ENHANCED EXPERIENCES IN THE SMART DIGITAL WORKPLACE

aruba

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Enterprise company

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WHAT IS THE SMART DIGITAL WORKPLACE?

Major trends – such as a changing worker demographics, mobility, IoT, consumerized technologies and intelligent buildings – are driving a global transition from traditional workplaces to a future workplace scenario that Aruba, a Hewlett Packard Enterprise company, calls the Smart Digital Workplace. The Smart Digital Workplace is designed to be an upgraded and more-productive work environment for employees, visitors, operators, and managers.

Globally, the acceleration in construction and leasing after the 2008-2009 recession, along with economic growth and resulting low unemployment, have driven robust new office construction and leasing activity. According to global real estate leader CBRE, office space construction will total about 160 million square feet in 2018; leasing activity (space absorption) is expected to total 32 million square feet in the US and 44 million square feet in Asia Pacific. Office vacancy rates in key European markets stand at low single digits. CBRE points out that A-list tenants "... will strive for greater workplace agility, flexibility, portfolio efficiency and improved user experience in 2018."[1]

The Smart Digital Workplace can be implemented wherever work takes place – in an office, factory, retail space, warehouse, or home. Its primary distinguishing characteristic is that it is interactive and adaptive – taking full advantage of the power of mobility and IoT – rather than fixed and passive. The Smart Digital Workplace maintains ongoing, dynamic engagements with its occupants and stakeholders.

The goal of the Smart Digital Workplace is to improve the usefulness and efficiency of a business facility to each of its stakeholders. Improvement may be measured in productivity, wellness, cost of operations, security and safety .

The advantages of the Smart Digital Workplace are captured in interactions we call experiences. Experiences involve the dynamic relationship between assets – people, things, or both – and the workplace environment. In this paper, we will describe examples of these experiences.

> " A-list tenants will strive for greater workplace agility, flexibility, portfolio efficiency and improved user experience. "

TRADITIONAL NETWORKS WILL NOT SUPPORT SMART DIGITAL WORKPLACE EXPERIENCES

Why buy an enterprise network? For decades, the primary answer has been, "to connect computers and end-user devices." This approach dates back to the original design of LANs and the client-server computing model, which is decades old. The progression to web architecture and mobile devices has not, until recently, challenged the old approach. While the need for basic connectivity and throughput remains, the Smart Digital Workplace requires something new because the requirements have dramatically changed.

Most existing enterprise networks were built to support outdated assumptions, such as protected and clearly-delineated office space, wired workstations in fixed locations, owned or long-term-leased facilities and limited-access Wi-Fi usage. These assumptions do not match the Smart Digital Workplace, which is wireless-centric, application-focused, mobile, and not physically delineated.

As vendors have attempted to broaden their network technologies, the result has been an intertwined patchwork of separate components, incompatible UIs, and multiple layers. The standard approach toward easing this tangle has ironically been to add even more proprietary layers (and hardware) purely dedicated to orchestration, security, and other functions which were not originally built in. This will not, and does not, scale or meet customers' needs.

These networks do not lend themselves well to supporting user-centric experiences, where the user's device, apps and intent combined with context from the physical environment create new experiences. The old-style networking business model is fundamentally based on a closed ecosystem with a design approach originating from the data center. Under this construct, applications and flows are mostly deterministic and pre-defined, ultimately creating poor end-user experiences.

In the Smart Digital Workplace, the network must move beyond its traditional role of connectivity and flow management. It becomes the foundation for context-aware connectivity and secure access. The network provides services and application-level capabilities, and integrates with multiple systems to provide multi-layer, seamless experiences.

It's time for a smarter and more open approach to enterprise networking that is optimized for experiences in a modern workplace.

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[1] "2018 Global Real Estate Market Outlook," CBRE Research, 2018.

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SMART DIGITAL WORKPLACE EXPERIENCES IN DETAIL

In the context of the Smart Digital Workplace, an experience is a component of a use case. The Smart Digital Workplace seeks to create experience interactions that are both positive and rewarding within a use case.

Before discussing use cases, it may be helpful to define some of the various people and device roles found in the workplace.

