FLUID COLLABORATION
Exploring the future of collaborative work

Insight Report

avocor™

In partnership with

WORKTECH™ ACADEMY

Contents

In this Insight report:

About Avocor

Avocor creates, develops and manufactures market-leading touch technology hardware, software and accessories designed to enhance the meeting and learning space. With offices in Surrey and London, England as well as Oregon, US, Avocor focuses on delivering solutions on a global scale that provide an unrivalled experience for its customers through an extensive and experienced partner network.
www.avocor.com

About WORKTECH Academy

WORKTECH Academy is a global knowledge platform for the future of work and workplace, bringing the best insights, ideas and evidence from the WORKTECH conference series to a community of professionals all over the world. The Academy's content is curated in six streams: people, place, technology culture, design and innovation. Avocor is a Corporate Member of WORKTECH Academy.
www.worktechacademy.com

1. Executive summary

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

These emerging and expanding vistas of advanced collaborative work require new collaboration tools, spaces and behaviours to succeed. This Insight Report, prepared by Avocor in partnership with WORKTECH Academy, looks at the future of collaboration over the next five years, identifying key shifts in practice and critical success factors.

The report begins with a review of the importance of collaboration within the global knowledge economy, noting the 'communal, multi-layered endeavour' and the 'adjacent possible' that creates innovation, as management thinker Steven Johnson has described the process. It sets outs three key drivers that are shaping a new paradigm in collaborative work – changing demographics, which require communication strategies to be re-evaluated; the rise of sustainable cities, which are pushing more remote working solutions; and corporate space redesign, which is opening up the possibilities for dedicated, high- and low-intensity collaborative spaces within the context of agile and activity-based working.

Five major shifts are identified in the report, as collaboration moves from intra- to inter-company, from momentous to continuous, from generic to dedicated spaces, from co-located and ad hoc to remote and planned, and from single-source and asynchronous to multiple-source and synchronous. To address these dramatic shifts and enable organisations to benefit from the innovative ideas that flow from better collaborative processes, the report proposes a concept termed Fluid Collaboration as a coherent response.

As an approach, Fluid Collaboration has four main elements: Fluid Space, which explores new environments for complexity, modelling and immersion; Fluid Tech, which increases the interoperability of communications and collaboration platforms, allowing them to be accessed and used on any device, over any network and from any location; Fluid Culture, which supports a move away from paper to digital flow and introduces a new digital code of etiquette; and Fluid Intelligence, in which feedback data from unified collaboration platforms will give better insight into how the organisation really works.

The report concludes with two Avocor case studies that demonstrate facets of the Fluid Collaboration approach, and a look at the future in which physical and virtual collaboration spaces begin to merge.

2. Importance of collaboration

Collaboration now matters more than ever before to organisations of every size and type. Their survival – never mind their success – will depend on how effectively they operate as collaborative ecosystems.

Today's global, tech-driven knowledge economy doesn't respect tradition – it only respects innovation. As companies better understand the importance of collaboration, and as collaboration technologies better replicate, enhance and augment the experience of collaborating in person, many of the barriers that inhibit the flow of new information and ideas will be broken down.

For that to happen, organisations will be required to take the tools, settings and protocols of collaboration very seriously indeed. Their reward will be to become much more flexible and quicker to react – driven by seamless teamwork and the unhindered flow of ideas. They will become truly intelligent organisations, built on smart workers and supported by unified technologies enabling better and faster collaboration.

Leading management thinker Steven Johnson has studied innovation through the last two centuries, and concludes in his book *Where Good Ideas Come From* (Penguin 2010) 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 'inventive 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. They are also populated – physically and virtually – by knowledge workers, whose patterns of collaboration are becoming more sophisticated than ever before.

It was Peter Drucker who coined the term 'knowledge work' in his famous *Landmarks of Tomorrow* publication of 1959, in which he defined a mental process rather than physical labour. Nearly 60 years later, Drucker's early pronouncements on knowledge work hold true: this type of work is both cognitive and social – it necessitates individual concentrated time but requires people to work together as well. 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, moving image, writing and graphic visualisation.

What has changed - dramatically so in current times - is the context for collaboration with a set of external drivers reshaping collaborative approaches in the workplace.

