HNI

FROM SENSORS TO SENSE-MAKING:

How connected technology is changing the way we experience, measure, and adapt the workplace

Workplace technology is not only changing the way we work, it's making a sizeable impact on the way we use, measure and manage our workplace environment. It gives us the capability to work anywhere and communicate with anyone regardless of location. It also helps remove 'the friction' when we access and use resources in the workplace. And it can help an organization assess and manage their real estate portfolios more efficiently and effectively. In short, it supports making the workplace a tool to support the business, not simply a cost to be managed. And the experience of COVID-19 is reinforcing this.

By Eric D. Johnson, Senior Workplace Advisor, HNI

IN THIS WHITEPAPER:

HNI organizes workplace technology into 2 key categories: User Experience and Real Estate Performance Improvement.

WHAT YOU WILL LEARN:

How new workplace-user interfaces create better experiences for both individuals and teams

Why continuous data collection is needed to truly understand utilization and occupancy in today's changing work environment

How intelligent work environments not only collect data, but translate data into actions that can improve experiences, maximize efficiency, and reduce operating costs

What failure modes to avoid when defining and implementing new workplace technologies.

Workplace technology is outpacing change in the physical environment

Technology is arguably the most powerful driver for workplace change. While the physical workspace is changing faster than ever, the rate of physical change remains at a snail's pace relative to technology. Consider that the earliest mobile technologies were embraced at ten times the adoption speed of personal computers; during a similar time frame, the basic components of the physical workspace changed very little.

While we typically think of a high-tech workplace in terms of what we can see - hardware such as large external monitors that make viewing data easier or mobile devices that allow us to work anywhere - it is also the software operating 'out of sight' that has a more pervasive impact on the way we work. Today, wireless networks and the cloud allow teams to share information across geographies, and those same underlying technologies that are rapidly changing the way we experience, measure, and control the workplace.

And users are demanding the best tech in the workplace

But it's not just the technology that's changing – it's the way businesses adopt the technology that is changing as well. Until recently, new technologies were adopted by businesses first. An individual might receive a new computer at work, and then later have access and resources to purchase a similar computer for their home. This flow has completely reversed. Today, the consumer market has access to the cutting-edge technologies first, which in turn raises workforce expectations, and is then followed by demands that similar technologies are available in the workplace.

> *Based on our experience, we have updated the way we categorize technology's impact on the workplace; we now see that impact in 2 broad areas:*
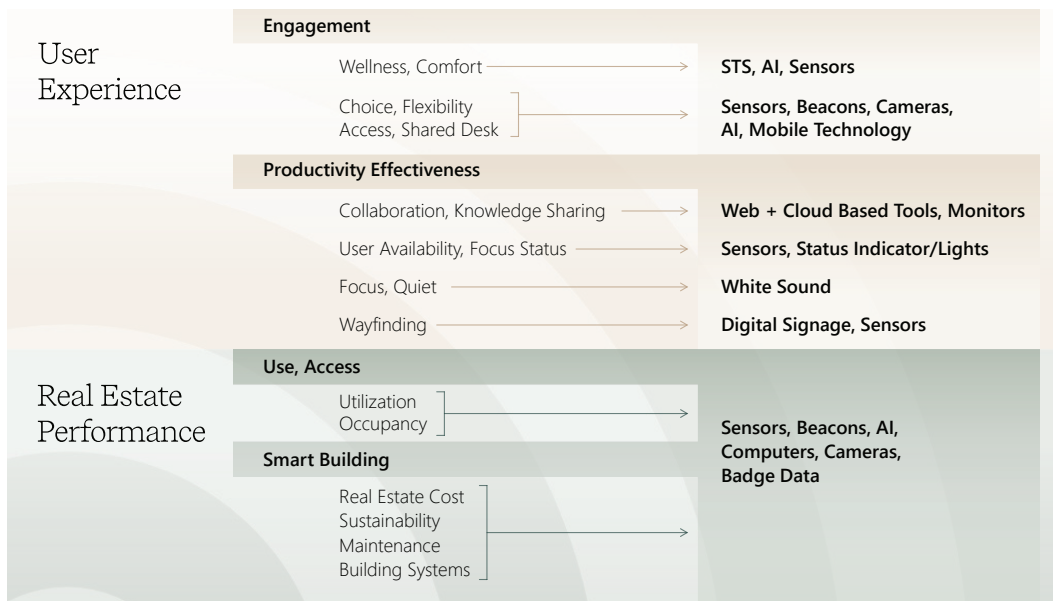>
> 1. ***Improving the user workplace experience***
> 2. ***Improving real estate performance***
>
> *And often, the same technology and underlying data services can be used to positively impact both areas simultaneously.*