- **On-Site Worker.** An on-site worker is a frequent and regular user of the facility. This includes site-based personnel as well as certain service workers, such as security guards, who are in the facility on a regular basis.
- **Operator.** An operator specializes in operating or maintaining the physical facility and its environmental, amenity, security and safety systems. Examples include building engineers, on-staff technicians, and third-party catering personnel. This category also includes IT staff whose work relates to the in-building systems such as networking and end user technology.
- **Manager.** A manager operates at a more strategic level, on behalf of the business. Examples include Corporate Real Estate managers, Line of Business (LOB) managers, functional managers like Directory of Security, and top level executives.
- **Visitor.** Visitors are on premise for a temporary period, with varying degrees of frequency. A visitor is typically visiting or meeting with an on-site worker.
- **Remote worker.** This category covers workers who do not normally occupy the physical site, but are treated as though they have an on-site office or physical position in the facility.

Devices have roles in the Smart Digital Workplace, too:

- **Sensors** detect and collect various forms of information and conditions in the environment.
- **Actuators** perform actions, such as a magnetic door lock or the motor on an adjustable desk.
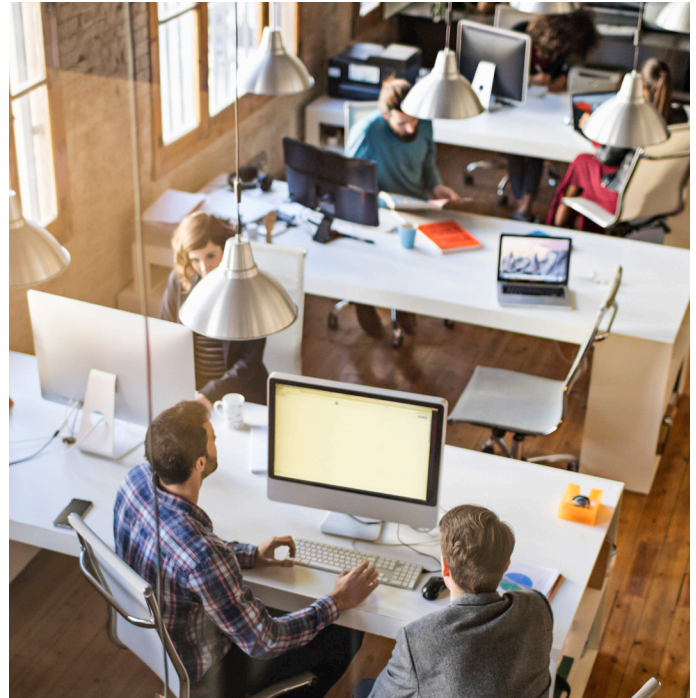
- **Infrastructure elements** combine sensors and actuators to provide services such as network connectivity, physical transport, power, lighting, HVAC, printing, multimedia, fire suppression, and many others.
- **Other devices** run the gamut – but any device, with proper authorization, can be securely connected in the Smart Digital Workplace.

With the power of a Mobile First network with IoT, the Smart Digital Workplace can enable the following types of experiences for on-site workers:

- **A vibrant, activity-based working environment.** In the Smart Digital Workplace, workers are fully untethered from fixed seating positions. Open floor plans, with intentional variety through a mix of unassigned seating, collaboration rooms, quiet rooms and huddle areas, enable higher productivity and improved employee wellness. IoT sensors in smart furniture and the surrounding environment connect securely through a common network to provide real-time usage data back to analytics and space utlization software.
- **Indoor location-based services.** In a workplace that successfully enables worker circulation across the physical environment, the need for finding people, places, and things become more commonplace. Network location data, combined with a smartphone app, can guide workers to meeting rooms, fellow co-workers, or key assets with turn-by-turn indoor navigation.

