convenient locations for people to drop in to. These might be spaces to use while on the move and travelling between different sites, or locations nearer employees' homes than the office – providing an office-grade space to work which does not require the same long commute.

Co-working is one answer to this need for third space. The concept of co-working is fast becoming the norm for start-ups across Europe and the USA, and we are beginning to see some corporates adopt the use of co-working spaces as part of their real estate and workplace strategies. Co-working spaces, like those of the Hub and Office Group, typically provide a varied working environment (ranging from hot-desking to Activity Based Working) and all of the technology and connectivity infrastructure to organisations or individuals on a membership basis – per user, per month. A study by deskmag.com in 2013 found that there are almost 2,500 coworking spaces available worldwide, with over 110,000 people working in them – a rise of 83% in the number of spaces available in 2012[1].

For small companies these spaces are ideal because they provide a full office environment with no start-up investment or time, are immediately scalable, allow users to work in a buzzy environment as well as facilitating cross-company sharing of ideas. Large corporates are beginning to look at co-working with interest as a good way of providing spill-over office space at short notice, and providing creative environments for project teams outside of the corporate office.

Many of the large serviced office players are beginning to launch co-working-like services, providing a more formal or corporate form of co-working, often in spaces which are dedicated to one particular company rather than a communal or shared space between companies.

Another approach is more specialised to particular industries, and follows the idea of membership clubs. One of the most interesting of these third spaces is The Hospital, a club for media executives that was set up and funded by Paul Allen (a founder of Microsoft). Members pay an annual subscription, and have use of a building in London's Covent Garden where they can not only work, meet and eat, but also screen a film, use a recording studio or make a television programme in a full, state-of-the-art studio.

[1] www.deskmag.com [accessed August 2014]

# 4. Activity Based Working (ABW)

An article in the Harvard Business Review in the 1980s laid down the principles of a new way of working known as Activity Based Working (ABW). Much as Adam Smith divided people into different types of labour, ABW divides work into different types of activities. It is recognised that during any individual's typical working day, a number of tasks are performed – and each of these activities has a different requirement for space, environment, tools and facilities. An ABW office is designed using a granular understanding of the variety of activities employees do, and then creating spaces and environments for each of these tasks in proportion to their frequency.

ABW has as its premise the basic assumption that the work setting should not be a reflection of the corporate hierarchy or status of the individual, nor should it be homogenised so that a 'one-size-fits-all approach' takes workspace to the lowest common denominator. We believe that as work becomes more footloose, and people begin to understand and experience the benefits of alternatives to the 'factory office', companies will begin to adopt Activity Based Working as the predominant model for work and the workplace.

People move between different ABW settings during their day. They are enabled by a culture that provides a so-called 'circle of trust' measuring outputs and not inputs as well as new technologies such as digital flow solutions, 'virtualisation' and mobility.

One of the key tasks that ABW caters for is collaboration. Whether a high tech space with state-of-the-art technology, or a low tech, sparse environment, to phone-free zones and noisy café style settings, an ABW workplace is a tapestry of inspiring space, where individuals are free to choose their setting not just based on the task at hand, but their mood, who they want to be with and the time of day.

But just as ABW provides for collaboration, it also creates spaces on the opposite end of the work scale, designed for individual and concentrated working. Individual pods, drop-in rooms and 'library' spaces facilitate concentration to an extent almost impossible in a noisy, open plan office. Just as the open plan desk is not the best place to collaborate, it is also not the best place for concentration and contemplation. ABW provides this counter-balanced approach to workplace.

Activity Based Working provides a counter-balanced approach to workplace. Spaces to collaborate and create are side-by-side with spaces to concentrate and contemplate.

# 5. Two case studies of ABW

## 5.1. Macquarie Bank, Sydney, Australia

| Macquarie Bank | | Shelley Street |
|---|---|---|
| FACTS AND FIGURES | Year of completion | 2009 |
| | Number of people | 3,000 |
| | Sq. ft. per head decrease | 30% |
| | Energy saving | 50% |
| | Storage reduction | 78% |

Macquarie's Banking and Financial Services Group (BFS) was looking for new premises that matched its identity, and as part of that search, Macquarie wanted to re-examine the business case for new ways of working. Macquarie's four key needs were a sustainable "healthy building", a "tree" of meeting rooms that could easily be seen, "follow-me technology" that was intuitive to use, and "slinky space" – space that could easily be reconfigured for new functions. One Shelley Street, in the King's Wharf District of Sydney, was identified as a suitable site, and Activity Based Working was the new workstyle that Macquarie felt would make best use of this new space.

The business driver for Activity Based Working at One Shelley Street was speed-to-market – the idea that the workplace had to allow the business to come together very quickly to collaborate and then disperse into different parts of the building to share new knowledge. The goal of this project was for different business units to sit together and then small project teams could come together very quickly and disperse into different parts of the building.

The first move in designing the workspace was opening up the ten-story atrium with 26 "meeting pods" to encourage collaboration and allow clear lines of sight through the financial business. The office itself has numerous "neighbourhoods", housing about 100 workers each. Each floor has Activity Based Working settings based on classic common spaces, such as a Playroom, Coffee House, Library and Garden, where cross-pollination among business groups is encouraged through spontaneous encounters.

The end-result is a radical, large-scale workplace design that leverages mobility, transparency, multiple tailor-made work settings, destination work plazas, follow-me technology, and carbon neutral systems. Embracing this workplace has broken down internal silos by improving collaboration and transparency. Employees are empowered to work and connect with each other as needed in order to build stronger client relationships and staff engagement has increased significantly.

Macquarie recorded the following outcomes:

- Overall energy consumption has been reduced by 50%. The interior staircase, linking the various neighbourhoods, has reduced the use of the elevators by 50%. There has been a 78% reduction in paper storage needs and a 53% reduction in printing paper.
- Nearly 55% of employees change their workspaces each day, 77% are in favour of the freedom to do so, and there has been 90% employee satisfaction since the move, demonstrating an excellent response to the implementation of Activity Based Working.
- One Shelley Street houses 30% more people per square metre than Macquarie's old building at the company's former Bond Street premises.
- The greatest business benefit Macquarie have realised from ABW is the elimination of 'churn'—the cost of moving groups and redefining spaces – with very little spent on churn in the company's two-year occupation.

Photography: Clive Wilkinson Architects

# Two case studies of ABW (cond).

## 5.2. Microsoft, Amsterdam, the Netherlands

| Microsoft | | Amsterdam, Netherlands |
|---|---|---|
| FACTS AND FIGURES | Year of completion | 2008 |
| | Number of people | 900 |
| | Increase in productivity | 25% Employees who are more productive in the new workplace |
| | Reduction in real estate costs | 30% |
| | Sick leave days reduction | From 2.5% to 1.5% |

Bill Gates wrote to Microsoft's employees about 'The New World of Work' in 2005, highlighting the way developments in technology were building bridges 'between disconnected islands of information', and enabling greater communication and collaboration and a new way of working. Microsoft's Dutch headquarters in Schiphol was designed to embody that spirit and message – it was such a successful model that Microsoft has now rolled it out across many of its European offices.

The campus at Amsterdam's Schiphol airport changes the rules. Nobody has a desk, and the workstyle is Activity Based Working. A range of spaces have been created, from small private cocoons for concentrated work and for on screen working and review by one or two people, to open team tables and private, individual carrels. Everyone uses a laptop, and the space has no fixed phones at all, with Vodafone and Microsoft's Enterprise Voice solution providing converged telephony and messaging that is delivered to a person, not a desk. The workplace is almost paperless, with people printing on average only one page each per day.

The feeling that this is not a traditional office begins at the entrance – visitors are greeted by receptionists on their feet, not behind a desk. Visitors are then led to a large communal coffee area to wait for the employee they have come to meet – a space which is also used by employees and managers alike to work on tablets and laptops on the soft chairs.

