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Source quotes: WORKTECH Academy

1 Introduction

The office building in the 20th century was essentially shaped by the emergence of a group of industrial technologies – including the elevator, HVAC, communication, and IT infrastructure.

Today, a host of new digital technologies is radically redefining our workplaces – how they are built, how they operate, and how they support working life.

Digitalization is transforming the future of work and opening the door to a new generation of smart office buildings. But how can they be planned, designed, built, and operated so that all the key players in the real estate chain benefit?

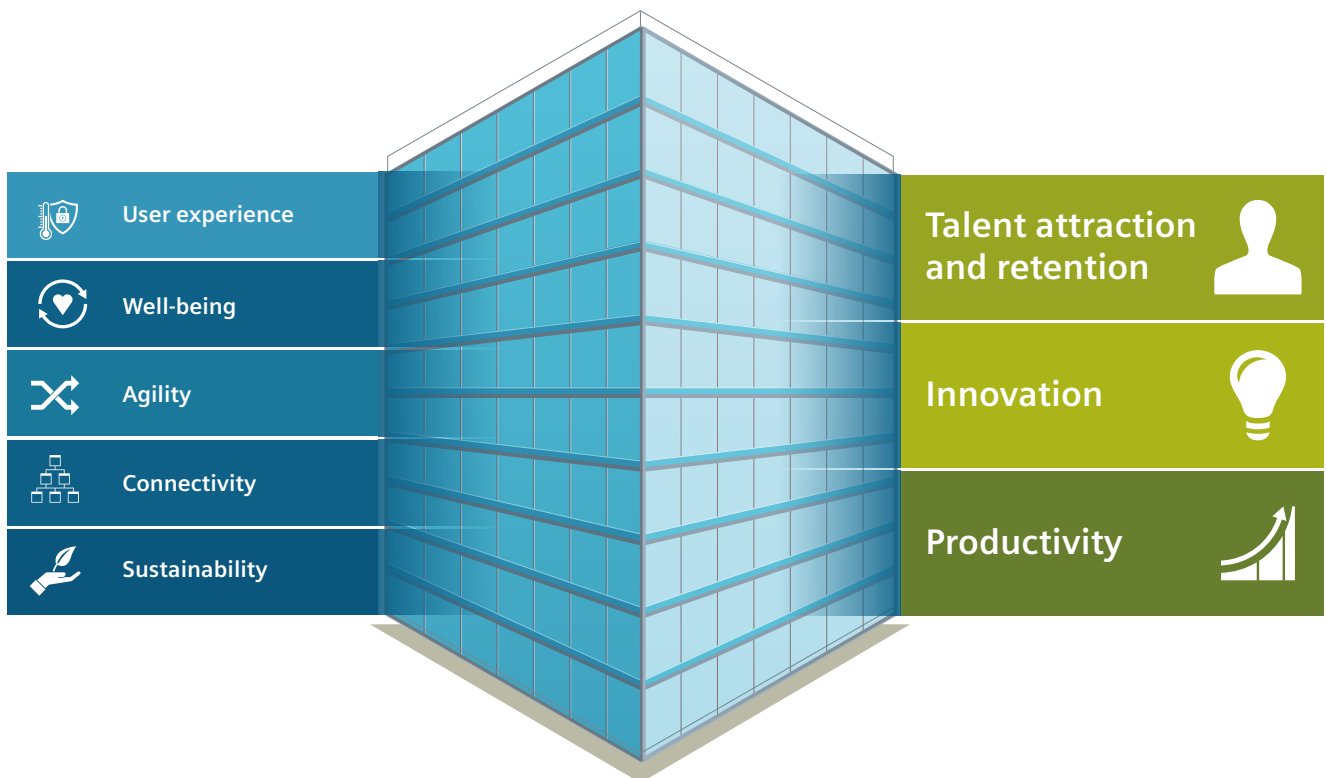
How can investors and owners create value and get the best return on investment? How can facility managers and operators optimize use of space and resources, and make informed decisions to achieve efficiencies across an entire portfolio of buildings? How can tenants and occupiers who work in these buildings enjoy the best services and experiences? And how can architects and planners deliver more forward-thinking solutions?