- **More efficient booking and utilization of meeting rooms.** Meeting rooms and other common areas in the Smart Digital Workplace utilize the network and IoT to enable ad-hoc meeting room bookings without conflicts, measure actual room utilization, and simplify common interactions with A/V systems to enable tasks such as wireless screen sharing with ease.
- **Enabling personal environmental controls.** A mobile app and IoT sensors can adjust lighting, furniture, and HVAC for better occupant personalization. When spaces become unoccupied, HVAC and lighting can be reduced to save energy. Other systems, such as motorized shades and dynamic sound absorption utilize the common network, IoT sensor pool, and backend logic to adjust for optimum working conditions and energy use.
- **Entry and exit (physical access control).** The Smart Digital Workplace can seamlessly detect a person's identity and enable him or her to enter and exit authorized spaces, using technologies such as video analysis, biometrics, RFID, Infrared, Bluetooth, and Wi-Fi. Data from the network is combined with security system data to paint an accurate picture of identity and entry/exit actions taken. Smart locking systems tie access and exit to credentials stored on mobile devices.
- **Cyber security without user impediment.** The Smart Digital Workplace provides comprehensive security that does not interfere with the user experience. Sensors, network security fabric, and analytics help to ensure that a person cannot connect a "rogue" device or use an authorized device in an anomalous way. Physical placement of bugs, keyloggers, and other rogue devices can be intercepted in many cases. Denial of service attempts and advanced persistent threats can be prevented if they originate from connected devices.
- **Physical security and safety.** Sensors and the network are integrated with security systems, video analytics, and mobile applications to enhance the occupant's ability to report and respond to an incident, and verify safety. Sensor detection and network activity can help first responders locate people trapped or disoriented after an incident occurs.
- **Imagination is the only real limit over time.** Many other use cases will undoubtedly arise in the Smart Digital Workplace, because the interactive environment provides a rich tapestry of data and the technologies consistently improve. The key is to tie systems, applications, and devices together in new and innovative ways.

There are additional visitor or service personnel experiences in the Smart Digital Workplace. For example:

- **Enhanced visitor check-ins.** A visitor can check in and register on an interactive kiosk, obtain guest Wi-Fi credentials, and utilize a smartphone as an access control key through a single unified workflow. The system can require an escort and verify that the escort is present, if necessary. Coordinated systems enable visitor parking via license-plate tracking, and provide other amenities.
- **Real-time tracking.** For security reasons, visitors and service personnel can be closely tracked in real-time. Data from sensors, the network, and personal devices can be analyzed for anomalies. AI-powered video analytics, connected through the network, can be used to detect theft. Beacons and other sensors can detect when a user is in an unauthorized location.
- **Shared access to multimedia and collaboration facilities.** Similar to their on-site worker counterparts, visitors can quickly and intuitively wirelessly project content in conference rooms, subject to proper credentials and other safeguards.

Facility and IT operators can benefit from the following experiences in the Smart Digital Workplace:

- **Real-time utilization information.** The network, combined with sensor systems and proper integration, can provide real-time insights of occupancy and other space utilization metrics. Analytic software can identify patterns in traffic, seating, and other factors which can be adjusted for more efficient utilization. Utilization can also be mapped to environmentals – for example, does an underutilized position get too much sun during the day, or too much HVAC flow?
- **Network assurance.** Operators charged with providing wireless and wired network services can utilize advanced machine learned analytics, coupled with sensor input and other data, to optimize network performance and direct capacity where it is needed automatically. Anomaly detection can proactively alert operators to security or performance issues without requiring regular monitoring.

- **Asset tracking.** Asset tracking can have a direct balance sheet and operating cost impact. Smart furniture, tags and other techniques can provide exact inventory and location of physical assets, such as expensive equipment or furnishings, art, documents, etc. Advanced dashboards and mobile or desktop applications provide visibility and reporting. In a factory, asset tracking can monitor supplies, work in progress and finished goods throughout the manufacturing, testing, and shipping process. Tracking can reduce pilferage, leakage, and other forms of theft.
- **System control and interconnection through a single enterprise network.** Because the network in the Smart Digital Workplace has an advanced security fabric, building management systems and other controls can be connected seamlessly with enterprise-grade security and visibility. This eliminates high risk – in the form of unmonitored PCs, terminals, and islands of connectivity. Included in this set of control systems are video surveillance and access control systems along with environmental and building management systems. The replacement of inflexible and hard-to-manage VLAN/ACLs with device and application aware security policy controls greatly simplifies and improves the operation, maintenance and control of building infrastructure. The same is true for manufacturing or warehouse control and monitoring systems.

A remote worker can experience all the capabilities the Smart Digital Workspace provides to occupants, as appropriate to each user's role. He or she can still be properly credentialed, detected via sensors and computer utilization data, and enabled via mobile app to book facilities and enjoy other Smart Digital Workplace experiences.

If the remote worker is located at a temporary office or branch, the network and sensors can provide a fully-functional office, with the same degree of protection and services encountered at a dedicated hub or branch. This is extremely useful in banking, retail and other industries with branch locations.