Further inside the building, a variety of environments has been created to be used depending on the current activity. So there are kitchen tables for individuals, or collaboration for small teams. Other ad hoc meeting spaces make meeting with teams of any size is easy and quick to arrange. For those who need to achieve a quiet focus, there are cubicles available to provide a respite from the buzz of the office. No-one is afforded a private office or an assigned desk.

Microsoft measured the following benefits from the change:

- Reduction in real estate costs of 30%
- Increased productivity of 25%
- Sick leave days reduced from 2.5% to 1.5%
- Employee satisfaction increased from 5/10 to 8/10
- Increased market reputation in the Netherlands

# 6. The geography of interaction

Back in 1971, some pioneering work by T Allen[1] found that people only communicate within a 30 metre radius inside physical space. Further apart was equivalent to being in totally separate buildings. He studied behaviour of researchers in laboratories, and showed that people closest to each other communicated more. Other studies found that people began to interact when they moved around a physical space or were 'seen' in the office. An 'encounter' can then migrate into a conversation and collaboration experience.

Other studies have shown that knowledge workers spend between 20% and 35% of their time in interactions with colleagues[2]. Most of these encounters have tended to be unscheduled and occur in hallways, doorways or the famous 'water cooler' moments that are part of folklore in Silicon Valley. These interactions can be intentional, but more often than not they are unintentional – the chance encounters that were seen by many to be essential ingredients for information exchange but also interactions that led to innovation through collaboration.

But these studies were carried out in an age before technology allowed alternatives to physical, co-located experiences. Now, with the adoption of new workstyles, distributed teams and the pressures on travel, it is no longer enough to rely on a water cooler.

## 6.1. Engineering the water cooler moment

Finding ways of encouraging and creating water cooler moments is a challenge, and being able to quantify their value has been out of reach. But a company called Sociometric Solutions has pioneered a method that puts sensors in employees' name badges that monitor how they move around the office, who they talk to and in what tone of voice.

One client, Bank of America, discovered that its more productive workers were those allowed to take their breaks together (a study in a call-centre environment), in which they let off steam and shared tips about dealing with frustrated customers. The bank took heed and switched the rota to collective breaks, after which performance improved by 23%, and stress levels in workers' voices fell by 19%[3].

We believe that a similar solution could enable companies not only to measure the value of the water cooler moment, but also to understand how collaboration happens in their organisation. This would lead to a way of improving the environments and tools for collaboration in tune with actual need rather than perceived need. Companies that understand their collaboration and can improve it will become more innovative and have a stronger market offering.

[1]Allen, T.J. (1971) Communications networks in R&D laboratories. R&D Management,
[2]Reder and Schwab, 1990; Perlow, 1999; Brill et al., 2001
[3]Presentation by Ben Waber, CEO of Sociometric Solutions at WORKTECH New York 2013

# 7. The changing nature of collaboration

New ways of communicating and collaborating have led to a shift in our understanding of knowledge and idea flows throughout organisations. There are now more opportunities to collaborate, more ways to collaborate and more need to collaborate because of the shift in the global economy towards innovation-driven knowledge work.

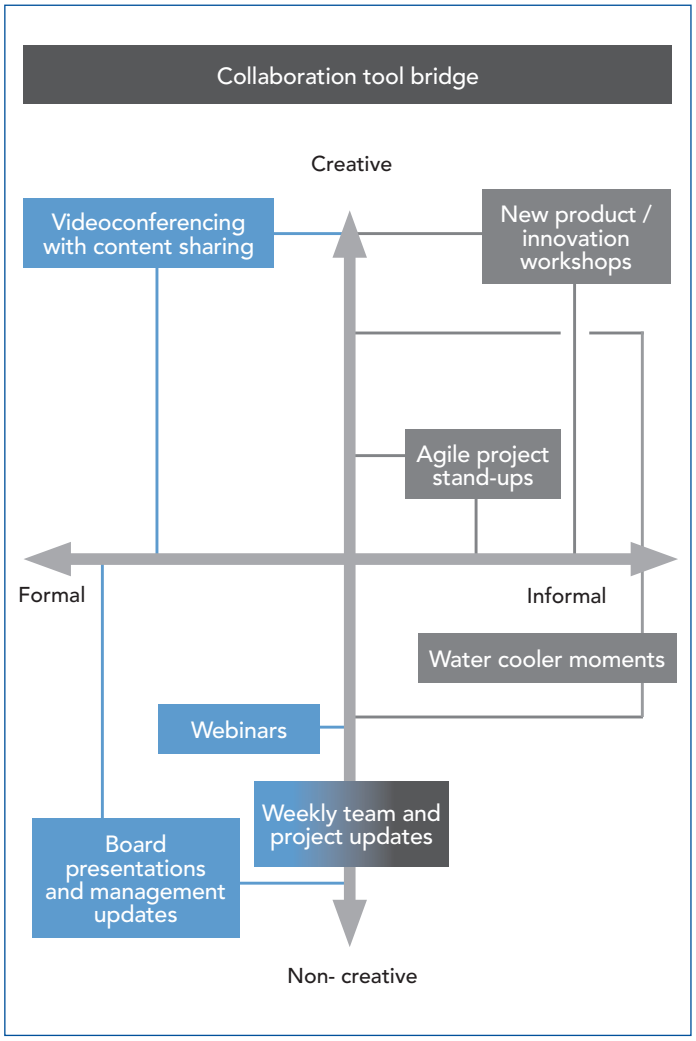
We can begin to understand the collaboration by thinking of it on a scale from 'momentary collaboration' – short instances of people coming together face to face or virtually to collaborate for an hour or half a day – to 'continuous collaboration' – where teams need to work together on an on-going basis. Each of the different points on this spectrum requires a different type of environment, with different tools and facilities.


Previously, both spaces and technologies for collaboration have concentrated solely on the 'momentary' end of the scale, looking at providing for one-off meetings where the collaboration starts and ends at defined times and a defined day. We believe that these will be eclipsed in the coming years by spaces and technologies which provide for the 'continuous' end of the scale – allowing project teams to store all of their documents, interactions and ideas in one place which bridges the physical and the virtual. One-off meetings and workshops will then be able to make use of such facilities.

For collaboration towards the momentary end of the scale, we can further classify the different types of meetings, by both their level of formality and their level of creativity. Formal meetings or points of collaboration typically are organised in advance, they have materials prepared for them and they have a well-defined but limited set of objectives, whereas informal meetings or points of collaboration are less defined and therefore less restrictive. That is not to say that the objectives are not clear for informal moments, but that the possible outcomes are more varied.

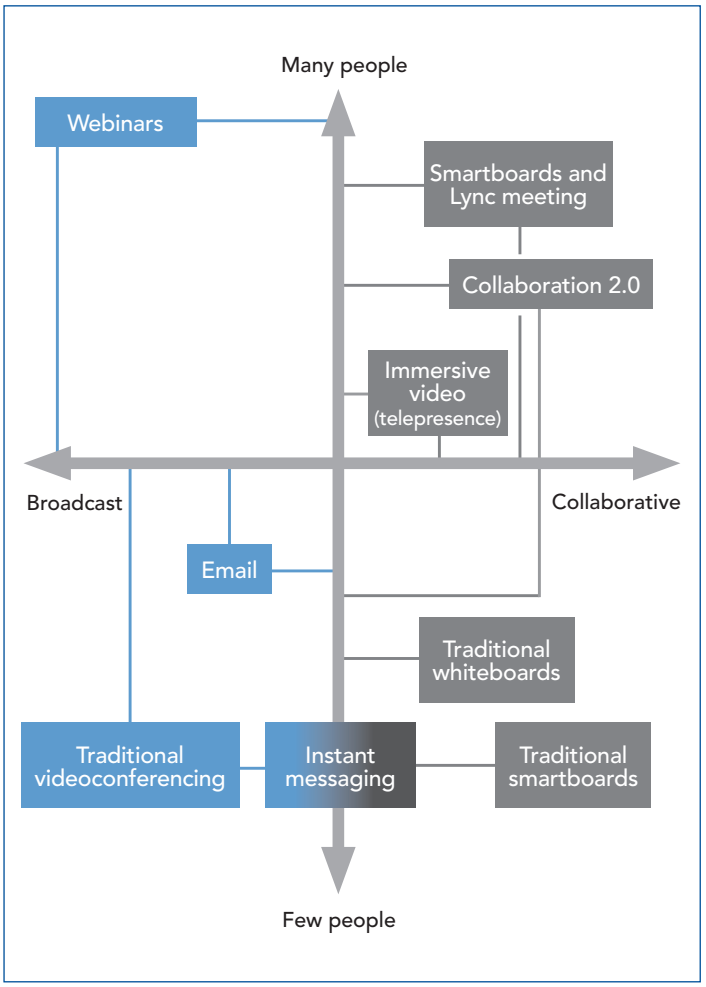
Collaboration occurs on a scale from 'momentary' - short instances of people coming together for an hour or half a day - to 'continuous' - where teams need to work together on an on-going basis. Each of the points on this spectrum requires a different type of collaboration environment and different tools.