This white paper, written by Siemens Building Technologies in association with WORKTECH Academy, sets out the emerging landscape of the smart office.

It explores global trends around the future of work and workplace, looking at how the composition of the workforce, patterns of work, and attitudes to work are all changing inside office buildings.

It sets out a series of scenarios to show how new data-driven digital services, which improve experience, well-being, agility, connectivity, and sustainability in the workplace, can deliver value – by creating smart offices that support talent attraction and retention, innovation, and productivity.

The report concludes with a summary of Siemens’ commitment to further develop the office market by deploying its people-, technology-, and service-centric approach. By doing so, it extends the possibilities of the future smart office and bring its key attributes and experiences a level higher.



2 The context for a new workplace

Global shifts in work and workplace are now challenging fundamental assumptions about the way office buildings have been planned, designed, built, occupied, and experienced in the recent past.

As smart building technologies emerge with the potential to catalyze new processes, behaviors, and outcomes at work, three essential questions come to the fore. Who will work in offices in the future? What type of work will they do? And what they expect about their workplace?

Trends drawn from WORKTECH Academy's global network of contributors give some indication of the changes ahead.

The future workforce

Globally, workforces are set to change in response to demographic evolution and economic and technological challenges. The workforce is currently a company's biggest asset, accounting for around 90 percent of operating costs in most organizations, and this is unlikely to change in the near future. Understanding its organization, needs, and expectations is therefore essential.

The office-based workforce is set to feature a wider generational span than ever before, comprise more part-time and project-based workers, and be augmented by AI (Artificial Intelligence) and robots.

Much of the current focus is on the specific demands of millennials, who will make up three-quarters of the workforce by 2030 according to Forbes magazine, and on new Generation Z entrants who will be the most digitally savvy workers. However, older workers will remain in the workforce for longer due to pension shortfalls and efforts by companies to avoid a "brain drain" of key expertise. So office buildings will need to address ergonomic, environmental, and technology needs across all generations.

The workforces inside these office buildings will no longer comprise mainly full-time employees of the host organization. They will include far more freelancers, part-timers, and consultants as well as external partners, suppliers, and collaborators. As the contingent, on-demand workforce grows and the traditional corporate job pool shrinks, this model is described in some publications as the "gig economy." People will be hired in on the basis of specific skills rather than given permanent roles.

In this context, issues of security, access control, fire safety, wayfinding, and networking with colleagues will be paramount in the post-hierarchical offices of the future, in which people are no longer confined to rigid departments. "Frictionless" connectivity and integration of services will be required to bring the more disparate strands of this new workforce together.

"Enterprise software robots will update client profiles, report on compliance issues, process insurance claims, or complete other tasks with minimal human intervention."

Peter Miscovich, JLL North America

Human labor will be joined by AI and robotic assistants, intelligently designed to make the workforce more efficient. Many transactional jobs and chores will be automated, freeing up employees from routine tasks (imagine an office chatbot booking meetings and taxis, for example) to concentrate on performing more creative, collaborative, and transformational work. In this context, the office building will be required to accommodate a different type of deeper work as an arena for collaboration and innovation.

Evolving patterns of work

What type of work will people do in the workplaces of the future? Within a global knowledge economy, work will become increasingly distributed, flexible, and mobile; and the office will no longer have a captive audience. Office buildings will therefore need to become destinations of choice, with compelling reasons for making a visit.

"The challenge is to turn the office into a destination – somewhere that people want to go."