Managers can benefit from the following experiences in the Smart Digital Workplace:

- **Complete real-time picture of how the facility is utilized**, based on the rich data and analytics associated with the interactive environment and the network. This can be used for spacial planning, positioning of groups, adjustment of work patterns and detection of inefficiencies. Data and analytics can be used to monitor costs and optimize financial efficiencies associated with facilities.

- **Near-zero-cost moves.** When individuals or groups relocate within the facility, space management applications, coupled with network and sensor input, analytics, and integration, combine to automatically execute the steps required for the moves. Mobile-first connectivity eliminates the need to repatch/reprogram Ethernet data drops or dedicated phone connections.
- **Space as a service.** Smart Digital Workplace technologies and associated applications can be used to enable managers to reserve and configure swing space, temporary space, shared facilities, co-working space, and other physical assets. A mobile-first networking approach allows workplaces to combine across locations and domains, so that an enterprise can choose any combination of dedicated space, remote space, or temporary space, in partnership with real estate providers – realizing the promise of space as a service.

The Smart Digital Workplace offers great potential for new experiences. Aruba envisions that, within a few years, the Smart Digital Workplace will be the norm, and enterprises will expect their space and tech to be configured as Smart Digital Workplaces.

THE SMART DIGITAL WORKPLACE DEMANDS A USER-CENTERED NETWORKING PLATFORM

The Smart Digital Workplace exhibits several characteristics that affect network requirements, such as:

- **Rapidly growing quantity and diversity of connected devices – the IoT avalanche.** Between IoT devices, smartphones and other personal devices; collaboration, audiovisual and environmental systems; the intelligence and sophistication of the network is shifting to the user and end-point itself with edge focused connectivity and security technologies.
- **Universal mobility.** New use cases including ones associated with IoT, such as Smart Lighting, will increasingly favor wireless connections for ease of deployment and cost. This requires a networking approach, where devices are connected and secured with consistent policies, quality of service, and reliability behaviors across either wired or wireless connections.
- **Cloud-based infrastructure and applications.** Increasing amounts of Smart Digital Workplace application traffic will be destined for the cloud. Fewer East-West traffic flows combined with increased North-South traffic flows will drive the need for advanced end-point policy and access enforcement combined with intelligent WAN routing.

- **A high level of diverse and unpredictable data.**
Sensors, multimedia equipment, laptops running traffic-heavy applications like real-time conferencing, and handheld devices generate large volumes of unpredictable traffic, with characteristics that are dissimilar to traditional client-server environments. The network must be adaptive and highly-instrumented in order to respond to these flows, configure rapidly for new flows, and detect anomalies.

- **Application-level integration with the network.**
Smart Digital Workplace experiences are enhanced when network context and location is combined with IoT context from the physical environment. The network needs to provide a scalable, secure, and programmatic way to federate context from its own fabric and sensors to other systems.

- **No fixed borders.** There is less and less difference between "the office" and elsewhere. Enterprises and other institutions will increasingly support remote workers, temporary space, co-working space, shared offices, and many other flexible configurations. The network must provide the maximum security and functionality supported across each environment for each device and each end user.

With these requirements and others in mind, Aruba's Mobile First Architecture and suite of products are purpose-built to support the Smart Digital Workplace. Aruba strongly believes that the Smart Digital Workplace, with all its promise, needs a smarter enterprise network to provide a communications and security foundation that is flexible, scalable, and protected against threats and risks.

The network should be both a platform and a sensor, providing rich data for analysis and integration as the basis for new experiences. Improved tools and technologies such as AI and multiple wireless interfaces must be built into the network architecture. Rich APIs and built-in applications provide opportunities for best-of-breed partners and improve the management and orchestration experience for IT personnel.

Aruba's architecture and products create a networking environment that is mobile-first, secure, open, and autonomous. Aruba regards these as the key attributes to support future network requirements.[2]

Our Mobile First Architecture creates a network platform that meets or exceeds the needs of the Smart Digital Workplace, at lower capital and operating cost per unit of space, per occupant, and per device, than traditional networks. Aruba is working with an expanding range of partners to create an ecosystem of experiences for all stakeholders.

Above all, Aruba believes in "Customer First, Customer Last." This dedication to the customer's requirements drive everything that we do.

[2] To learn more about Aruba Mobile First Architecture go to https://www.arubanetworks.com/solutions/mobile-first-architecture/