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Technology, automation and the future of the workplace

The challenges and opportunities of workplace design for an increasingly automated world

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Automation is acting as a global disruptor initiating social, economic and cultural shifts. Rapid changes in technology and working practices pose a challenge, or perhaps presents an opportunity to design more progressive working and living environments. Environments that are capable of automatically adapting and responding to change. From the macro scale of the city down to the office environment, the shift towards a more connected and collaborative approach for humans living and working alongside advanced automated technology will transform the way that we design and interact with the built environment.

Recent advancements in computing power, robotics and artificial intelligence have put us on the brink of a new automation age.

Schwab¹ called this pending era the Fourth Industrial Revolution. The three revolutions that preceded were brought about by the introduction of steam power, electricity and information technology – all innovative technologies that increased productivity and growth globally.

What differentiates this fourth revolution to those previous, is the development of technologies and machines not limited merely to automating routine tasks or performing physical activities.

Techniques such as machine learning, an application of artificial intelligence (AI) that provide systems with the ability to automatically learn and improve from experience without being explicitly programmed, displays the potential of machinery to perform tasks once considered too difficult to automate.

Alarmists see the emergence of highly enhanced computing power and potential for increased automation as synonymous with the prospect of human labour being replaced on an unprecedented scale,² however the likelihood is that job roles will evolve and new more highly skilled roles will emerge.

Automation in the construction industry offers much opportunity for collaborating, designing and manufacturing more efficiently, increasing productivity, while reducing waste and carbon emissions.



Future automation

Effects

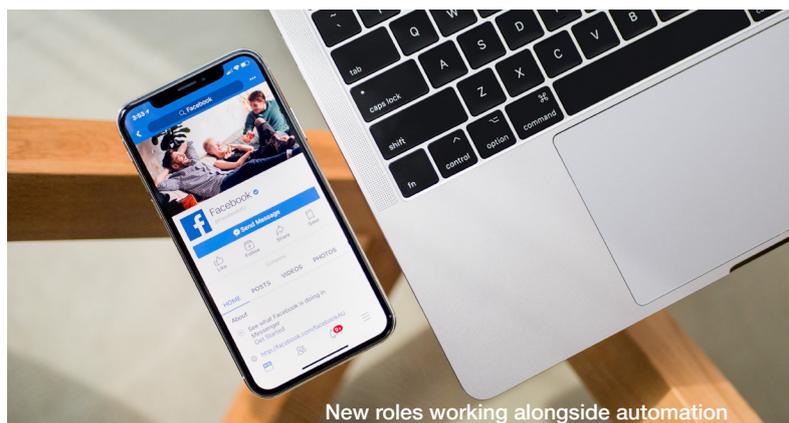
Automation of human labour does not necessarily mean the replacement of jobs, but rather the replacement of tasks. Therefore, whilst certain occupations will of course decline, it is the adjustment of roles that will have a more profound impact. McKinsey Global Institute³ claims that whilst few occupations are completely automatable, 60 percent of all occupations have at least 30 percent technically automatable tasks.

Automation will displace human labour in some instances, it will compliment it in others, and it will also necessitate the establishment of new skilled tasks and roles.

We have begun to see this evolution in businesses and processes that have embraced modern methods of construction and digital design for manufacture.

New roles

While machines are now displaying cognitive capability, the level of this currently fails to match that of human performance. Accordingly, the demand for creativity and expertise along with social and emotional skills will continue to grow within the workforce. It is these traits that will be imperative during the adjustment and creation of working roles. At present, new roles total half a percent of jobs created each year, with recent examples including social media managers, mobile app developers and digital marketing specialists.



New roles working alongside automation

Opportunity

New jobs roles, along with the augmentation of current jobs, will allow people to shift away from physically demanding or tediously repetitive cognitive work and processes. The transition will not be seamless, with risks involved as organisations, individuals and stakeholders adjust. However, history demonstrates that previous revolutions prompted increased levels of education, as well as a positive redeployment of labour, whether that be from agriculture, or more recently manufacturing.⁴

We are beginning to see a re emphasis on digital skills in construction. Training machines to perform labour and time intensive exercises allows for workers to focus efforts on the skilled tasks that demand human sensitivities, creativity, or the application of expertise to make decisions. These human centric tasks provide a more varied and interactive work life, often leading to greater job satisfaction with a more enjoyable working environment and an increased sense of wellbeing.

In accordance to the profound sectoral shifts of employment that preceded it, the fourth industrial revolution has the capability to boost productivity and income levels globally, whilst enhancing the quality of life for society as a whole. It is this productivity growth previously that has steadily reduced the average working week by over 40 percent in the past century,⁵ demonstrating fewer working shifts, paid holidays and the surge in part time work.