Erol Aziz, KPMG London

Already there is a growing service-oriented emphasis on amenities, comfort, and hospitality in the global workplace to improve the experience. Just as shopping centers promote themselves as destinations to attract customers who would otherwise shop online, offices will do the same to attract employees. This approach will include offering concierge, retail, health, and fitness services, making life easier for those who commute to the office, as well as providing better food and drink, and livelier spaces for work and socializing.

As new technologies automate routine tasks, there will be growing emphasis on supporting creative knowledge work that promotes innovation. Patterns of collaboration and interaction within the office building will come under much closer scrutiny as companies seek to create coworking, accelerator, and incubator-style spaces in-house and avoid taking innovation activities off-site, as many do currently.

The traditional workplace model of people being tethered to a fixed point for long hours within the office building is in retreat: Agile working practices, which expand working life beyond the desk into a series of shared, learning, and social spaces to foster collaboration and innovation, are set to rise. In particular, the agile “scrums,” which are a feature of the tech sector, will become more prominent now that everyone is in a race for premium talent, whether they are a bank, a law firm, or a tech firm.

“Large companies everywhere are under pressure to reimagine how they might reorganize their real estate portfolio to make things better for customers, staff, and communities...”

Dr. Klaus Sandbiller, Head of Corporate Real Estate, Unicredit Italy

Organizations generally will look to manage and measure space in a more optimal way amid changing patterns of work, with a sharper focus on raising productivity. Traditionally, companies have lacked the instruments to measure performance in office buildings and productivity has been sluggish, especially since the financial crash of 2008. In a bid to regain momentum, organizations are now looking to invest in productivity solutions through training, infrastructure, and new technologies.

Changing attitudes to work

As the workforce itself changes, and the work being done in offices becomes more fluid and dynamic, how will people feel about the workplace? The emergence of new attitudes and behaviors in the workplace marks a third paradigm shift. As organizations compete globally for the top talent, there will be a greater focus on the employee experience, and on the health and well-being of people in office buildings.

This focus will encompass both physical and mental health, to reduce stress, depression, burnout, and anxiety. Even greater than today in the future there will be a general drive toward more holistic policies in which furniture, settings, technology, culture, circulation, communication, nutrition, and exercise are all thoroughly considered. Work/life blend rather than work/life balance will be the aim for most people, as they use common digital platforms for work and life.

Many employees will also have greater expectations of their companies in terms of addressing wider global and societal challenges, and they will judge future employers on how well they behave in terms of corporate social responsibility. In the context of recruiting and retaining the best talent, companies will be required to be transparent and demonstrate action on the ground toward solving society's problems. This is particularly in relation to sustainability, as office buildings of tomorrow become attached to smart grids and are part of smart cities.

“Companies with great employee experience, scoring in the top 25 percent, are twice as innovative as those in the bottom quartile.”

Caroline Burns, Workplace Revolution, Singapore

The drivers of smart offices

Against this background of change in the global workplace, with an evolving workforce, new patterns of work, and different work styles, a new type of digitally driven office building is taking shape that responds to the challenges of the next-decades workplace.

Smart offices have developed progressively, from a primary focus on managing costs through managing environmental impact, to managing the entire user experience in the workplace. But what could the next generation of these smart buildings offer to key stakeholders in the corporate real estate chain?

For investors, there is a primary imperative to *create value* – to make the right decisions to ensure a good return on investment. This means developing reliable and successful buildings that increase in value, rent out more quickly, yield a higher rent, and attract better quality tenants, while complying with all standards and regulations.

Being able to directly address the needs and aspirations of the workforce, and the ways in which patterns of work and attitudes to the workplace are changing, is essential to investing in and owning office buildings that are attractive in the long term and benefit from a good market reputation. Optimizing value across a portfolio of office properties is also an important consideration.

Facility managers and operators want to *achieve efficiency* – to optimize the building's operational performance. This means having better control over building costs and resources, having more insight into building occupancy patterns, and for IT managers in particular, being able to operate a secure, high-performance network.