The level of creativity is also important – not all meetings or collaboration points need to be creative, as there is and will always be a need for reporting, one-way information sharing and updates. But companies must recognise when they are designing spaces or choosing technology tools for collaboration, that these different typologies of meetings require a different solution. Here we have mapped some of the typical meeting types on to such a scale.




We believe that collaboration platforms and tools will in the future create a bridge across all types of creative collaboration points, from the very formal to the very informal, allowing projects and teams to take advantage of and record every possible opportunity for collaboration. By providing unified systems for enabling and recording collaboration, projects will produce their end products faster, better and more cheaply than in the current model.

As our understanding of collaboration changes, so too do the tools that we use.




Successful collaboration tools in the future will have their core facility to the right of this graph, enabling many or few people to work together in a really creative way, but will also allow the integration of older, existing collaboration tools. Part of the problem that organisations find with adopting new collaboration technologies is that often there is no link with the existing tools, infrastructure and knowledge repositories. This effectively offers employees a choice between using inefficient tools, but with access to existing ideas and knowledge – or using fantastic collaborative tools, but with difficulty accessing existing knowledge and processes.

Today we typically deal with single source information that is usually asynchronous. It is viewed and used 'off-line', and typically it is 'flat' – what you see on screen can be output to paper. Tomorrow, people will use information in new ways; it will come from multiple sources that are typically synchronous, real time or 'live', streamed or delivered to new, always-on devices operating with multiple, simultaneous applications. 'Digital flow' will change the nature of the information presented as depth though URLs, embedded multimedia and hover information means that what you see on screen can no longer be output to paper.

But knowing what tool to deploy for what purpose is not straightforward. A range of options presents a range of challenges, not least in the training and etiquette for a new way to connect and communicate.

# 8. Emerging technology

What is clear is that there is a range of emerging technology that is set to change the landscape for how we work together, both in the same place and across distance. These can all be seen to be transformational technologies, in that they have the potential to alter the nature of how, why and where we work.

## 8.1. Unified communications and collaboration

Unifying all communications and collaboration technologies (UCC) has long been an aim of technology providers and end users alike. Combining audio calling with instant messaging, video conferencing, presence and project/team information portals provides people with a seamless ability to work with each other using both synchronous and asynchronous methods.

Presence and instant messaging have been enhanced by developments such as XMPP and SIP, and these will develop into richer experiences as geo-presence allows not just the state of a person and their real time whereabouts to be displayed, but also their interests and abilities. As well as being able to search and find someone by name, it will become possible to search for people unknown to the user inside the enterprise, by their skillsets – allowing people to find others who can help them with a problem.

In the future, we will begin to see the benefits of UCC outside of the enterprise too, as UCC systems become more interoperable. 2010 saw the founding of the Unified Communications Interoperability Forum (UCIF) by leading players including HP, Polycom, Microsoft, Juniper Networks and Logitech.

## 8.2. Smart mobile devices and BYOD

The computing power of smart mobile devices continues to increase, as they have become the standard phone for the majority of consumers in industrialised economies. Employees are demanding devices that allow them to work from anywhere, and in turn to be able to collaborate anywhere – be those corporate devices, or personal smartphones and tablets. In a 2013 report, Samsung found that 24% of employees reported that a mobile device was their primary computing device for work activities[5].

Despite many IT departments having security concerns about employees bringing their own device for work (BYOD), employees are increasingly doing it regardless. A Microsoft survey in 2012 found that 67% of people were already using personal devices for work, while only 53% worked for an employer which allowed such device usage[6]. In 2013, a Samsung report found that 90% of business expect that having an accepting BYOD policy will be the norm for companies in the next two years[7].

The cloud is powering this ability to work from anywhere as a lot of collaborative software is offered on the Software as a Service (SaaS) model - including the likes of WebEx, GoToMeeting and Lync. This facilities employees using their own devices for work, and so-called 'Martini Working' – any time, any place, anywhere.

Other collaboration platforms are beginning to take the prevalence of mobile devices into account, creating ways for users to integrate their devices into the collaboration experience in-room, as well as creating bandwidth-efficient ways of video and content-sharing on the move. Standards including H.264 Scalable Video Coding (SVC) have increased bandwidth efficiency significantly. Combined with this, 4G (and soon 5G) mobile networks allow video and content sharing from a mobile device for the first time.

New WiFi standards from IEEE are also increasing the ability to use such devices for collaboration with rich media. The latest, 802.11ac, approved in 2014 has multi-station throughput of at least 1 GB per second, up from 600Mb per second in the previous standard 802.11n.

## 8.3. Mobility

There are a number of facets to mobility; the key is the combination of a portable device and high speed connectivity. A lack of pervasive wireless connectivity is often one of the main frustrations holding employees back from true mobile collaboration – a study by Cisco in 2013 found that 46% of employees said that network performance negatively affects mobile devices the most[8].

But the mobility roadmap becomes more overcast as cloud computing allows a new dimension to be realised. The delivery of software as a service (SaaS) from remote data centres is ideal for portable devices that have limitations in processing power,

[5]Samsung Mobile BYOD Index: Comparing IT and End User Outlooks on Bring Your Own Device, 2013.
[6]http://blogs.technet.com/b/security/archive/2012/07/26/byod-is-it-good-bad-or-ugly-from-the-user-viewpoint.aspx [Accessed August 2014]
[7]Samsung Mobile BYOD Index: Comparing IT and End User Outlooks on Bring Your Own Device, 2013.
[8]Cisco Global Work Your Way Study, 2013.

storage capacity and battery life. Processing that is done in the cloud leads to the concept of a thin client that can be used by anyone through a 'virtualised' desktop environment'. Indeed the concept of 'virtualisation' will apply across fixed and mobile devices, as more of the software needed for work is hosted remotely.

With these tools, and data hosted remotely, a new paradigm will emerge – when people come into a space or building they will do so because they need or want to be there. They will no longer have to commute to a 'container for work' because it houses the corporate computing infrastructure.

## 8.4. Wireless presenting and sharing

Spaces for collaboration have long suffered from an excess of cables, and an inability to easily change which device is sharing its content. Rooms which were built for a single device to present via a screen or projector to others ('broadcasting') are not able to support collaboration between users with multiple devices and inputs.

Wireless presenting is a simple way for organisations to take the first step in transforming meeting rooms into collaboration spaces, with the likes of Intel's WiDi, Pixelworks' VueMagic, Sony's Vision Presenter, Christie's Brio and Barco's ClickShare. Multiple devices can broadcast to the screens in a room wirelessly, and can become the main input for the screen quickly and seamlessly.