FIGURE 1:

**TECHNOLOGY IMPACT
IN THE WORKPLACE**

*Technology impacts
the workplace in 2 key
ways: improving the user
experience and improving
real estate performance.*

User Experience		
Engagement		
	Wellness, Comfort	**STS, AI, Sensors**
	Choice, Flexibility Access, Shared Desk	**Sensors, Beacons, Cameras, AI, Mobile Technology**
Productivity Effectiveness		
	Collaboration, Knowledge Sharing	**Web + Cloud Based Tools, Monitors**
	User Availability, Focus Status	**Sensors, Status Indicator/Lights**
	Focus, Quiet	**White Sound**
	Wayfinding	**Digital Signage, Sensors**

Real Estate Performance		
Use, Access		
	Utilization Occupancy	**Sensors, Beacons, AI, Computers, Cameras, Badge Data**
Smart Building		
	Real Estate Cost Sustainability Maintenance Building Systems	

Impact #1: Improve User Workplace Experience

Technology is redefining how we experience and use the workplace, and how the workplace itself supports three critical activities core to effective work: knowledge sharing, collaboration, and resource availability. Technology is changing the way we accomplish these three activities, resulting in new ways of interfacing with the workplace, resources, and tools around us. And in the post COVID workplace, technology can play a key role supporting employees' sense of psychological safety. Together, these 4 areas technology supports all impact user engagement, productivity and effectiveness.

It goes without saying that technology has completely changed the way we share information at work. Collaboration, video conferencing, and knowledge sharing tools continue to evolve to support more effective team work and knowledge sharing. The cloud and wireless mobile technologies allow work to be completed anywhere, anytime. In the last few months, we have all learned the value of technologies like Zoom, Go To Meeting, and Microsoft Team Meetings, as well as knowledge sharing tools like Google docs and Microsoft Teams. As distributed work becomes more a part of 'the norm', our reliance on and need for competence using these tools will only increase.

Beyond sharing information, workplace technology can support individuals and teams locating available resources when they are in the office. Advanced sensor technology linked with the location app on mobile devices can locate the nearest available individual and collaborative workspaces and even provide wayfinding to those spaces. More advanced apps, with a user's permission, will link an individual's calendar to available conference rooms, make the required reservations, and with some technology platforms, even send invitations the meeting participants. Based on a 'learned' user profile, it will locate workspaces near – or far from – the user's team; or workspaces on the sunny side of the building, or on cooler floors. And in response to COVID-19 and the need to support psychological safety, many of these technologies, like those developed by Freespace, Avuity and Embrava, have been adapted to support cleaning protocols and communicate the status of cleaning individual spaces to the employees. Together, these technologies help remove the 'friction' of getting to work quickly and effectively.

And even when individuals are working in the office, with activity based work, they are just as likely to be working at a location other than their individual desk; or they may be working in an office without assigned desks. Either way, the sensor and IoT technologies can help colleagues locate each other. And for those who are not familiar with a specific workplace, these same technologies can provide wayfinding support so they make moving through the office easier.

Finally, crowdsourcing feedback in the workplace is one way to better understand how the office is performing over the weeks and months. Some technologies use a process similar to crowdsourcing to let users submit information, and in some cases even influence the temperature of their workspace

Impact #2: Improved Real Estate Performance

Maximizing the utilization of real estate and managing maintenance and operating costs is a key driver for technology adoption for most organizations. Conveniently, same technology and supporting data services that may be used to improve the user workplace experience may also be used to provide an organization's FM team with real-time and trending occupancy and utilization data. While the user experience relies on near real time data, the FM's focusing on real estate performance rely on trend data compiled over defined periods of time.