For tenants and occupiers, there is a primary imperative to *enhance the experience* – to create a healthy, safe, welcoming, and productive environment that acts as a magnet to attract and retain staff. This means providing a building that will host higher levels of amenity and well-being – a building in which connectivity is seamless and frictionless.

For architects and planners, there is a primary imperative to *deliver innovative solutions* – to plan and execute office projects in the most cost-effective and goal-oriented way to meet business and operational objectives. This means being able to model digitally and pilot changes before building.

A global movement

All of these demands in the corporate real estate chain can be met by the next generation of smart office technologies. Already the smart office trend is emerging as a global movement, with exciting examples of new practice in different parts of the world. What is interesting is the way in which different factors have influenced developments in different regions.

In the Asia-Pacific region, for example, the sustainability agenda and the rise of green building standards have driven many new projects, especially in Australia and New Zealand. In European centers such as Paris and Amsterdam, meanwhile, agile and connected smart buildings have emerged to address the talent agenda.

“I am convinced that our modern, efficient, and flexible buildings help make us attractive for new talent.”

Sandra Klein, Marketing Manager,
DB Schenker AG, Essen, Germany

Middle Eastern schemes such as those in Abu Dhabi feature smart building facades to manage energy costs in a harsh, hot climate, whereas in North America, a growing focus on user experience, community, and well-being – influenced by the Well Building Standard – is driving new thinking in the field. Prestigious office projects with an integrated digital strategy that mixes workspace with retail, hospitality, and residential are emerging. More and more well-known, reputable, and successful companies relocate their offices to “go smart.”

“The office of the future is not a place where people come just to do work. It’s a place to make personal connections... We wanted to create a significantly higher level of unplanned collisions to transform our office culture.”

Ross Love, Managing Partner at
Boston Consulting Group, New York

In the next section, we discuss how fast-developing smart building technologies might address the main challenges of the workplaces of the upcoming decades.

3 Scenarios for the office of tomorrow

Review of emerging trends in the global workplace suggests that organizations now face three central and generic challenges: first, to attract and retain the right talent; second, to create the right conditions for innovation; and third, to improve levels of productivity.

Smart technologies have been championed as a direct solution to address these three essential human challenges in the workplace, but the technology is unlikely to achieve these goals all on its own. Transformational change of this order has the best opportunity to be realized through the interaction of people with an entirely different type of office building.

Getting the right talent, innovation, and productivity in the workplace of the future will increasingly depend on creating offices that offer a better experience and are more geared to well-being, more connected, more agile, and more sustainable. These are the five key values we believe that smart office technologies are set to deliver – and here are some scenarios of how they might be achieved.

Experience: paramount for the user

Smart building technologies have the potential to improve the experience at work for office users – to enable people to feel safe, secure, and comfortable, in control of their environment, and able to find the right spaces, support, and colleagues when they need them.

Just imagine having smart services to help you decide the best route and mode of transport to work, to order your coffee just how you like it ahead of your arrival, and to connect you to other people in the building who might make a useful contribution to the projects you are currently working on.

Work is frictionless and all interactions are made easy within the smart office building of the future – an aspect especially demanded by millennials. The quality of experience makes people want to spend time in the office, not see attendance simply as required. The workplace app on your smartphone integrates with the building and tailors it to your requirements.

The building automatically knows who you are and can help with a wide range of work tasks, automating mundane chores such as food, room, or desk booking to leave you free to concentrate on more creative knowledge work. Its autonomous systems engineer “serendipitous encounters” designed to help you innovate.

Settings automatically adapt to your preferences as you enter a space in terms of lighting, temperature, and working style. Prefer to work standing up? Prefer the blinds to be lowered? The setup automatically adapts to your needs. Collaborating with colleagues from several different countries in a remote meeting? Auto-translate systems ensure that nothing is lost in translation.