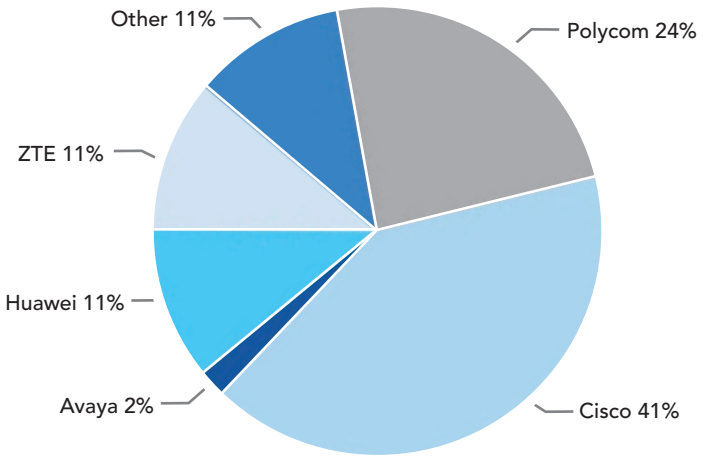
The next generation of wireless presenting is wireless sharing, where users can share not only their screen ('broadcast') but also share their apps, allowing real-time collaboration wirelessly. Mersive's Solstice allows any device connected to the same network to share its apps as does the Tidebreak system.

## 8.5. Video

Video conferencing peaked too early. The adopters of the first systems complained of judder – making participants look and sound robotic. Creating the call was fraught with challenges, and the equipment occupied large, engineered, specialist rooms.

Now much has changed. The rise of high definition video conferencing from the likes of Polycom, together with the high end fixed solutions such as Telepresence from Cisco and Halo from HP has resulted in a new era for video as the experience and quality of collaboration across distance becomes close to being in the same room at the same time.

Global Video Market Share (2013)




Source: Wainhouse Research, 2014

Driven by travel savings, there has been a wide scale adoption of video conferencing as companies realise that they can connect to customers, the supply chain and colleagues across the globe and experience productive meetings and other sessions.

Companies like Oblong believe that the next generation of room-based immersive video will have enhanced interactivity, and offer an ability for devices on multiple platforms to interact with the room-based system. In previous research by Unwired, global companies including Unilever have expressed an interest in deploying a small number of high-end technologically enabled collaboration suites across a global portfolio, which would complement the wider availability of video and collaboration platforms across the enterprise.

But the rise of video is not just about high-end videoconferencing. Companies like Tandberg (now owned by Cisco) first began to launch home videoconferencing 'phones' in the mid-2000s. Initially very expensive, stand-alone home videoconferencing units have come down in price significantly. But they have not become common in homes because of the penetration of webcams for desktops, and in laptops and other mobile devices.

It is these high quality webcams that has led to a huge rise in the use of video for communication and collaboration. From systems such as Microsoft's Skype to corporate tools such as WebEx, people are now getting increasingly accustomed to seeing the person they are speaking to. The next stage of development for cameras in laptops and mobile devices will be a move into three dimensions, providing a more immersive video experience. The Minoru 3D Webcam is an early example, using two cameras about the same distance apart as human eyes to create a 3D video stream, delivered to the device through a USB port.

Other interesting technologies in the video space include Polycom's Unified Conference Station, which turns any room into an immersive video room. Designed to work with Microsoft Lync through a USB connection, the camera uses directional audio to orient itself such that it always points at the person speaking – making the videoconference experience seem more natural and intuitive.

Cisco now report that 60% of the IP packets on their network are now video, and that from 2012 video accounts for the majority of traffic on the public internet. This also represents the huge rise of video as a medium for communication. From the use of YouTube to video casts, people are increasingly familiar with its format and power.

## 8.5.1 Any endpoint video

The next stage for video technologies is a move away from the single-codec model, where only users with a particular device or system can join a conference. One of the reasons that systems like telepresence have not taken off as many expected is that users can only join a conference from one of the telepresence rooms – and because of their expense, companies typically limit these rooms to regional headquarters and large hub offices. Anyone in a smaller or 'spoke' office cannot join, unless they are willing to travel to a hub office.

Innovators in videoconferencing which allows users to join with any device over any network include Vidyo and SMART. As with many other technologies, video is becoming cloud-based and increasingly offered on a user-licence basis – Video as a Service (VaaS) will transform the scalability and penetration of video collaboration in the enterprise.

### TESCO

Tesco, for example, now have an 80 – 90% utilisation of their Telepresence systems and have embraced WebEx collaborative software. They have found that they are saving 2 hours per WebEx user per week and travel costs have been cut by 45%.

## 8.6. Cloud storage and co-authoring

In the past few years there have been a plethora of cloud storage solutions created – some, such as Dropbox and Box, were initially aimed at the consumer, but gradually all of the other main players including Microsoft, Google and Amazon have offered enterprise-grade versions of their online document storage.

These allow employees to work on documents without having to VPN to the corporate servers, allowing far greater speed and flexibility outside of the office, at home and on the move.

Some systems, such as Google's Drive and Microsoft's SharePoint enable co-authoring of documents – which removes the need for email ping-pong of different drafts between authors, and shows complete transparency in how the document was created and where the inputs came from. We believe that co-authoring is the starting point for regular, real, continuous collaboration at work. For the first time, team members in the same building and across the world can create and edit the document regardless of how many other people are working on the same document simultaneously. No longer will there be messages from servers saying 'this document is locked for editing', or duplicate versions created. For many knowledge workers, this will be their first experience of synchronous collaboration.

## 8.7. Intelligent devices and surfaces

One of the criticisms of new technology is that it forces people to change the way they work. Altering a process, even if it means improving it, has issues to do with acceptance and training. Technology 'laggards' often reject such changes.

But much of the current innovation can be categorised as 'augmented technology' – where people's habits and behaviours are only made better by enhancing what they do, not changing behaviours.

The growth of 'haptics' or touch technology has increased the awareness of the potential for change. The success of the iPhone has led to mass understanding of the power of haptics to manipulate data and manage an interface.

People can understand and use haptics without training. It is intuitive and natural, and so provides a strong contrast to the keyboard. In fact the QWERTY keyboard, named after the row of letters in the top left hand corner, was designed to actually slow down touch typists to prevent metal bars colliding. Not a great basis for data entry in a digital age.

Now surfaces will provide multi-touch experiences, and these will be both vertical and horizontal. The use of multi touch plasma screens as interactive surfaces will make the manipulation of software, documents and data more natural.

## 8.8. Cloud project workspaces

As an extension of the UCC technologies above, we are beginning to see the appearance of cloud project workspaces – which combine synchronous and asynchronous collaboration mechanisms for teams and project groups. Tools such as Bluescape capture all of the documents, ideas, scraps and thoughts of the project team and allow any of them at any time to access the project workspace. This begins to blur the boundaries between physical, or face to face collaboration with the virtual – and plays on the importance of latent memory for increasing the effectiveness of knowledge and idea transfer for project teams.

Players from the web- and videoconferencing world like Microsoft Lync, WebEx and GoToMeeting now provide virtual spaces after the conference session, where participants can log back in, to hear a recording of the session, access the documents that were shared and see the comments that people made during the meeting. Offers from Basecamp and Podio add in more social-web aspects to virtual collaboration, linking project management and collaboration through a social-media-like experience.

## 8.9. SMART Room System and Microsoft Lync

SMART, one of the leading providers of interactive displays and platforms, has partnered with Microsoft to integrate their Lync UCC service into the SMART collaboration platform. The system combines touch-enabled displays, HD video camera, microphones and speakers to enable rich audio, video and data collaboration.

It will allow enterprises on the Microsoft Exchange Server to integrate all of their communications with a full-service collaboration platform, and is flexible enough to cope with variations in room size, participant numbers, and bandwidth availability while offering users a simple way to set up a collaboration session on software they are already familiar with.