The data complied by these technologies provides insights into:

- Utilization and movement patterns
- Space-type occupancy and effectiveness
- Work group adjacencies

PROOF POINT

The New Horizons for Energy Efficiency report showed that depending on the size of the building and system controls, linking HVAC systems to building management systems can save between 24-32% of energy costs.

These technologies may also be integrated with an organization's IWMS programs to further improve the efficiencies of managing and maintaining a facility. Sensors that track occupancy can identify when an individual space or area is or is not occupied and signal the IWMS to adjust the HNAC accordingly. The data from the 2 systems can be compared to help determine why a space is not being used - a conference room with consistently low occupancy in the afternoon could be found to be too hot for the same periods of time. Like wise, if a floor remains unoccupied over a pre-determined period of time, all but the emergency lighting may be turned off.

In the post COVID workplace the same occupancy data may be used to help direct the cleaning staff; if a specific space - a workstation, conference room, restroom - has not been used, the cleaning crew can be notified and allowed to adjust their daily protocols. Conversely, when a space has been vacated, like a conference room after a meeting, the cleaning crew may be notified and directed to clean the room. Together, these can make maintaining and cleaning the facility more efficient and cost effective.

So, where do you begin when deciding what technologies to integrate into your workplace, and how? Like any first step in an informed workplace strategy process, it begins with clearly articulated objectives and problem diagnosis. Without laying the groundwork, it's easy to fall into one of the following failure modes.

Failure mode: unclear goals

An organization should determine the goal of collecting data, what data is required to achieve that goal, and what will be done once the data is collected and analyzed before selecting and installing any tools to collect and analyze the data. If the purpose is a one-time assessment to understand occupancy and utilization, algorithms that learn user preferences and provide options based on those preferences may not be needed.

Conversely, when the focus of a project is assessing and improving the user experience of a new workspace, tracking badge-in data and wireless network access may not provide the granularity of data required to understand where the user is in the workplace or how long they are in specific space types. In addition, if an organization will not take actions based on the data – is not willing or able to make changes to work processes or the workplace – the expense of collecting the data may not be justified.

The Technology Implementation Process Map at the end of this paper will help define an effective process for defining the goals and selecting the appropriate technology.

Failure mode: forgetting change management

Imagine one day that you're peacefully working at your desk, and you happen to drop your phone on the floor. While reaching under your chair, you spot a device mounted under your desk; it has a flashing red light. Alarming, right? What is this being used for and why? Am I being watched? For what? Am I not trusted?

While technology can have a significant and positive impacts in the workplace, if data collection isn't carefully communicated to employees and visitors it can feel like people are living a real world Big Brother scenario. All change management communications and activities need to be very specific, and include information in three key areas[1]:

1. Why this is happening (such as improving user experience and workspace utilization)

2. What the benefits of collecting this data will be to the workers and the company (possibly enabling their effectiveness while reducing the company's costs)

3. How this will occur (within a specified period or ongoing), and how information will be shared (without any personal information)

Additionally, transparency into where devices will be located, what they look like, what data will be collected, and how data will be used and reported is critical to success.

Failure mode: overlooking privacy concerns

Some employees will consider any collected data to be personal. It is therefore crucial that the methods and tools used to secure the data are clearly, consistently, and regularly explained. Privacy concerns often arise around three activities: data collection, data storage, and data reporting. Personally Identifiable Information (PII) is often a concern when it comes to data collection. If PII is being collected, it is crucial to explain how this information is scrubbed from the data set before the analysis is started. For example, if an organization would like to track utilization and occupancy and chooses to do this through a smart phone location app, it must be described to employees how the PII is scrubbed, and that the app is tracking the device, not the individual using the device.

[1] Johnson, Eric, Managing Workplace Change. HNI

Finally, the format of data reporting and level of detail may also be a concern for some employees. Employees must feel comfortable that any new technology in the workplace is about improving their experience, creating a more effective and efficient environment, and/or reducing costs – and not about determining how long they've been at their desk, or how hard they're working.

The Elephant in the Room: Artificial Intelligence

Artificial Intelligence, or Augmented Intelligence as it is also referred to, is the great unknown in this topic; definitions of these two terms are:

- Artificial Intelligence learns to the work for us

- Augmented Intelligence learns to help us work more efficiently and effectively by allowing us to be involved at certain points.