3. External drivers

What are the key external drivers of change in collaborative work? We believe there are three powerful shapers of a new paradigm in collaboration – demographics, sustainable cities and space redesign.

3.1 Demographics

Walk into any large open plan office in any large city and you will find four identifiable generations at work in one place – a result of longer life expectancy, the transition from a manufacturing to a knowledge economy, deferred retirement due to pension shortfalls and longer working lives as a result. Shaped by different events and societal pressures, each generational has its preferred style of working and approach to collaboration.

Traditionalists (born before 1945) remain in the workforce or return to it – often in part time or consultative roles – to offer wisdom, knowledge and experience. They tend to the most loyal and conformist workers, and their typical approach to collaboration is point-to-point, with a strong preference for face-to-face meetings or phone calls.

Compare that approach to the Baby Boomer generation – those born between 1946 and the early 1960s – who have more of an emphasis on individuality, adventure and innovation. Their typical approach to collaboration is also point-to-point but using written communication to supplement face-to-face meetings, often based on hierarchy.
Generation X workers (born between the early 1960s and 1980) have learned to thrive in changing and chaotic circumstances. As a result, they are entrepreneurial, idealistic and flexible, driven by results and not by process. Generation X's typical approach to collaboration introduces elements of synchronous collaboration.

The Millennial generation (born between 1980 and the late 1990s) has a different perspective again. This 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. Their typical approach to collaboration is social, synchronous and non-hierachical, with a strong preference for electronic written collaboration over face-to-face and phone based communication.

The next generation to enter the workforce will be Generation Z, also known as 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. Generation Z has 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 on-ine, read on screen and be entirely happy with the level of ubiquitous connectivity and the consequent merging of their work and home lives.

The future of collaboration will depend on creating flexible and inclusive tools and platforms that enable all the different generations now present in the workplace to participate – but there will be particular emphasis on the needs and expectations of the Millennial and Generation Z cohorts who will form the main employee base in the future.

3.2 Sustainable cities

Cities, governments and corporate organisations all recognise the urgent requirement to reduce the environmental impact of doing business. Vocal calls by activist investors for companies to operate in a more sustainable way is being matched by a growing political will among policymakers and legislators to reduce the carbon footprint by encouraging smarter ways of working.

Unified communications and collaboration technologies have a key role to play in this debate, as they have the potential to revolutionise the effectiveness of remote working, cutting down on travel time and commuter miles. For 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 nearly £12 billion, while cutting carbon emissions by 5.5 million tonnes.

As cities seek to become healthier and more sustainable, with reductions in congestion, stress, air and noise pollution, the impact of mobile and collaboration technologies – which enable more productive work on the move or from a variety of different locations without having to be physically present in one place – will increasingly take centre stage.

3.3 Space redesign

Organisations are radically rethinking how they use their precious resource of office space. The Taylorist workplace, with long rows of desks based on the production line of a factory, is becoming obsolete in the digital age of collaboration. Low occupancy rates coupled with rising real-estate costs have encouraged companies to think afresh about space redesign.

Traditionally, 'collaboration' was achieved by the movement of paper through the office, to and from the desks of different people who each amended the draft until a final output was created. Now companies recognise 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 it relies not only on what you know each collaborator can input but also on the unexpected contributions.

Technologies such as fax and email mimicked the traditional paper-based approach, making collaboration quicker and more efficient, but not more creative or effective.

Meanwhile, office buildings continued to be traditionally stacked with row upon row of desks, with a central core of formal meeting rooms. Now things are changing rapidly as organisations experiment with a number of new spatial ideas to support collaboration.

Activity-Based Working (ABW), for example, provides different settings for different tasks within the office building – it is a concept that advocates dedicated spaces for collaboration, such as agile scrums, project rooms and war rooms.

Corporates are also making growing use of 'third spaces' outside the office building, decanting premium knowledge workers into co-working venues that bring professional peers together and are perceived to provide higher levels of comfort, hospitality and mission. Buzzy and animated co-working spaces are fast becoming the norm for start-ups in Europe and the US; in the way that ideas and experiences are exchanged between individual and across different organisations, co-working is influencing the discourse around smart collaboration, especially in the interaction between start-ups, scale-ups and large corporates.