The whole meeting process is made more efficient, and the usual delays when setting up a videoconference or content sharing meeting are eliminated – movement sensors prepare the screen as users walk into the room, and the Lync system allows the meetings to be started rapidly, and additional participants added intuitively from 'buddy' lists.

The digital ink system works in the standard MS Office programs, so users can record their thoughts and ideas, as well as editing documents in a very similar way to that which they would use working from a laptop or desktop. Anyone who has been invited to the meeting can share their content and add comments in ink – regardless of whether they are in the room, or joining the session remotely.

These notes recorded in digital ink can be saved in the documents, and shared with all participants by email at the end of a meeting, allowing faster decision making, more efficient meetings and real-time collaboration.

# 9. Collaboration

With these enabling technologies, an acceleration in the understanding of the benefits of collaboration will result in a transition for the corporation from the limited, static definition applied today towards a more dynamic and inclusive view of a collaborative future.

The appearance of new tools in future versions of software will accelerate this trend and see a widespread adoption of the principles of collaboration.

Gartner's Collaboration Transition Map describes the shift as follows:

| From | To |
|---|---|
| Single stack | Heterogeneous |
| Application by Application | Universal Queue (one window) |
| On premises | Cloud and Premises |
| Bolt on | Built in |
| Unaware | Aware |
| Enterprise only | Inter Enterprise |
| Developer Driven | Mash up / User Driven |
| Mostly Asynchronous | More Real Time |

What is clear is that the rise of collaboration is also part of the gradual shift to the permeable organisation, where activities no longer happen inside a 'walled garden' but connecting 'outside the firewall' with new communities and partners becomes a necessity.

# 10. SMART collaboration case studies

**With the need for collaboration established, many companies are beginning to experiment with new environments and technology solutions. They are on a journey towards a realisation that much of the future of workspace will be about collaboration.**

**But it is still challenging to find case studies of true innovation and adoption of not just new technology but new techniques and approaches to collaborative work.**

## 10.1. O2

With 29,000 employees across the group servicing 45.8 million fixed and mobile customers across Europe, O2 combines sophisticated voice and data products that help people get more out of their lives.

SMART's collaboration technology provides O2 with much the same benefit, translating into more time, less travel and reduced costs. Uniting disparate teams and enabling them to collaborate effectively regardless of location, the technology wholly supports O2's ethos that "we're better, connected."

### *The challenge*

O2's business case is built around realising efficiencies, improving time to market and reducing costs for the business. The company has multiple offices throughout the UK and headquarters in Slough where it also has two other offices. With frequent travel between the Slough and Leeds locations, the company realised the setup had to change.

"We decided to amalgamate the three Slough offices into one location accommodating 2,200 people," explains Alan Parkin, programme manager, infrastructure design and delivery. "We recognised that uniting disparate teams and improving interdepartmental collaboration was central to delivering an outstanding customer experience. And the infrastructure to support this would be critical to success."

Previously, all meeting rooms contained a conference phone and flip chart, but projectors had to be booked through reception and a great deal of time was wasted simply 'setting up'. With only 47 meeting rooms - half the number previously available - the new Slough site demanded a more productive and collaborative working environment. A smooth and timely transition between meetings would be essential to ensure that the new office has the meeting room capacity to support operational needs. The solution O2 decided to investigate interactive technologies. The decision was taken to trial SMART Technologies' collaboration solutions and five interactive whiteboards were installed across the Leeds and Slough sites. The SMART Boards network using Bridgit™ conferencing software, allowing people in any location to join a data conference, use touch screen commands, write in digital ink over any application, generate and integrate data, share desktops and write and save notes immediately.

The pilot was so successful that almost all of the 47 meeting rooms in the new Slough office will have interactive whiteboards and the boardroom will have two Podiums (formerly the Sympodium interactive pen display). Every floor will also have one or more interactive boards in 'Our Space' areas for impromptu meetings. Road shows are planned to demonstrate the capabilities of the technology and designated "shapers" from each directorate will cascade output from monthly meetings. Supported by user-guide booklets, a self-help intranet portal has also been developed to help users get the most from the new technology.

### *The results*

It has been estimated that if 25% of O2 staff used the new collaborative solutions to conduct meetings, the company could save up to £15,000 a week. The savings would be realised through reduced travel between their Leeds and Slough offices. Alan's own infrastructure design and delivery team of more than 30 people use the technology to generate significant efficiencies from their monthly meetings. Previously, the meeting had to take place on two separate days - one in the North and one in the South - with presenters travelling to both meetings and team members to their respective areas.

This meeting is now conducted on one day, involving the entire team simultaneously. "The reduction in travel, time and associated costs is quite staggering," says Alan. "The senior team has gained a day a month in time and, as no one has to travel, the overall productivity of the team is greatly enhanced. It's a win-win situation for everyone." Location is no longer a barrier to collaboration and a similar pattern is being adopted by teams across the O2 business. For three weeks, one project team of eight people had been trying to meet to approve a design spec but diaries simply would not coordinate. Using the collaborative technology between Leeds and Slough, the work was completed within half an hour, not only saving time and money but also enabling the team to complete the project three months ahead of schedule.

### *The future*

"The impact of SMART's collaboration technology has been so significant that we plan to install the boards in our Leeds, Bury, Preston Brook and Glasgow call centres, as well as rolling it out to offices across the UK," concludes Alan. "Our training department also recognises the potential to train staff using the boards, reducing travel and costs whilst improving productivity. I have no doubt that embracing SMART's technology to drive change in our meeting and training culture will prove transformational for the O2 business."

# SMART collaboration case studies (cond).

## 10.2. Microsoft

MTC Microsoft's Technology Centre (MTC) in Reading, Berkshire hosts hundreds of customers per year - from start-up companies to FTSE 100 companies - to help them understand and improve their business processes.

Depending on the complexity of the problem, the customer meeting could last up to 3 days with Microsoft's Developer and Platform Evangelist (DPE) team often discussing products that have not been officially released yet. With up to six people involved in these meetings, gathering the information exchanged often involved using cameras to capture drawings and notes written on the dry erase boards in the meeting room. Writing up all of the information from the meeting would frequently take up a day or more in time. This also meant that the meeting room itself could not be used during this time as all the information was still on the dry erase boards.

### *Improving meeting efficiency*

Microsoft wanted to improve the productivity and effectiveness of these meetings and decided to install a new meeting room solution from SMART Technologies to achieve these aims. They installed a meeting room system that combines interactive whiteboards, with Bridgit™ conferencing software, ultra-short-throw projectors and multimedia speakers.

SMART Board interactive whiteboards combine the simplicity of a whiteboard with the power of a computer. Users can write notes in digital ink over any document, application or website on the interactive whiteboard and save them as a PDF or PPT file. Marked-up pages, revised documents, diagrams, notes and comments can all be captured easily and e-mailed directly to meeting participants. You can also write and save notes directly into applications such as Microsoft Word, Excel or PowerPoint, Adobe Acrobat and AutoCAD.

### *Increased sales pipeline*

The productivity gains in using the interactive whiteboards are significant. The meeting room solution is enabling Microsoft to work more efficiently. Martyn Davis, Manager MTC Reading at Microsoft, explains "Before we installed the meeting room solution, we used to spend one full day writing up the notes of a meeting. Now we can accurately record all of the meeting notes automatically on the interactive whiteboard – including all the annotations and notes made during the meeting – which wasn't possible using dry erase boards. The information is then saved onto a USB stick and given to the customer immediately after the meeting has finished."

Another benefit of the new meeting room solution is that it has greatly improved the utilisation of the MTC. Martyn continues, "Using the new solution from SMART Technologies, we have improved the effectiveness and efficiency of our meetings and write ups. Because of this we are now able to fit in additional meetings at the MTC. This has helped our sales teams to meet more customers and thereby increase our sales pipeline."

Now when a meeting has finished and the notes from the interactive whiteboard have been captured, it is then cleared of all information and applications closed down making sure that confidential information is not left on view. The room is then ready for the next session.