PROOF POINT

In a study completed by PWC, 72% of business executives believe AI will be the business advantage of the future.

Artificial Intelligence is particularly valuable in connection to the workplace because it can improve the experience, efficiency, and utilization of the workspace. Using algorithms, it can analyze millions of data points to define utilization and occupancy patterns, movement through a facility to identify critical adjacencies between work groups, and, based on historical data, proactively adjust mechanical systems to improve the efficiency of the workspace. It will be able to identify user preferences to improve each individual's user workplace experience.

While the full impact of AI is still being defined, we can expect that the future of the workplace will be a dynamic and responsive user experience – one in which data is used the physical workplace environment continually adapts to keep pace with changing work processes and business goals.

The Takeaways

The connected workplace is here to stay (and changing fast)

Sensor technology is now accessible for most organizations looking to create a connected workplace that can measure, monitor, and even anticipate our needs across various conditions.

Balance the organizational appetite for data with positive employee experiences

While the connected workplace has the potential to maximize efficiency and reduce operating costs, perhaps the bigger

opportunity is to enhance the positive experiences and performance of individuals and teams. Before initiating any workplace data collection, first determine how technology might benefit *both* the employee and the company. Once this is articulated, the data collection tools and analysis will become clear.

Find opportunity in data overlaps

Oftentimes, the same technology that is measuring and monitoring for facilities management could also directly benefit the employee. For example, sensors that

track utilization in conference rooms could also help a team find an open collaboration space in an instant. As always, a balanced and informed approach is recommended for any workplace change to achieve the highest return on your investment.

Make sure the employee benefits outweigh any privacy concerns

Robust communication, regular feedback opportunities, and clearly defined security protocols can help diminish many employee concerns that they are being spied on.

Insights to Action

Use the Technology Implementation process Map as a guide to defining requirements for technology, selecting the appropriate technology and developing the data analysis processes.

**FIGURE 2:
TECHNOLOGY
IMPLEMENTATION
PROCESS MAP**

| DEFINE ▶	IDENTIFY ▶	CONNECT ▶	ANALYSIS ▶
• Utilization • Mobility • Occupancy Patterns • Noise • Wayfinding • Presence • Workspace Reservations	• Existing data • Additional data • How data will be compiled and analyzed • How data will be used	• Technology • Data Services • Process Definition • Relevant Experience	• Analyze existing and new data • Develop recommendations relative to goals • Define processes for implementing change • Assess change effectiveness

Technology in the Workplace Slide Summary

The impact of technology in the workplace

The speed of technology change continues to increase, as is its impact on all facets of work and the workplace. Before launching new technologies, organizations need to carefully consider the goal of using new technologies, and how they will determine if they are achieving those goals.

3 key technology impacts

1. User Workplace Experience
2. Workplace Occupancy and Utilization
3. Smart Building integration
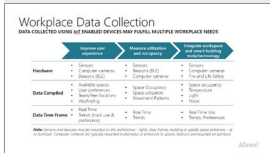
Workplace data collection

Key processes for collecting workplace data, and how single data source may be used to support user experience, improved utilization, and smart building application.

Location intelligence

Location intelligence is a way of organizing and integrating multiple technologies in order to provide both an integrated, more positive workplace user experience and the data to support maximizing workplace effectiveness and efficiency.

Workplace technology strategy

Define the goals for using technology/collecting data and how the data will be used prior to developing and deploying a new technology strategy in order to avoid hardware systems and data overload.

Workplace Advisory at **HNI**

The Workplace Advisory team listens. We apply research and our extensive workplace experience to assist organizations in the development and implementation of situationally appropriate workplace strategies. Strategies that align with organizational culture and business goals, support the ability to work effectively, utilize real estate assets as efficiently as possible, and adapt to changing business and work practice requirements.

Eric D. Johnson is a key member of the Workplace Advisory team atHNI. He effectively integrates the breadth of workplace considerations – design, talent, operations and technology – to creatively and optimally support changing work practices and an increasingly diverse workforce. Eric's career has included corporate facilities, interior design, strategic workplace consulting, and workplace and mobility program design, implementation and management. He has also taught graduate level workplace change and strategy; and is a certified interior designer, and a member of CoreNet Global and IFMA.

Looking for more?

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