The productivity growth provided by automation not only offers the opportunity to increase service provided, but also the opportunity of flexibility for workers, and subsequently a better work / life balance.



As the world of work is reshaped, spurred on by the advancement of digital technologies, it is imperative that the way we design, build, operate and maintain our working and living environments also evolves – from the scale of the city to the office. Whilst we cannot foresee future changes in behaviour and culture with any great certainty, it is important to try and understand the implications of technological advancements upon our future work and living environments.

Workplace design for future job roles

It is a crucial time for workplace design, during which significant changes are already occurring in preparation to accommodate the next generation's workforce. New typologies of collaborative workspaces like WeWork have grown quickly and now occupy large spaces across many of our cities. Automation is causing a shift of the working dynamic towards increasingly agile and flexible working patterns. This calls for a more varied range of flexible and task specific workspaces designed to offer staff choice and autonomy over their working environment.

The standard open plan format that has dominated office design for the past century will likely suffer the same fate as the isolated cubicle farms that preceded it. With the automation of many secretarial, clerical and accounting type roles, the workplace requires fewer static workstations and desks.

Smart devices, accessible Wi-Fi spots, email and remote video conferencing are enabling remote working opportunities that reduce the requirement of a fixed workspace. The office of the future must be prepared to be redefined as a place where people come together to share and develop ideas, rather than the 'workhouse' of yesteryear.



Modern workspace

An inventive workplace

Research supports that well designed workspaces can improve performance, innovation and creativity, whilst also building a healthy environment for workers. Positive office design, which can be achieved through factors such as sociability, good lighting and environmental conditions, has the potential to make employees up to 33 percent happier at work.⁶ Logically,

employees that are also happy in their workplace surroundings experience 31 percent higher productivity.⁷

Workspaces that are comfortable and conducive to thinking and performing tasks effectively will be an expectation of modern employees in their new or adjusted roles. This already greatly affects staff retention levels, with 48 percent of employees believing the design of their workplace has a significant impact on their decision to stay with a company.⁸

The introduction of novel, playful and innovative features within an office to boost creativity and smart thinking should be embraced. Innovative workplaces shake things up. As a result, employees in these environments adapt the same attitude. This smart thinking is what all future offices should strive to conjure, after all, as Heppell describes,

“we have computers to do the ‘dumb’ thinking for us. What else is left?”⁹



Adaptable

With the rapid evolution of how individuals and companies work – owing to the advancement of digital technologies – workplace interiors need to be strategically designed with the capability to be adapted quickly and at relatively low cost. The office must become fluid, with movable elements to help future proof it against changes in technology, working practices and behaviours.

These create adaptable spaces that can be reconfigured to suit various working styles, quickly and cost effectively. The design of spaces to be multifunctional and dynamic is also a must, for example kitchen areas that have the potential to be designed to become an additional meeting space whilst not in use, demonstrated in Figure 1.

An efficient office is engineered to remove wasted floor space. The use of mobile technology allows employees to work away from the static work desk and utilise previously unusable space that would be otherwise vacant. With flexible and modern furniture, these areas can be configured to create open, semi open or enclosed spaces that act as privacy booths, meeting spaces or areas for video conferencing.



Figure 1: Multifunctional spaces are key for an efficient office

Co work

The advancement of wireless technology has made it easier for teams to communicate and transfer data. However, it is recognised that this cannot always replace face to face interactions and being in the presence of other knowledge workers, which is known to stimulate creativity and innovation, creating greater social interaction and strengthening the business' culture. This is possible in co working spaces, a strength of which is their multidisciplinary make up, creating an environment where individuals from different fields, teams and sectors can work together, yet independently, side by side, in an informal and collaborative space.

This approach increases the cognitive diversity and in turn opportunities for knowledge sharing and collaboration. Creating areas that can accommodate small teams working together and allow for different departments to bounce ideas off each other, rather than working alone to solve problems, is the aim.

The shift towards more mobility in the workplace will mean that offices must evolve to accommodate collaborative work done on the go and provide unassigned spaces rather than allocated desks for each individual. For larger organisations,

offices can become a series of locations for employees to work, based upon convenience, function and comfort.

Osgerby¹⁰ describes the future office as a place where people “come together to have moments of intimacy and sociability” and a “meeting place”. Co working spaces allow for autonomy and mobility for employees whilst integrating a sense of community and reducing isolation during remote working.

Mixed use

The office of the future will require a mix of workspaces and types to accommodate the next generation of workers. A combination of open plan, semi private and enclosed spaces can provide flexibility and choice to suit workers’ needs, such as co working and collaboration, socialising, research and the time and space to think. Layouts can then incorporate a mix of acoustic pods, breakout areas, meeting rooms, lounges and brainstorming areas to accommodate these needs, rather than rigid and expansive rows of desks.