4. Emerging patterns

Our survey suggests six major shifts in the nature of collaboration, all of which hold key implications for the future of collaborative tools, settings and behaviours.

4.1 From intra-company to inter-company collaboration

There are two types of collaboration in the corporate world – intra company and inter company. There is now a shift from intra company collaboration, where people with the same employer collaborate on projects both in co-located facilities but also across distance as distributed teams, to inter company collaboration.

The second type of collaboration is more challenging as people from different companies using different technologies and security systems are required to connect across different geographies. Inter company collaboration is multi-dimensional and complex but this area will see a dramatic increase as people demand more collaboration with a wider network of customers, suppliers and partners. Collaborative technologies will therefore have to evolve to meet this challenge.

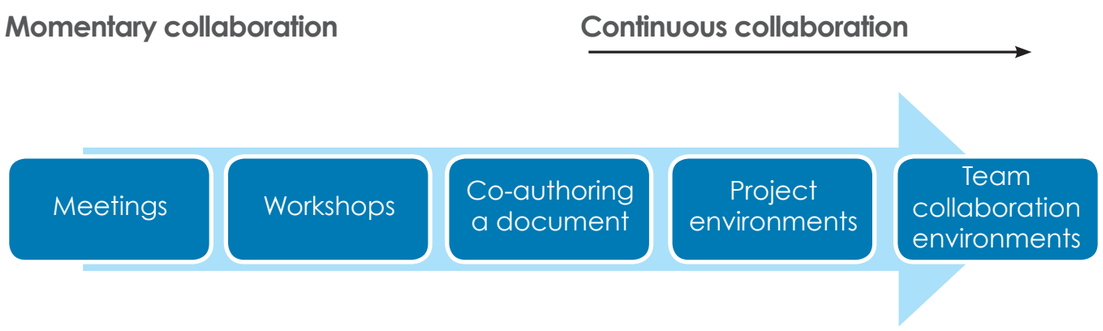
4.2 From momentary to continuous collaboration

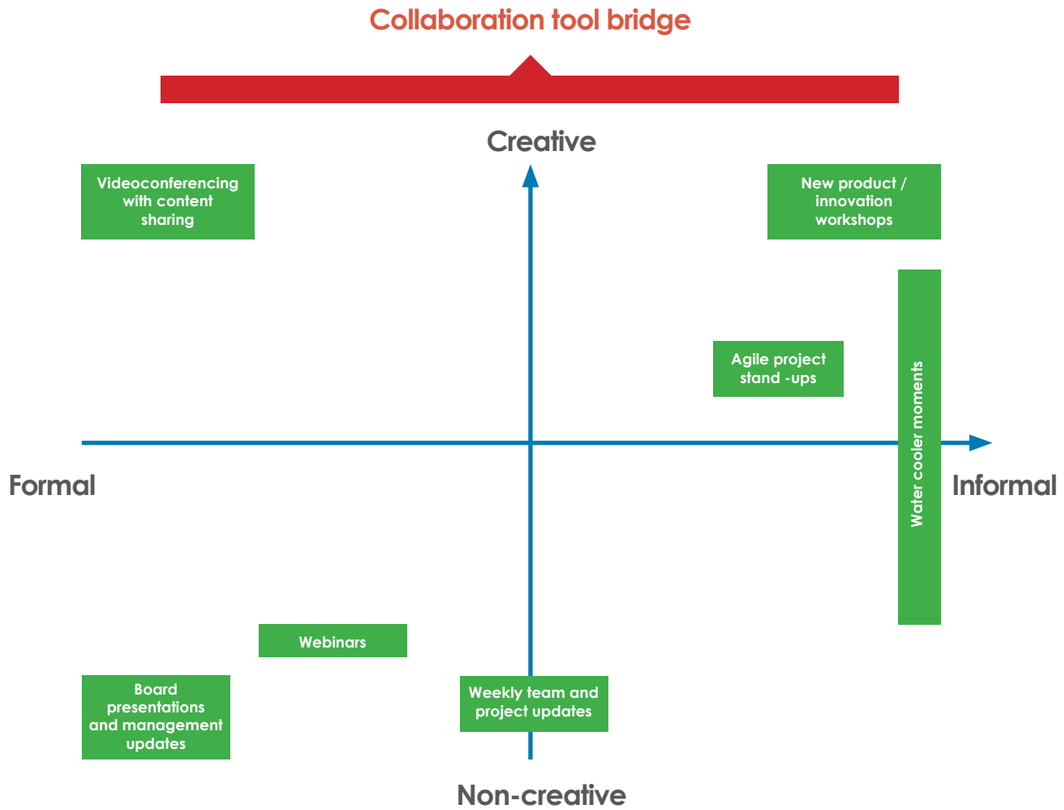
We can understand collaboration by thinking of it on a scale from 'momentary collaboration' – short instances of people coming together face to face or virtually to collaborate for an hour or half a day – to 'continuous', where teams need to work together on an on-going basis. Each of the different points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