### *Enriching the customer experience*

The new meeting room solution has enriched the way in which Microsoft and its customers work together. Previously the meeting rooms had dry erase boards which limited the number of concepts to be introduced and worked on at a time. This also acted as a barrier between the Microsoft Architect and the customer.

To overcome this problem, two of the meeting rooms have been installed with two interactive whiteboards creating a multiboarding environment to cater for more complex discussions. Using this configuration, both the customer and a member of the Microsoft team can work on the same diagram but on different interactive whiteboards and describe exactly what they require by annotating over it, bringing in new notes from other sources or launching internet sites.

Customers have told Microsoft that they feel more actively involved in the meeting and that the interactive whiteboards help to break down any barriers to creating new ideas. David Brown, Architectural Evangelist at Microsoft comments, "The meeting room solution has encouraged a richer collaboration and knowledge-sharing environment with our customers. It has definitely helped us to have a more in-depth understanding of our customer needs."

## 10.3. Tullow Oil

Tullow Oil is an international oil exploration and production company with operations in 22 countries, 37 oil producing fields and over 90 licenses. They are headquartered in London and employ over 1,400 people. As Africa's leading independent oil company, Tullow Oil's major investment and activity in recent years has been in Ghana and Uganda. This includes the Jubilee offshore field in Ghana, a world class oil field with up to 1 billion recoverable barrels. Tullow Oil's vision is to become the leading global independent exploration and production company.

Murtaza Amin is the Production Technology Team Lead, based in Tullow Oil's main office in Accra, Ghana. His role is to understand and manage the flow of oil and gas from the reservoir, up the wells.

### *The Challenge*

Managing the oil production process, particularly the interaction between what is happening below and above the surface, is a technically challenging business. For a company like Tullow Oil, it is critically important to know, for example, how much oil is being produced by a well and how the well and reservoir are behaving, but this is a difficult task as it is a very fluid, dynamic process.

This is where the need for real-time data and technologically advanced tools for data handling and team collaboration comes into play. Tullow Oil not only needs to be able to capture the data, but to interact with different locations in using this data and share it with head office.

Murtaza outlined two particular challenges that Tullow Oil needed to overcome: "Oil production operations involve multifunctional teams with geologists, production technologists, reservoir engineers, process engineers, well engineers and others. Traditionally they work in silos with very little interaction but it is important that they come together and understand each other's activities, constraints and issues."

"It is also very difficult to get data from the field. It used to be collected and managed by hand, which was prone to error and delay. This has led to automated systems of data collection and dissemination. As a result, we have a huge volume of data coming in, but this presents a new challenge of how to manage this data in order to optimise operations."

### *The Solution*

At Tullow Oil, they have addressed these issues through a system called 'Technology Assisted Production' (TAP). As Murtaza explains: "TAP not only brings the data together, but processes it and sends it out. This takes a lot of data management work away from engineers, so they can concentrate on using the data to make intelligent decisions."

This is where the interactive whiteboard comes into play. Within TAP, the SMART Boards have a critical role as a key visualisation and collaborative tool. Murtaza explains: "Representatives from all of the technical disciplines within the oil production team can now sit in one room together, show each other the relevant data using the whiteoards and have an informed, joint discussion to take pro-active, multidisciplinary, integrated decisions.

"To host these important discussions, Tullow Oil has a collaborative workspace in its Accra office, where the interactive whiteboard sits. The data is received in real time from their oil production facility, displayed on the whiteoard and used by the multi-disciplinary team. They also use Bridgit™ data conferencing software to collaborate and share data with their Sub-Service Group, their Well Engineering Team and their Marketing Group in Tullow Oil's London head office.

### *The Benefits*

Tullow Oil is now reaping the benefits of its SMART Board-enabled TAP system, as Murtaza Amin explains. "It was previously very difficult to get all the engineers together. It required a formal process just to arrange the meeting, which might happen once a month, and these meetings were not interactive; people spoke then left," says Murtaza. "Now that all the data comes in one room, our engineers come together automatically every day without formal meetings."

# 11. External forces

As well as the trends described above, there are two key external forces which will accelerate the move towards collaboration: demographics and sustainability.

## 11.1. Demographics

We are now working in an era where there are four identifiable generations in the workforce – a result of longer life expectancy, the transition from a manufacturing base to a knowledge-work base, and a consequent later average retirement age. Each of these generations was shaped by different events and societal pressures, each of these generations has a different view of what is important in the workplace, and differ in their preferred styles of working.

### *The traditionalists*

Born before 1945, this generation was shaped by the events of the Second World War, the recent memory of the Great Crash, by the prevailing societal hierarchy and by such attitudes of 'make do', 'the common good' and personal sacrifice. The main technological development of their formative years was the radio. Employees of this generation tend to be the most conservative, they display loyalty and respect for their employing organisations. They show a greater willingness to conform than other generations and exemplify faith in the importance of hard work. Many of this generation are now retired, but a growing number are staying in the workforce or returning to it – often in part time or consultative roles – offering outstanding knowledge and experience.

**Collaboration:** the traditionalists' typical approach to collaboration is point-to-point, with a strong preference for face to face meetings or phone calls over written communication and collaboration.

### *The baby boomers*

The largest generation in the workplace today is the baby boomer generation – those born between 1946 and the early 1960s. Defined by the post-World War Two environment they grew up in, economic growth and the popularisation of the television, they have a strong emphasis on individuality, youth and adventure. They are confident in their prosperity, have humanised the workplace, making it comfortable and encourage innovation at all levels. The baby boomers share the strong work ethic, good communication skills and emotional maturity of the traditionalists. They are the first generation widely to explore retirement in interesting ways, and expect an extended active and vital work life by working part time, telecommuting or consulting.

**Collaboration:** the baby boomers' typical approach to collaboration is point-to-point, using paper and written communication to supplement face to face meetings, with input often defined by the hierarchy.

### *Generation X*

Perhaps the most maligned generation in the workforce is Generation X. Born between the early 1960s and 1980, and shaped by a cautious environment – with worries about recession, inflation, stagflation, the winter of discontent, as well as dysfunction at home – the children of divorce and day-care, Generation X learned to thrive in changing and chaotic circumstances. As a result, they are entrepreneurial, idealistic and set great store by equality of opportunity. They were the first generation to embrace the personal computer in the workplace, and are at home in flexible work environments which are driven by results and not by process.

**Collaboration:** Generation X's typical approach to collaboration is largely point-to-point, but with elements of synchronous collaboration.

### *The Millennials*

Those born between 1980 and the late 1990s are considered the Millennial generation – a generation which promises to exert event more influence than their baby boomer parents. It is a generation celebrated for its confidence, its dedication to equality in the workplace and for its global perspective. It is the first generation to take for granted the integration of technology in the workplace, having grown up at the beginning of the internet era. Having been raised with an almost egalitarian relationship between parent and child, Millennials are more comfortable than their predecessors in working alongside rather than under the generation above. They have a disregard for privacy, adapting to the transparency of social networks and openness of location-aware services – and in an interesting social reversal, for possibly the first time in history, the Millennials are considered authorities on something that the older generation have not mastered in the same way.

**Collaboration:** Millennials' typical approach to collaboration is social, synchronous and non-hierarchical, but with a strong preference for electronic written collaboration over face to face and phone based communication.

### *Looking to the next generation*

The next generation to enter the workforce will be the Net generation – also known as Generation Z or the digital natives. Born since the mid-1990s, they will be even more radical than the Millennials in their attitudes and approach. They have grown up with the internet and widely available personal mobile technologies, and so view technology very differently to the other generations. No longer is it merely a useful tool,

or a cultural expectation, it would not even occur to the Net generation that a workplace would not have deeply integrated technology.