With the line between work and living spaces becoming increasingly blurred, mixed use areas can provide an element of comfort and flexibility for workers, without the formality and pressure of the traditional office.

The importance of mental health in the workplace and the realisation of downtime playing a pivotal part of the creative process also calls for a rethink of the typical breakout space. Providing the physical spaces that allow people time out for contemplation, retreat and exercise within the work landscape is vital for the wellbeing of workers.





Figure 2: The office is a space for sociality, as well as work

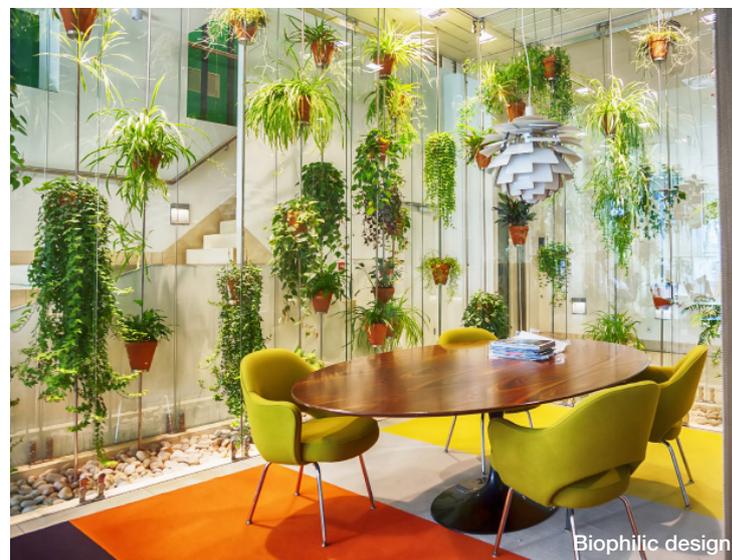
The agility and flexibility of future job roles and working patterns calls for multipurpose office buildings to become default, with unused space outsourced and single use space to have multiple purposes. Mixing work with other uses in a building can provide the spaces required to enhance employees' working life and wellbeing, such as gyms and social spaces as in Figure 2, whilst allowing for them to connect informally with others in and around the building.

Wellbeing

As technology and automation reshape workplace practice globally, the cultural shift will cultivate wellbeing in the workplace. The importance of wellbeing at work will see less emphasis on measures such as occupant density and targets, and more on worker and workplace experience. The physical and mental health of workers is crucial to how productive and creative a workforce is, which will lead to the continued blurring of boundaries between the workplace, social and hospitality environments.

Through good design, the negative aspects of current day offices can be overcome – noise, alienation, poor lighting and environmental conditions, the feeling of being a small cog in a large machine. As we move forwards into an increasingly digital world, buildings that react and respond to the people within them with data driven solutions will be critical to the workplace and wellbeing experience.

The building itself has a critical role to play here, as does creating a workplace where people are encouraged to be active, interact, collaborate and share knowledge. A study suggests that the ideal sit to stand ratio is 1:3, or two hours of sitting and six hours of standing in an eight hour workday.¹¹ This could be achieved through increased use of innovative furniture such as standing desks. Along with this, the deprivation of natural elements due to being inside for long periods of time can be overcome with an increased connection to nature. Through the addition of plants and other biophilic elements productivity and cognition can be boosted by 15 percent.¹² The benefits of biophilic design to the future workplace are significant and research has clearly linked biophilic design with workplace productivity and wellbeing.



Biophilic design

The one size fits all approach of office design of the past will not be sufficient for the next generation of workers who will require agility within the workspace for their dynamic and flexible working patterns. Whilst there is an increasing demand to equip staff with the ability to work remotely, the importance of face to face interaction will always be there, and the design of offices should increasingly cater for this.

It is key that people are put at the centre of design and decision making. The office of the past was built for working, not for workers. Generational culture shifts, changing behaviours and the advancement of technologies now gives us the opportunity for this paradigm to be flipped.

With people then at the heart of building design, exciting, collaborative, healthy and productive environments can be created so that workers can thrive physically, mentally and professionally in a world of constant change and ever advancing technology.

Going forward, the office building as a whole must be thought about as a universal space, with an anticipation for refurbishment or change in 5, 10 or 50 years' time. Legislation needs to then be pushed to allow for flexibility of the usage class of a building, whilst the design must incorporate retainable components.



It is paramount that these universal, mixed use spaces keep their relationship with their context, and avoid becoming fortresses separated from the city. This will be achieved by continuing to learn from the co working model, understanding the key principles of building communities within a building and studying how tenants can interact, share and work together.

We would love to hear from you if you are interested in collaborating.



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