In the past, 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 on a defined day. However a shift is underway towards continuous collaboration – allowing project teams to store all of their documents, interactions and ideas in one place, and bridging 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 are typically 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.

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, 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.



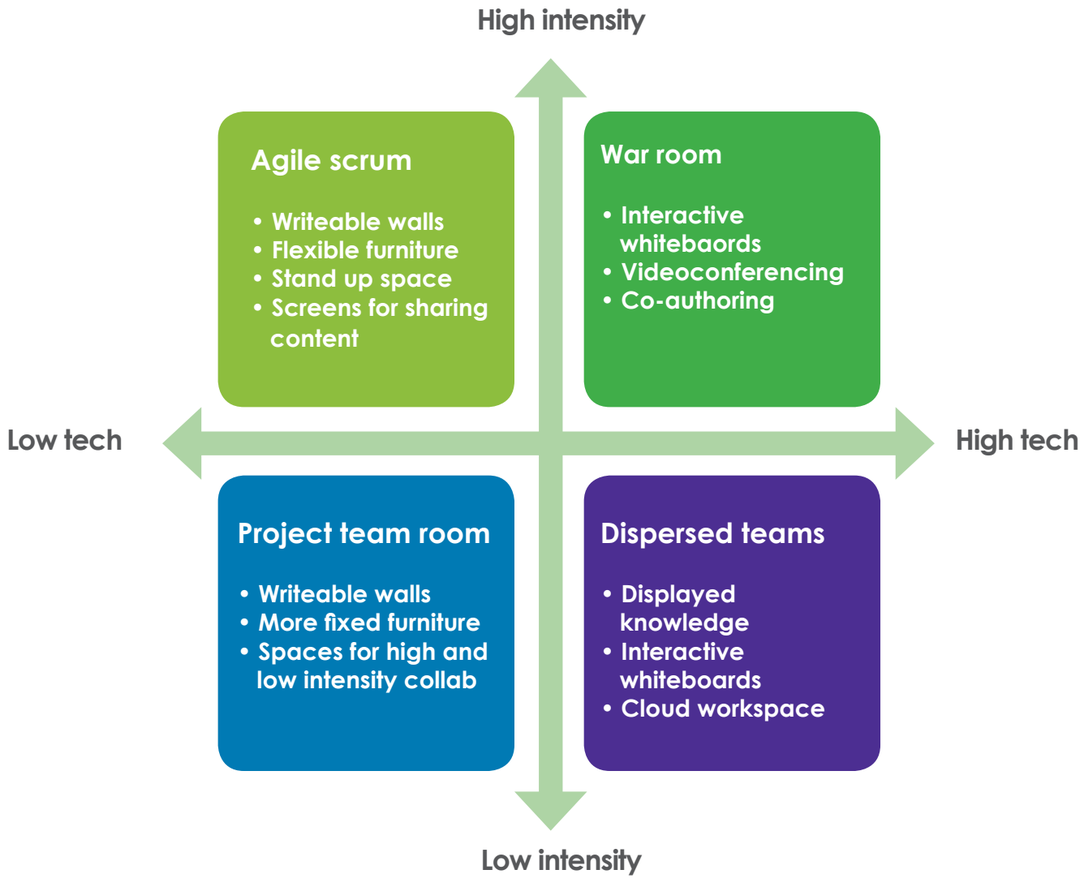


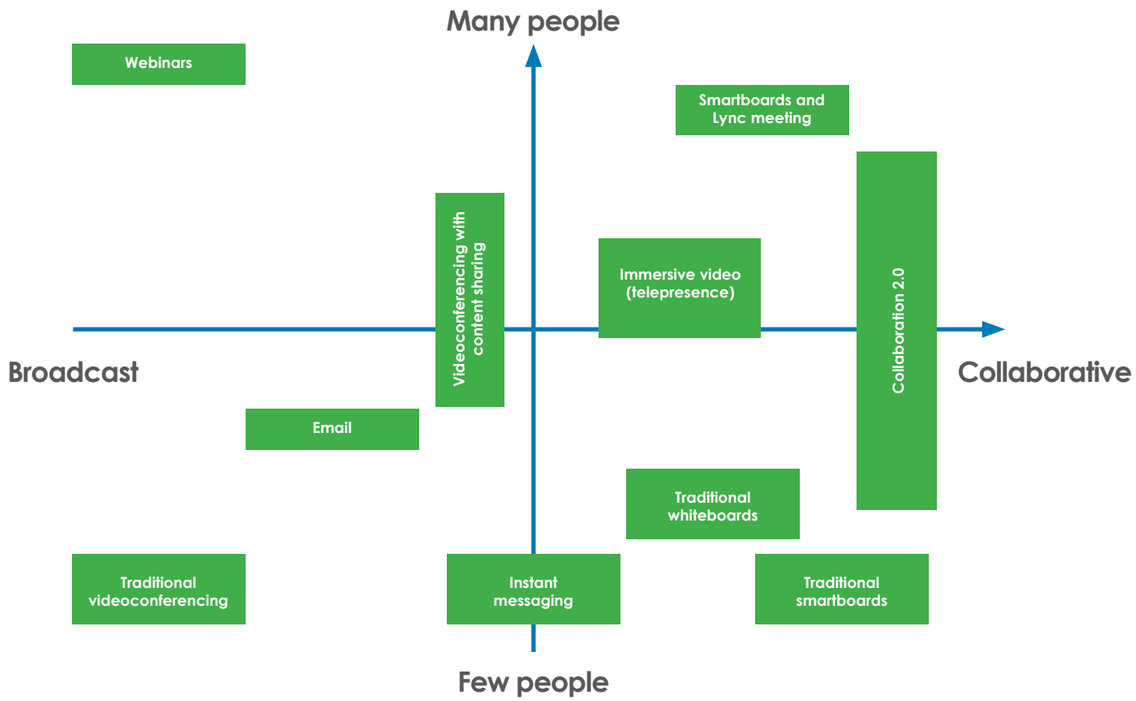
4.3 From generic space to dedicated spaces

Organisations traditionally attempted to accommodate collaborative work within the generic floor-plate of the office. The geographical proximity of colleagues in standard open plan space was seen as reason enough to advance such space plans as suitable for collaboration. Bookable meeting rooms supplemented the endeavour. However open plan areas came to be seen as noisy and distracting, as collaborators disturbed colleagues without being able to focus on the task themselves. Meeting rooms were seen as impersonal and inflexible – and unfit for collaborative purpose.

Now there is a shift towards providing dedicated spaces for collaboration, often termed agile scrums, war rooms, huddle spaces, collaboration zones or project rooms. It is important to make a distinction between high intensity spaces designed to facilitate short, intense bursts of structured collaboration (agile scrums, war rooms) and lower intensity collaboration spaces designed for longer term use, where project teams will occupy the space permanently for the length of the project.

Research from Washington University found that dedicated project rooms that displayed knowledge and process had 'latent memory' –triggering recollections by participants in the process that was undertaken and not just the results or agreed actions recorded. Shown on the next page is a range of dedicated spaces for collaboration across a spectrum from low to high intensity and from low to high tech. 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. It is important to apply the right collaborative tools for each setting and activity.





4.4 From co-located and ad hoc to remote and planned

Traditional patterns of collaboration depended on the collaborators – whether in academia or business – being physical co-located in a single building or space. This intra-company proximity encouraged patterns of collaboration that were often improvisatory and ad hoc, with people pulled away from their day-to-day work at the desk to join meetings and workshops at short notice.

The future of collaboration will entail more remote working with many experts making a contribution from outside the organisation, region or even continent. This will require a much greater level of planning so that different time zones, systems and company protocols can all be successfully negotiated.