They have been using the internet, interactive whiteboards, smartphones and in some cases laptops and tablets in the classroom from an early age – they will be the first generation to be able to live online, read on screen and be entirely happy with the level of ubiquitous connectivity and the consequent merging of their work and home lives. Collaboration is in the very nature of the Net generation, having encountered early the rapid sharing and communication with a global network that social media allows.

## 11.2. Travel

Time spent travelling – both for commuting and to client meetings – is changing significantly as a result of mobile and collaboration technologies.

Using the Labour Force Survey, the TUC has calculated that UK workers spend an average of 53 minutes commuting each day, with London workers commuting an average of 74 minutes each day. This time is typically harmful, as employees arrive at work stressed, and are often not able to use the time to work or prepare for work given the crowds.

But research has shown that when people work at home, they typically work for around 60% of the time that they would otherwise have spent commuting – benefitting both the organisation and the employee simultaneously. Unified communications and collaboration technologies are beginning to revolutionise the effectiveness of the home and remote worker, allowing them to work with colleagues as effectively from afar as they would have done in the office – meaning that days working from home are not just for admin or individual work. Likewise, time travelling between meetings outside of the rush hour can become far more productive, as mobile devices and cloud-based services allow communication on the move.

UK workers spend an average of 53 minutes commuting each day, with London workers commuting an average of 74 minutes each day.

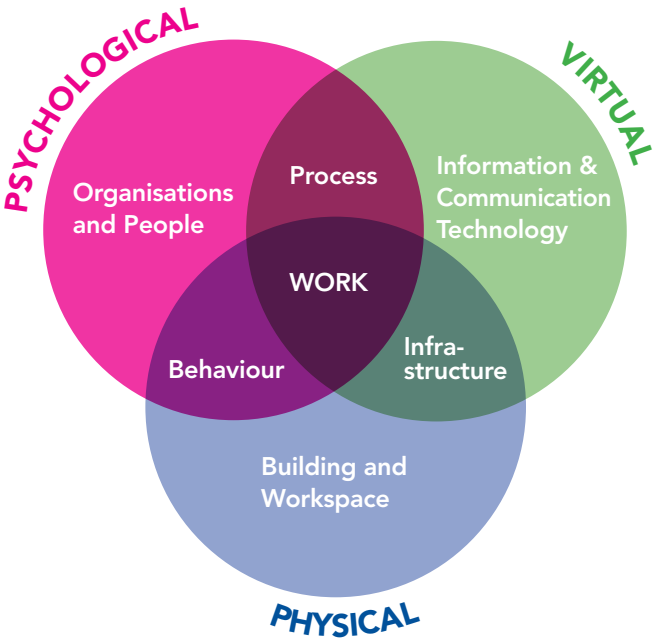
## 11.3. Sustainability

Sustainability is ever higher on the corporate agenda, as regulation and pressure from activist investors increases the demand for companies to operate in a sustainable way. Communication and collaboration technologies can form a big part of this reduction, as reducing the need for people to be physically present to collaborate means that the overall real estate requirement reduces too. In the UK, 40% of carbon emissions arise from buildings – which gives an idea of the scale of the achievement possible.

In one example, the Carbon Disclosure Project has calculated that if companies in the USA and UK deploy 10,000 telepresence units by 2020, the wider economy will see financial benefits of $19 billion, while cutting carbon emissions by 5.5 million tonnes (which is equivalent to the annual greenhouse gas emissions of 1 million of today's passenger vehicles)[1].

[1] Carbon Disclosure Project Study 2010: The Telepresence Revolution

# 12. Collabor8 - Eight principles for successful collaboration




To achieve success, we have identified 8 principles for successful collaboration. As the diagram illustrates, the move to a different style of work requires integrated thinking between the three key pillars of any organisation – its people, its workplaces and its technologies. By looking at the psychological, the physical and the virtual, a different set of behaviours can be established (such as collaborative work) with new processes supported by innovative infrastructure.

Our 8 principles are as follows:

## 1 ABW – the agile business

People no longer inhabit their offices or corporate desks. Surveys show that in the average workplace, fewer than 50% of the desks are occupied at any one point in time. A new approach to the workplace is need, based around teams and tasks and not departments and functions. This approach is called Activity Based Working and it is the future for agile organisations.

To adopt Activity Based Working requires a fundamental rethink of the need for and provision of workspace. It requires a detailed understanding of the workforce – by profiling and identifying discrete cohorts. Typical working days must be mapped and then a range of task based settings with appropriate enabling technologies delivered. The cost benefit is complex, but one of the clear winners will be a reduction of real estate overhead – typically by up to 30%. Microsoft, Interpolis and BT have all seen 30% cost reductions, with Macquarie Bank seeing a 23% increase in building capacity.

Corporate agility will become one of the key drivers for collaboration – speed to market, speed of decision making between dispersed teams and the ability to remove downtime and make better use of expertise will all drive collaborative best practice.

## 2 Become less physical - migrating to the cloud

Bringing people into the physical remnants of yesterday's order is not collaborative. Desks laden with paper in buildings stuffed with fax machines, computers, servers and software is not a vision of the future.

Companies need to become more footloose, and virtualise their infrastructure so that the office does not represent the corporate DNA. As this moves into cyberspace, people will only come into the workplace for one reason – to be with people. And as occupancy of buildings becomes more fragmented and work disperses, people will need to collaborate and communicate across distance.

The growth of the cloud will have a profound impact on collaboration. On-premise systems will migrate to a range of hybrid solutions, usually blending on-premise voice with external software so that people can connect from anywhere. Tomorrow, we believe that collaboration systems will be cloud based applications as the software is provided as a service (SaaS) to people as and when they need it.

The empty building is the logical conclusion of the journey towards cloud based computing; a building devoid of all infrastructure, software and processing power – in effect people will come into a building only to be with and work with other people. The empty building will be a collaborative space for teams, training, mentoring and socialising. It will represent the corporate brand and provide a narrative space for the business.

## 3 Adopting digital flow

Paper has always dominated work and the workplace. An estimated 17% of floor space is used to store paper in the office today. And paper is in effect the antithesis of collaboration – it can't be shared - it is analogue and off-line. In days past, paper flow was passed

between people through the internal post system, with each recipient adding comment in different colours in a slow sequential process that resulted in a collective review. But this process is iterative and laborious, and early commentators cannot see the suggestions of those later in the chain.

Now digital flow is set to change the rules. The previous IT revolution was essentially to turn paper digital – what you viewed on screen could then be re-output to paper and would, to all intents and purpose, look the same. No longer. Now the screen has depth with URLs and hover information that cannot be reproduced in two dimensions.

Digital flow will result in a slow death of paper and move people into the digital realm that will naturally encourage interaction and collaboration between documents being developed in on-line, real-time systems.

## 4 Always on - the corporate jelly bean

One of the drivers of collaboration will be the increasing acceptance of networks, from 'social' to corporate. But there has been a barrier to creating networks between companies. A new standard called XMPP is set to change this, allowing a 'buddy' to be added from another company to internal network lists for example on Microsoft OCS.

Fluid 'buddy' lists will provide presence indicators to show the real time availability of people both inside and outside the corporation. Teams, be they distributed or co-located, will be visible.

The corporate jelly bean means the adoption of a strategy for converged communication and collaboration so that these applications function seamlessly across the enterprise.

## 5 Web2.0: Defining a corporate folksonomy

Derived from the combination of 'folks' or people and taxonomy or the science or ordering information, folksonomy has become synonymous with social or 'collaborative tagging' – a phenomenon of the so-called 'social web'. In effect it combines the process of tagging or labelling to categorise content by people in a social context.

Web2.0 was moving the internet from an approach based around the activities of 'find and use' to a concept of 'share and expand'. Folksonomy develops these themes and advances the concept of the 'semantic web' to a future where collaboration can become meaningful within a corporate community.

The experience of people using applications such as social bookmarking (Del.icio.us) and social photo sharing (Flickr) shows the acceptance of tagging in the public domain. Corporates need to embrace this and start building the foundations for future collaborative systems.