Smart systems for fire safety, access control, video surveillance, and visitor and identity management are fully integrated, giving you peace of mind and enabling your facility manager to monitor all building functions on one visual dashboard. Your visitors will no longer be forced to queue up at the reception desk, sign a scrap of paper, and wear a plastic lanyard. The smart building will know who your clients, contractors, and suppliers are. “Meet and greet” at reception will be revolutionized.

Visitors will receive a “boarding pass” in advance of any meeting, giving them access to the building with a bar code on their smartphone, just like airline check-in. Sensor networks will recognize people via their wearable device or smartphone, sending personalized messages or pointing out corporate artworks in reception, advising on the best route through the building, or communicating salient facts about the company. The type of curated experience that smart technologies enable can also be keyed into a company’s brand values and culture.

“With technology you can use personalized augmented reality to increase the attractiveness of a destination.”

Paul Edwards, Mirvac, Australia

Well-being: essential to retaining talent

Smart building technologies have the potential to promote and support better health and well-being in the workplace, creating a more alert, engaged, and energized workforce right across the demographic span.

Already, the application of sensors in the environment to monitor indoor air and water quality, light, temperature and noise levels is set to have a positive impact. Research studies have shown that poor air quality and low levels of natural light penetration have an adverse effect on concentration and productivity.

Now imagine all the fitness devices worn by employees sending biometric data to the smart building system, which adjusts ambient conditions autonomously on data readings that suggest that the occupants of the office are generally feeling too hot or too anxious.

The calorie count from food and drink consumed at work, and number of steps taken, could be automatically fed into a database for each employee – to be reviewed with your line manager as part of the appraisal process to ensure that fitness goals are met.

These ideas related to improving employee health brush up against privacy and data protection issues. But the millennial generation appears more willing to give up its data to outside parties than any generation before. Six out of ten millennials leave their employer in less than three years, a phenomenon that has been described as the “quarter-life crisis.” A healthier workplace could help them stay longer.

Agility: a must-have for the organization

Digital technologies have the potential to make the office building more agile and flexible, as data collected from thousands of data points give facility managers the real-time intelligence to reconfigure and adapt space to optimize use and address changing user needs.

Data collected from smartphones, wearables, location beacons, and sensors inside the building will show you who else is in the office at any given time and where they are. This gives tenants a platform to work and interact with one another in new ways. Sensors and video analytics will not only know where you are, they will know how you are working. If you prefer working in collaborative spaces, the system can show available spaces to work, or for private meetings it will show the availability of quiet spaces.

Data-driven services will allow the building to adapt to the demands of the workforce and to changing work styles. Architects and planners will be able to model new spatial scenarios digitally to assess impact and costs before any built intervention. Employees will be freed from the constraints of building opening times.

People will be able to schedule a request for the hours they wish to work, the building will know exactly who that worker is, and will grant them access to the building. This flexibility is important for millennials, a quarter of whom are working over 50 hours a week.

“Across the global cities, we have seen overall growth of 18 percent in the number of flexible workspaces over the last 12 months...”

Ben Munn, The Instant Group

Connectivity: a reliable way to leverage digitalization

Smart office buildings of the future have the potential to bring greater connectivity to the workplace, which can be managed more efficiently. Collaborative patterns of work become more fluid and can be coordinated more effectively.

As demographic change brings a younger, more entitled and more digitally comfortable generation to the fore, millennials will expect their environment to be seamlessly connected. They will walk into any office within their organization's building portfolio and automatically be connected to the network. There will be no barriers when trying to connect internally or externally. Connectivity will link the workplace to the world around it, integrating data on who is in the building with weather forecasts and real-time traffic information to ensure a smoother commute home.

Collaborative work that is increasingly intercompany, planned, and remote rather than intracompany, ad hoc, and face-to-face will be supported by superconnected, plug-and-play communication technologies. And an entire portfolio of office buildings will be managed and serviced remotely from one centralized point.