Even with the single office building, the rise of smart systems generating data on who is in the building, their location and expertise, will be used to plan and orchestrate patterns of collaboration and interaction more effectively. The smart workplace will be programmed to bring the right people together in the right settings with the right tools to collaborate – as next-generation intelligent Building Management Systems (iBMS), connected over an open Internet Protocol (IP) network, combine with the Internet of Things to turn the entire campus or corporate HQ into a real-time collaborative landscape.

4.5 From single-source and asynchronous to multiple-source and synchronous

In the recent past we have dealt 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. What is happening now is that people are starting to 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.

The five key shifts in collaborative work described here have an important bearing on how innovation-intensive firms specify technologies. 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 the 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.
There is a coherent philosophy that bridges the introduction of new collaboration technologies with legacy knowledge systems. We have a term for the overall approach: Fluid Collaboration.

5. Principles of Fluid Collaboration

Fluid Collaboration has four essential components:

Fluid Space

Fluid Collaboration depends on the provision of dedicated spaces for collaborators to meet and share, physically and virtually. 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 – these will all be part of a range of future 'fluid spaces' for collaborative work.

New typologies of innovation space are likely to emerge over the next five years as the call for collaboration grows, as the need for solo work at the desk diminishes, and as more organisations adopt agile working and Activity Based Working within the office building.

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 level of collaborative work can be enhanced and accelerated.

Fluid Tech

As collaboration patterns shift from intra- to inter-company, from momentary to continuous, from co-located to remote and from ad hoc to planned, more fluid technologies are required to make the new world of collaboration happen. We will see 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.

As employment patterns become more fluid and companies increasingly use more freelances and contractors, this requirement to collaborate outside the traditional IT sphere of the enterprise becomes more pronounced. More companies will adopt cloud computing, which uses a network of remote servers hosted on the Internet to store, manage, and process data, rather than a local server or a personal computer. This will have a profound effect not just on workflow the information management but also on collaboration across distance.

Office buildings devoid of local tech infrastructures will become collaborative spaces for teams, training, mentoring and socialising – they will draw their software and systems from the cloud, and the introduction of new standards such as XMPP will accept networks between companies. 'Buddy lists' will provide presence indicators to show the real-time availability of people both inside and outside the corporation. Teams will be visible (perhaps using a colour-code system known as 'jelly bean working') whether they are physically onsite or distributed and remote.

A key principle behind fluid tech for collaboration is that tools and systems needs to be open, able to work across a range of different applications and platforms.

Fluid Culture

Fluid Collaboration requires a more fluid corporate culture to succeed. In particular, companies need to move beyond a culture of paper processing and paper hoarding to embrace digital flow right across the organisation. Digital flow encourages on-line interaction and real-time co-authoring – activities that require the development of a new code of digital etiquette to be effective.

Change management programmes can be helpful in this instance – they also to allow people to understand and identify new behaviours necessary for successful collaboration. Psychometric tests 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.

The final cultural ingredient for 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. Without a fluid culture underpinning the activity, the best-prepared Fluid Collaboration tools and settings will fail.

Fluid Intelligence

Collaboration tools allow knowledge workers to work creatively together for a common goal – but the fluid intelligence they generate has the potential to offer an additional benefit. Data from unified collaboration platforms will allow people to 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, companies will be able to adapt and 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.

6.Case studies

6.1 MACI Innovation

MACI Innovation is a project management consultancy that has generated a wealth of experience in the development and delivery of large-scale, complex capital investment projects in the aviation, transportation and construction industries.

MACI Innovation approached Avocor with a view to using interactive display technology to enhance process digitisation – the process of moving away from paper and toward web based, real-time sharing of information to ensure improved collaboration.

In an industry where digital device implementation is limited, it was imperative for MACI to choose an interactive display that delivered a familiar interface and applications and above all, is easy to use. With a Windows 10 operating system, the Avocor F series offers users improved functionality as well as opening a world of third party software applications such as Autodesk, Navisworks and Adobe PDF, digitising BIM and CAD drawings.

Simultaneously, the Avocor Intelligent Touch using InGlass™ technology delivers extremely responsive touch and incredibly accurate annotations and enables more productive, smarter working on digital assets, which captures version changes and can be shared virtually, anywhere in the world.