## 6 Collabor8 Space

What is clear is that collaborative space, rich in technology, with flexible infrastructure and versatile settings will be a critical success factor. Physical space shapes behaviour, and so by creating the right collaborative space, the behaviours desired for collaborative work can be shaped.

## 7 Collabor8 Etiquette

People no longer have the tools to know how to communicate well, let alone collaborate properly. The rise of the audio conference and then video have challenged people to find a new etiquette for communication. Now data conferencing will change the rules again. This is confounded by the other formats of communication that exist today, from formal letter, through fax to email, instant message, text message, web discussion forum, tweet or blog. What medium do you use for what purpose and in what format?

A new guide to collaboration and communication etiquette is needed, together with a new language – the rules need re-writing.

## 8 Collabor8 Behaviours

The final ingredient to successful collaboration has to be the desire to collaborate in the first instance. The process of interaction requires trust and openness and a desire to work with other people for the common good.

A change management programme needs to be introduced to allow people to understand and identify new behaviours necessary for successful collaboration. Psychometric types suggest that it is often extroverts that dominate team sessions, while introverts find it hard to contribute. Systems for inclusive collaboration and behaviours that allow democratic participation are essential for success.

# 13. Futures

We have moved through different phases of collaborative work over the past decades, each with added benefits. First we had basic information sharing, then transactions, followed by interaction and now true web2.0 collaboration.

SMART Technologies have defined four 'dimensions' of collaboration technologies – talk (audio conferencing), see (videoconferencing), share (screen sharing) and interact (touch technology). The first three are really just about communication rather than collaboration – they are a passive information sharing processes. But with touch technology and virtual meetings, active collaboration has now become possible. Teams can collaborate in a shared digital workspace, writing on and editing documents simultaneously, building on ideas and leading to real innovation.

Where do we go from here?

## 13.1. Immersive space

One of the key requirements will be specialist space that achieves corporate competitive advantage. Accelerated process environments, 'deep dive' spaces where complexity and modelling can be achieved, highly immersive visualisation environments (HIVEs) where complex stimuli can be identified and understood will all be part of a range of future spaces that will be the destination of much corporate collaborative work.

There are already examples of these futures around the world. For example, the 'iRoom' at the Yang and Yamasaki Environment and Energy Building in Stanford University provides a dynamic, connected environment. And this situation will get more interesting as the leading players in workplace furniture begin to innovate and bring new products to market.

## 13.2. Workplace innovation centres

We believe that a new typology of innovation space needs to be developed that creates a place for people to work together. Not a meeting room with its table and chairs, or a lecture theatre or break out space, but a fully equipped, enabled resource that provides a stimulating place for people to be creative and collaborative.

The space has technology within in, not just attached to the walls but inside the space, and whole surfaces can become digital and interactive. The space is inclusive and has all functions within it, from print and scan to tea and coffee. People can move between collaboration and concentration, while knowledge and ideas are still displayed for reflection and contemplation.

These future spaces will become sought after in the corporation and will begin to grow in importance as the need for solo work at the desk diminishes.

The four 'dimensions' of collaboration technologies are
'Talk' – audio conferencing
See – videoconferencing
Share – screen sharing
Interact – touch technology

## 13.3. Interoperability and Collaboration as a Service

As more collaboration happens between people who are either not in the same office, or are outside the office, there will be an increased drive towards interoperability of communications and collaboration platforms, allowing them to be accessed and used on any device, over any network and from any location.

Companies are increasingly using more contractors, and the whole employment model is shifting such that the ability to collaborate outside of the enterprise IT sphere will come to dominate future innovators in collaboration technology. Just as cloud video is allowing Video as a Service (VaaS), we believe that collaboration platforms will be almost universally offered on a per-user basis, bringing Collaboration as a Service (CaaS) to the fore.

Just as cloud video is allowing Video as a Service (VaaS), we believe that collaboration platforms will similarly bring Collaboration as a Service (CaaS) to the fore.

## 13.4. Collaboration intelligence

Collaboration tools allow knowledge workers to work creatively together for a common goal – but they also have a subsidiary benefit. Data from unified collaboration platforms will allow the enterprise the study the enterprise at work, giving them a far better insight into the 'real organisation' – which people work together, and how, where and when people collaborate.

Using Big Data analysis techniques, the enterprise will be able to tweak their collaboration tools and spaces to match the type of work actually being done – in the same way that Activity Based Working spaces match the spatial design to the work being done. One company, Connect Solutions, has even predicted that the enterprise will be able to predict other events, such as which employees are about to resign based on their collaboration profile.

## 13.5. Merging of physical and virtual collaboration

We believe that unified collaboration tools will eventually lead to the merging of physical and virtual collaboration spaces. We are currently seeing the beginnings of a market in virtual project and team space, allowing users to access the 'project room' from anywhere and at any point, but also allowing them to work synchronously with colleagues in the space. The physical spaces in which we collaborate in turn will become far more technologically enabled, and the 'window' between the physical and the virtual rooms will seem to have ever thinner glass.

# 14. Conclusion

In the knowledge-work economy, companies that innovate successfully and repeatedly will gain competitive advantage and grow in market share. This is particularly relevant now as the speed of development now means that the history and past performance of a company is much less of a guide to future performance than it used to be in the 20th century economy.

Collaboration needs to be at the core of a company's innovation strategy - enabling better team working, faster decision making and increased creativity. This should be achieved through better design of spaces for meetings and interaction, better use of technology for in-room and remote collaboration, and through training employees in how to work together better.

We believe that companies that adopt the Collabor8 principles will be able to realise this increase in collaboration, to become more nimble, produce better products, be faster to the market and derive a range of cost-benefit advantages.

# About the authors

## Philip Ross

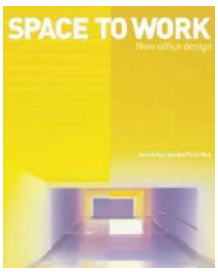
Philip is CEO of the UnGroup (Unwired Ventures and Unwork), specialists in the impact of emerging technology on people and their behaviour in the built environment.

He has worked with organisations such as Ernst & Young, Allen & Overy, GlaxoSmithKline, Cisco, McKinsey & Co, Nottingham City Council, PricewaterhouseCoopers, Royal Bank of Scotland, Jones Lang LaSalle and Ericsson on future concepts based on emerging technologies.

Philip has spoken at conferences around the world including the Wall Street Journal Europe CEO Forum on Converging Technologies, alt.office in the USA and Corenet's Global Summits in Beijing, Auckland, Orlando, San Diego and Melbourne. In 1994 he wrote and published The Cordless Office Report and founded Cordless Group.

He has written three books on the future of cities, work and workplace: The Creative Office, The 21st Century Office and Space to Work (all co-authored with Jeremy Myerson). He has also contributed to a number of other books including the Corporate Fool and the Responsible Workplace.

Philip has written the three global bestselling books on the future of work and place:






## Luke Connoley

Luke is Associate Director at Unwork. He advises on the future of work, enabling clients to understand the value of and business case for new ways of working and agility at work. He is committed to understanding the forces influencing work and the disruptive technologies, events and behaviours leading the change.

He is passionate about bringing together experiences, innovations and best practice from a variety of industries to each project that he works on – as many of the best examples of innovation are disruptive rather than iterative.

Luke also heads up Unwork's wide-ranging and varied research programmes. Covering a broad range of topics, from behaviour to technology, from the workplace to the high street, he is responsible for keeping the group and its clients up-to-date through white papers, studies, interviews and articles.

He has worked with a huge range of companies across industry boundaries, highlights of which include Barclays, the BBC, Argos, Aramark, Ernst and Young, Homebase, Google, Jones Lang LaSalle, HoK, Barclaycard, Deloitte, Lend Lease, Orange, Zurich Insurance and Sodexo.

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The research was conducted by UnWork.

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