Cloud-based, customizable, and scalable solutions will extend from a single facility to an entire real estate portfolio, with managers, owners, and investors able to compare the performance of different buildings in the portfolio in a single visual dashboard. Such transparency will enable benchmarking of building performance and deliver metrics that will allow the operator to make informed decisions.

Sustainability: at the heart of the company agenda

Smart office buildings of the future will be more sustainable than ever before, lessening environmental impact, reducing energy costs, and supporting the corporate social responsibility agenda.

Energy consumption will be managed by automatically responding to occupancy and utilization in the building. Tenants will work in buildings that are capable of producing and storing their own energy and even sell it back to the grid. Furthermore, the company can, if needed, purchase energy at the lowest price using smart optimization systems. Real-time data points will monitor carbon dioxide levels and energy consumption in the building, providing actionable intelligence. In hotter climates, smart facades and shading systems will counter the effects of extreme weather.

Office buildings consume a growing proportion of total energy used in developed economies. So the forward-thinking investor will want to develop buildings that not only use minimal energy but also have the potential to be entirely self-sufficient. Image-conscious millennials will want to walk into a smart office confident that their organization is contributing to a greener future and demonstrating sustainable values in corporate reporting.

In addition, the rise of electric cars as a new mode of commuting to work will impact energy use in office buildings as vehicle batteries are charged on-site. Energy loads will need to be managed as this transport technology develops.

Raising awareness

Sustainability was the main driver for the first wave of smart buildings. In the future, it will continue to be as important as ever as a key foundation of the digital workplace, alongside the desirable features for a better experience and greater well-being, agility, and connectivity. However, there is still work to do in terms of awareness in the market. According to a survey by real estate developer British Land, 96 percent of corporate office property decision-makers in London are aware of smart buildings, but nearly a quarter say they don't know enough about them.

In the next section, we discuss the benefits of the smart office building for the different stakeholders in the real estate chain.

4 The benefits of the smart office

By properly leveraging the potential of digitalization, the smart office of the future can achieve the highest levels of performance throughout the entire lifecycle of the building. In doing so, it can meet the different expectations of all users, from investors, owners, and facility managers to tenants and employees.



An enhanced experience

The benefits of *creating a better experience* at work for owners and investors are in developing office buildings that increase in value in the long term because they are easier to rent out, they command premium rents, and attract high-quality tenants. For facility managers and operators, the benefits are in being able to customize the experience for different people and optimize space efficiently to meet user needs. Tenants and occupiers benefit by having the ability to retain and attract staff through the provision of superior amenities and services that help to build the corporate brand and underpin company culture.



An environment that radiates well-being

Benefits of *generating greater well-being* at work are in developing office buildings that people really want to work in. A positive image around health makes facilities rent out more quickly, rent at a higher rate, and create long-term value; standards like the Well Building enhance salability. Facility managers and operators can analyze occupancy data in real time to be able to tailor the environment to the physical and emotional needs of the occupiers. For tenants and occupiers, the benefits are in being able to support greater creativity and productivity through a fitter and more alert, engaged, and energized workforce.



Opportunity through agility

Developing a building that is *more agile and flexible*, that can stay open longer and address collaborative patterns of work, creates more value for owners by being an attractive proposition to innovation-oriented occupiers. Facility managers and operators have actionable intelligence available to support more informed decision-making and improve business efficiency. Tenants and occupiers are able to find the right spaces and setting to suit their more flexible working style, aiding collaboration and innovation. Architects and planners can simulate different spatial scenarios on the office floor so that the reconfiguring and optimization of space use is based on real-world evidence.