Version control becomes quick and easy, enabling the quick approval of drawings. Companies can also access their own pre-loaded content directly to the display via an OPS PC. The OPS PC (open pluggable specification) conforms to Intel's international standard and will allow cloud based video conferencing applications such as Skype for Business enhancing remote or multi-location communication and collaboration.

Avocor displays are based on an open platform and not locked down to propriety software, so this enables companies to build their own, bespoke collaboration solution based on their own specific needs and requirements. MACI Innovation has now deployed the Avocor F series into its offices and is positioning the solution as a key element in asset digitisation across its construction and design clients. The project is leading to improved productivity in this rapidly advancing industry, and is an example of how fluid tech can rethink collaborative work in even the most traditional of sectors.

6.2 Guildhall School of Music & Drama

The Guildhall School of Music & Drama offers aspiring musicians, actors, stage managers and theatre technicians a creative and stimulating environment in which to develop as artists and professionals. This world-class higher education institution actively promotes innovation, experiment and research.

The Guildhall School recently completed a £90m project to expand its facilities, providing state-of-the-art performance and teaching spaces including: a 608-seat concert hall, a 223-seat theatre, a studio theatre, three major rehearsal rooms, a TV studio suite and numerous teaching and meeting rooms and conferencing facilities to attract the very best teaching faculty and student community.

One of the challenges faced by the School centred on how to create cloud-based, collaborative environments that enhanced teaching and learning.

To address this challenge, technology consultants Generation Digital were engaged to provide programme management and governance to help the School make the right investments based on best-of-breed technology and to move the programme forward.

There were several key project success criteria, specifically:

- Create new revenue streams for the School by building an online learning platform meeting the increased demand from international students
- Enhance meeting and teaching spaces with the best collaborations tools in the market
- Build a solution that both teachers and students will find easy and enjoyable to use
- Limit the need for ongoing capital hardware expenditure by facilitating cloud-based storage.

Central to the solution was interactive, multi-touch 4K display screens deployed from Avocor, ranging from 65" through to 84". One of the core principles of the Avocor solution is that it is an open platform: this enabled Generation Digital to build a bespoke, tailored solution that met the needs to the School.

Powered by Windows 10, the Avocor displays were right for the cloud -based elements of the project, enabling users to access collaboration packages such as Microsoft Office 365 / Skype for Business, Skype, Abode Connect and Google Hangouts straight from the display. The Windows 10 operating system also ensured that users were presented with a familiar interface rather than propriety software platforms that required extensive adoption training.

The wealth of connectivity allows for video conferencing cameras to be added to the solution whilst cloud based web conferencing software enables immersive meeting experiences, virtual online course delivery and large scale webinars, all providing a transformation learning environment to deliver world class digital collaboration for use with business and education. The Guildhall project is an example of Fluid Collaboration at work, combining creative physical environments and a culture of experiment and innovation with carefully chosen collaboration technologies.

7.The Future

This report advances the belief that it is in the combination and integration of collaborative spaces, technologies, cultural approaches and intelligence from data that the future of Fluid Collaboration will emerge.

Fluid Collaboration will enable high-performance teams to deliver better results than ever before. According to a recent *Harvard Business Review* survey of US executives in more than 300 mid to large-sized enterprises, the resounding response was that a new class of collaboration tools is required to keep up with the way that today's digital teams work.

What business managers want, according to the HBR study, are tools that are easier to use, better optimised for connecting with mobile devices and able to simplify collaboration by consolidating the myriad solutions now in place. Work teams are now flatter and more far- flung than ever before (with contractors, partners, consultants and customers involved) – and they form and re-form 'on the fly'.

All of this points to more flexible and fluid solutions in the future. One can even see unified collaboration tools eventually leading to the merging of physical and virtual collaboration spaces. We are beginning to see 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. Meanwhile, the physical spaces in which we collaborate in turn are set to become far more technologically enabled.

Avocor
Natalie Harris-Briggs
natalie.harris-briggs@avocor.co.uk

Worktech Academy
Jeremy Myerson
jeremy.myerson@worktechacademy.com

avocor™

www.avocor.com | +44 (0) 1276 804 654 | info@avocor.co.uk