Team Topic and Number: Autonomous Workplace | Team 06

Team sponsor/chapter (if applicable):

Team Lead: Drew DePriest, WELL AP | CBRE

Team Members:

Name	Firm
Judith Amoils, CRE	Thinking Strategy: New Paradigms, Inc.
Christine McHugh	Copper Hill Development/Evercore CRE
Ginny Baxter	CBRE
Randy Shaw	BRYTESIGHT
Robert Capua	CLS Bank International
Cindy Leary	Citizens Bank
Vanessa Geyer	Citizens Bank
Kathy Fisher	Clorox

Input your submission below. Please remember that you have 1500 words to share your insights.

Executive Summary

Technology like Artificial Intelligence (AI), Machine Learning (ML), Robotic Process Automation (RPA) and more, has already, and will continue to change when, where, and how work happens. These technologies, supplemented with building-based technologies, such as intelligent Building Automation Systems (BAS), Internet of Things (IoT) sensors, and Bluetooth low-energy (BLE) beacons, lead to the *autonomous workplace.* The events of 2020 will accelerate this shift and will have a profound impact on how corporate real estate (CRE) leaders worldwide manage their portfolios.

For the office environment – at the heart of our discussion – the years leading up to the pandemic saw an early adoption of workplace technology as well as the beginnings of a movement toward "healthy buildings," led by benchmarks like [IWBI's WELL Standard](#) and [Fitwel](#). We focus here on the physical work*place*, and recognize that the entire technology stack will need to address overall work*space*, inclusive of all technology used by remote/work from home (WFH) employees.

Two key questions emerge as we look toward the end of this difficult period:

1. Will automation have replaced some jobs for good?
2. Will COVID-19 catalyze more rapid development of the autonomous workplace?

In short, we believe the answer to both questions is "yes," each one flavored by nuance and not without challenge. The degree to which COVID-19 can be considered a cause of either will be subject to much debate.

Will automation have replaced some jobs for good?

The answer here is sector dependent, and automation will help in some places. We point to the following key shifts, resulting from COVID-19, which affect the nature of work and job functions:

- **Online ordering, with logistics fulfillment:** online ordering will become the new normal for some services and retail. Some of these functions have already been automated, and we posit that perhaps *automation is accelerated* as justified by increased sales volumes.
- **"Lowest risk" replaces "lowest cost" for some supply chains:** we anticipate permanent shifts in some sectors for manufacturing, logistics and warehousing due to reengineering around critical components and need for resilience. As onshoring of these functions occurs, automation will be leveraged, and *will replace jobs* (happening already).

Will COVID-19 be the catalyst for more rapid development of the autonomous workplace?

The new world in which we find ourselves poses tremendous challenges for CRE, though some of them had already started before COVID-19. According to an October 2019 Federal Reserve Bank report (just months before the pandemic began), the number of U.S. residents who work from home grew from 500,000 in 1980 to 3.4 million in 2017. Collectively, we believe that "work from home (WFH)" will be further embraced by companies who might have considered it in the past and, after COVID-19, can now trust it as an effective model for their teams. For the autonomous workplace, this means greater investment in remote collaboration tools like Zoom, Webex, and Microsoft Teams, to name a few.

WFH brings its own set of challenges, namely in preservation of mental health and wellbeing of those employees. Bloomberg reported on April 23rd that the sudden increase in WFH has all but eliminated "work/life balance" that existed pre-COVID-19. An April 2020 survey conducted by Eagle Hill Consulting of 1,001 U.S. remote employees found a majority of respondents feel less engaged, less productive, and less positive about their career due to new working conditions.

CRE teams will need to take these impacts into account when making plans to return staff to the office. As these social behaviors evolve over time, so too must technology deployments change to have the most impact.

Forward-looking Themes and Scenarios
Several key themes should be considered as to the rise of the autonomous workplace in a COVID-19 world:

1. **Increasing automation -** the rise of automation and job replacement started before COVID-19 – while the pandemic is a strong and urgent catalyst on some fronts, acceleration is dependent on a number of variables unrelated to it. The business case for investment in RPA, ML, or robotics remains contingent upon net savings and efficiency gains, whereas "health and safety" improvements represent only one dimension of decision-making.