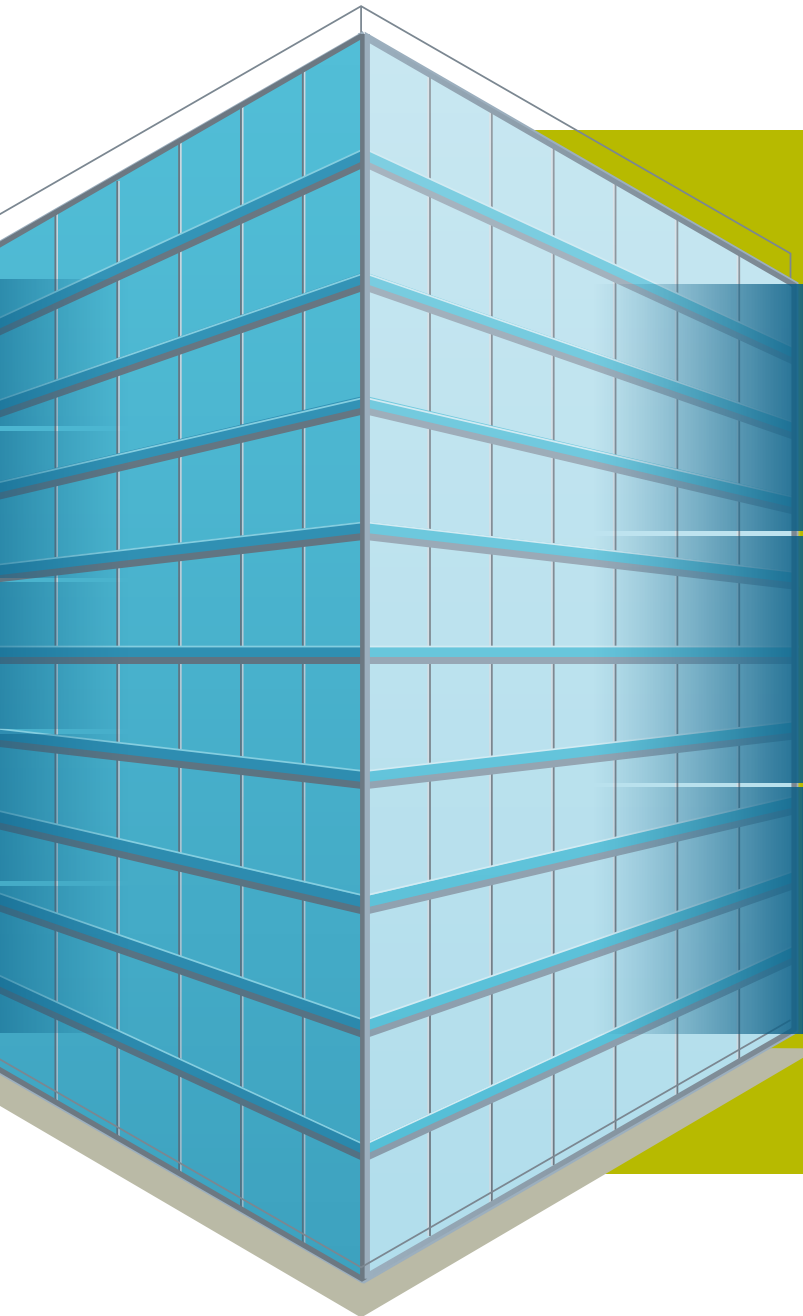
Connectivity secures frictionless work

The benefits of *greater connectivity* in office buildings for the owner and investor extend from creating a better tenant experience and satisfaction to achieving efficiencies at scale, as an entire portfolio of buildings are managed remotely from a central point and their relative performance is assessed. Facility managers and operators similarly enjoy a panoramic view across the entire portfolio and can harness data to improve efficiency, while IT managers can run a secure and reliable network. Tenants and occupiers can work on demand by seamlessly connecting to networks in any smart building owned by their organization, improving experience and productivity. Building users will no longer be tied to their workplace, thanks to secure networks and smart technologies enabling frictionless remote and on-site working. Architects and planners have the tools to model digitally to assess changes to the building ahead of any built intervention.