   Gearing Ratios
   As an example of the labor impact of automation, consider *Facility Management (FM) Gearing Ratios*. Recent advancements in BAS, supplemented with IoT sensors and ML, have diluted gearing ratios from (1) on-site FM engineer per 225,000 sf to (1) per 1 M sf. Automation thus has reduced labor need by 75% and also shifted the engineer's skill requirement from wrenches to digital diagnostics. This change has been well underway for some time, and is not COVID-19 dependent.

   Space Optimization
   Another example might include real-time, dynamic space optimization that combines ML, IoT sensors, and BAS interconnections. Floor utilization will be limited, and an algorithm that ascertains how many employees visit the office on a given day (as observed by IoT sensors) could autonomously schedule the building as a result. Janitorial, HVAC, and

AV reset tasks could be assigned based on actual occupancy, not just a default schedule.

<u>Building Engineering & Maintenance</u>
Existing building systems will work as "Virtual Amenities," used to assist monitoring and tracking with actionable and communicable data.

<u>Building Automation</u>
BAS will drive health initiatives with increasing circulation, fresh air (in line with afore-mentioned [Harvard study](#)), and optimizing humidity levels. Further, some will install inline UV systems to disinfect supply air streams, HEPA filtration, and air purification systems.

<u>Active Construction</u>
Lastly, we foresee construction projects leveraging self-service mobile apps for health checks before arriving on site. Some sites are also starting to implement video cameras with "computer vision" ML algorithms to track appropriate social distancing between workers.

2. **Economic health *is* employee health –** the world will quickly realize that economic health is tied to employee health, wellbeing (physical and mental) and safety. Consider Indoor Air Quality (IAQ): [LEED](#) and [WELL](#) certified buildings mandate "good" air quality, but perhaps the business case for improving filtration and fresh air intake in class B office buildings could grow because occupiers/tenants will now pay a premium for this to build trust with their employees in a "safe" workplace.

   Further, we consider employee health as a driver to new workplace applications and automation that facilitate social distancing in the workplace. Typical operations will increasingly include technology like IoT sensors for limiting daily occupancy and mobile credentials for touchless access to doors.

3. **Virtual replaces face-to-face –** we all rapidly learned how to collaborate virtually, a new experience for many organizations. Many businesses will boost their investments in digital technology to add resilience going forward, but perhaps this moment has forced businesses to understand the *value* of the workplace. If businesses can leverage technology to work productively from home, some may question why we're even *in* the office.

4. **Agility will be a survival skill** - we recognize that we are still quite early in the pandemic ([Yale estimates it could run well into 2021](#)) and don't know what we don't know. CRE leaders need to try, adapt and iterate again.

Risks and Challenges
We see the biggest risk in adapting an autonomous workplace in a COVID world as "getting it wrong" due to lack of scenario planning and preparation. Like any crisis, steps taken (or not taken) will inform and impact the organization for years to come.

The biggest challenge, then, would be "getting it right." Identify ways in which technology can make people better, not just replace them. Leadership needs to demonstrate as well as describe the work*place* and work*space* in terms of their own unique challenges:

Challenges of Deploying Technology Across Modes	
Work*place* (physical CRE asset, "the office")	**Work*space*** (includes all remote/WFH employees)
Infrastructure impact	Implementation skills required
Scalability across regions & locations	Comfort level of users for adoption
Difficulty in defining requirements and relevant investment	Shift in cultural norms and expectations
Physical access	Workload balancing - AI could overtake some currently manual tasks (reporting), could also push tasks to individuals ("book your own travel") and increase their workload

Key Recommendations
For the CRE professional, we offer three key recommendations for considering technology in addressing the unprecedented challenges before us:

1. **Define requirements and increment** – identify the solutions that meet your requirements and are viable *today*, prioritize and implement test cases, and then analyze and adapt. Iterative steps followed by measured adjustments can help you deploy quickly and avoid costly overcorrection.

2. **Be optimistic and prudent (not fearful)** – society has shifted into "new normals" almost every decade for the past 100+ years. Each felt more manageable because *we* dictated the terms (scale, schedule, perception, etc.). The shift we embrace right now can feel more overwhelming because those factors are being decided for us.

3. **Invest in tomorrow…today (Smarter vs More Costly)** – technology, while often more costly than traditional models at the outset, usually gets better, smaller, faster, and cheaper over time. If we were to perform a true financial analysis, we might learn much of the workplace automation investment we need would be partially or completely offset by improvements to existing Real Estate, Facility and Operations models.