Achieving the highest sustainability standards

The value-added benefits of owning and investing in greener buildings include higher attraction rates to the building – especially with the rise of the millennial generation – as well as higher rent yields and better resale value. The facility management and operational benefit is in making substantial savings on energy consumption. Green buildings will provide full transparency on energy costs across an entire portfolio. Property managers can use this data to draw comparisons throughout a large range of buildings, enabling them to optimize energy efficiency. Tenants and occupiers benefit from working in an environment that not only addresses their environmental needs but also demonstrates good global citizenship.



Talent attraction and retention



Innovation



Productivity

Creating the right conditions

It is in a profound interweaving of experience, well-being, agility, connectivity, and sustainability that the smart office of the future will create the conditions that will draw in the right talent, make innovation happen, and boost productivity. Around the world, leading organizations will no longer be driven by just one or two factors (the talent agenda or sustainability, for example) as they develop new smart buildings, but by all of them in a complex set of interrelationships.

It is likely therefore that regional variances in the character of the smart offices we have seen to date will be gradually replaced by a more homogenous, global, big-picture approach embracing the many benefits offered. For this to happen, a more integrated, open, and deep approach will be required to deliver the digital buildings that will transform future working life. In the next section, we conclude with a look at Siemens Building Technologies' commitment in this area.

5 Why Siemens as the partner of choice for smart office building technologies?

The global market for office buildings is moving fast from a facility-oriented approach to a user-centric one. In considering this, Siemens Building Technologies is committed to bringing people, technology, and services together to add value for owners and investors, achieve efficiency for facility managers and operators, enhance satisfaction for tenants and occupiers, and help architects and planners to deliver innovative solutions.

Siemens recognizes both the traditional limitations of office buildings – their inefficiencies, lack of comfort, and control, disconnections, and productivity issues – and the opportunities that digital services can bring. The company is a pioneer in the smart building field with proven expertise; it has made a serious investment in the digitalization agenda for buildings (in terms of both their construction and operation); and it has solutions and systems that consider the whole lifecycle of the building and how it will evolve over time. Siemens is also committed to becoming carbon-neutral by 2030.

Siemens has a large, integrated canvas of disciplines, technologies, and solutions to deliver a seamless and comprehensive office experience. With its suite of digital services Siemens offers dynamic data analysis in response to business and occupier needs. On top of this, its open and flexible platforms enable easy third-party and legacy system integration. Its philosophy is to partner with customers through the process, going on the journey to achieve the smarter workplace.

Already the contours of the future smart office building have been taking shape, as Siemens delivers a series of projects that demonstrate new concepts and suggest new directions.

Siemens Building Technologies will continue innovating with new systems and solutions to explore the fullest possibilities of digitalization. Its aim is to ensure that new workplaces are more agile, more connected, and more sustainable than ever before, with a better experience for people and an enhanced approach to well-being. These features, in turn, will create the conditions for the smart office of tomorrow – a workplace that is a magnet for talent, a place of innovation, and a source of productivity.

[siemens.com/indoor-positioning-system](https://www.siemens.com/indoor-positioning-system)

About Siemens Building Technologies

The Building Technologies Division is the world leader in the market for safe and secure, energy-efficient and environment-friendly buildings and infrastructures. As technology partner, service provider, system integrator, and product vendor, Building Technologies has offerings for safety and security as well as building automation, heating, ventilation, and air conditioning (HVAC), and energy management.

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About WORKTECH Academy

WORKTECH Academy is a global knowledge platform for the future of work and workplace. It brings the best insights, ideas, and evidence from the WORKTECH conference series, now in 18 cities around the world, 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. Siemens is a Corporate Member of WORKTECH Academy.

[worktechacademy.com](https://www.worktechacademy.com)

When building technology creates perfect places – that's Ingenuity for life.

Never too cold. Never too warm.
Always safe. Always secure.

With our knowledge and technology, our products, our solutions and our services, we turn places into perfect places.

We create perfect places for their users' needs – for every stage of life.

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