Hype Cycle for the Digital Workplace, 2020

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By Analysts Matt Cain, Michael Woodbridge

Initiatives: Digital Workplace Applications and 1 more

Application leaders supporting digital workplace initiatives are in the spotlight, given the need to improve the digital resiliency of the workforce during and after the pandemic. This Hype Cycle analyzes the most important tools and disciplines needed to boost workforce digital dexterity.

Analysis

What You Need to Know

The COVID-19 pandemic has accelerated many workforce trends, such as the need for remote work proficiencies, with a rich collection of SaaS-based team and personal productivity applications (the “new work nucleus”), and the replacement of analog and paper processes with digital equivalents.

Most organizations have discovered a new-found respect for IT during the pandemic due to its ability to preserve workforce continuity amid a rapid shift to mandatory work-at-home and other herculean measures. The IT group should exploit the opportunity this presents and double down on digital workplace strategies. The digital workplace is no longer “nice to have;” it is critical to achieve and maintain digital resiliency.

The need for digital replacements for in-person activities is leading to heightened interest — not just from IT, but from the broader business community — in emerging technologies included in this Hype Cycle, including virtual events, employee productivity monitoring, desktop-as-a-service and ambient virtual meetings.

The Hype Cycle

The year 2020 is a great time to look at the past decade and plan for the decade ahead. COVID-19 has revealed the brittle nature of many paper and analog processes, and the existential need to accelerate digital transformation. When viewed from a historical perspective, the pandemic is likely to be seen as an inflection point in human development, when we officially ended the post-Industrial Age and commenced the true digital era. For many organizations, COVID-19 elevates digital workplace strategies from nice-to-have, to must-have status, and it makes workforce digital dexterity a C-suite issue. A recent Gartner digital workplace leader survey showed that 68% of respondents agreed that “since COVID-19 more C-level execs have expressed involvement in digital workplace.”

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The 35 innovation profiles in this 2020 Digital Workplace Hype Cycle represents the likely evolution of workplace technologies and disciplines over the next decade. Organizations can use this Hype Cycle to identify the technologies that are mostly likely to drive competitive advantage (or offer better constituent services) through a more effective and engaged workforce. The three core digital workplace themes that are harnessed to boost workforce digital dexterity — employee engagement, future of work, and reimagining workplace technologies — are well represented in this Hype Cycle.

**Employee engagement** — We have added a bumper crop of innovation profiles that will help with the post-COVID-19 recovery. An obvious one is employee wellness, which reflects the shift in HR priorities (in some circumstances) to greater attention to employee mental and physical health. An XLA — or experience level agreement — is an attempt to rethink service-level agreements from the employee's perspective. BYOT (bring your own thing) is a necessary outgrowth of the move to mandatory work-at-home. Not all innovation profiles will be welcomed by employees; the innovation profile for employee productivity monitoring has the potential to diminish employee engagement.

**Future of work** — We have added several innovation profiles that reflect the emergence of what is sometimes called the “distance” (or “touchless”) economy; business activities that don't rely on face-to-face human activity. Virtual events are largely self-explanatory, and they are joined by ambient virtual meetings, which represent a new generation of meeting solutions that attempt to more closely mimic an in-person meeting. Other returning innovation profiles point to significant changes in how work gets done — many of which are accelerated by COVID-19 — such as immersive workspaces, smart badges and smart workspaces.

**Reimagining workplace technologies** — Mandatory work-at-home dynamics have boosted the profile of desktop-as-a-service (DaaS), which we have added to the Hype Cycle for the first time. Given the growing accessibility of robotic process automation to regular employees, we have added it to the list of “democratized” technology services (which also includes the innovation profiles for citizen data science and citizen integrator tools). Content flow is making its first appearance: it represents the idea that organizations get the most value out of content assets by intelligently delivering them in the right context at the right time for an unlimited range of business processes.

*Figure 1. Hype Cycle for the Digital Workplace, 2020*
The Priority Matrix

What was quickly apparent in the transition to mandatory work-at-home in 2020 was the importance of what we call the “new work nucleus" technologies. These are SaaS-based personal and team productivity applications supplied by Microsoft (Office 365), Google (G Suite) or best-of-breed vendors such as Box, Dropbox, Slack, Zoom, Workfront among others. There is no innovation profile for the new work nucleus because it is represented in this Hype Cycle by its constituent parts, such as content collaboration platforms, meeting solutions, workstream collaboration and collaborative work management.

While none of these individually are ranked as transformational technologies, when assembled into a new work nucleus they are the most accessible transformative element represented in this Hype Cycle. The pandemic made it clear that these tools are the foundation, not only for supporting remote work, but for lightweight process automation, accelerating collaboration activities and integrating employee-driven applications. These workloads, coupled with the aforementioned “democratized" technology services, represent the easiest and fastest route to improving workforce digital dexterity.

In a similar vein, EXTech, or employee experience technologies, are a collection of six HR-centric technologies which can be used to create a culture of workforce digital dexterity. This collection — which includes learning experience, employee communication and employee recognition
platforms, along with best practice nudge engines, interactive intranets and interactive surveys — represents the essential idea that workforce digital dexterity is a shared responsibility across the organization. It is highlighted here because the partnership between IT and HR is essential for creating a culture of workforce digital dexterity, which in many ways is the most critical of workforce development activities to ensure future prosperity.

Figure 2. Priority Matrix for the Digital Workplace, 2020

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<td>Ambient Virtual Meetings</td>
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The pandemic has caused us to perform a more aggressive reevaluation of the innovation profiles included in this Hype Cycle than we normally would. We have removed seven innovation profiles,
not because there was anything inherently wrong with them, but to clear the way for higher priority innovation profiles, many of which we have highlighted in the introduction section of this document. We have removed adaptive learning, content integration services, design thinking, unified workspaces, digital credentials, influencer and advocacy marketing, and enterprise video content management. We have folded personal analytics into the larger category of workplace analytics.

On the Rise

**Immersive Workspaces**

**Analysis By:** Marty Resnick

**Definition:** Immersive workspaces are collaborative work environments that convey a sense of real-world presence through the use of visual, auditory, haptic and other sensory elements. They principally employ virtual reality (VR), augmented reality (AR), and mixed reality (MR) technologies and techniques, but also utilize multiple displays and are delivered to users through head-mounted displays.

**Position and Adoption Speed Justification:** Immersive workspaces will provide enhanced opportunities for meeting solutions and telecommuting by delivering environments designed for deeper collaboration. They will facilitate richer and more natural collaboration, knowledge sharing, onboarding, and training, facilitated by the use of immersive technologies, multiple displays and other sensory elements.

Immersive workspaces are continuing to appear and mature within VR platforms, such as those of Oculus, but developments have also moved toward MR. Immersive workspaces have the ability to create 3D virtual offices and desktops in a VR world. Also emerging is the ability, using MR, to place digital objects (such as images of monitors) on walls in virtual representations of the physical world, which offers new collaboration, interactivity, visualization and productivity opportunities.

Immersive workspaces are at a very early stage of development, but the demand for them is increasing, especially as organizations continue to work from home. They are deployed in pilots and proofs of concept (POCs). However, large enterprises are investigating new and innovative ways to enhance collaboration and communication through the use of immersive technologies.

**User Advice:** Organizations looking to use immersive workspaces to enhance communication and collaboration among members of an increasingly remote workforce and with business partners should:

- Evaluate the market and experience virtual desktop applications through VR ecosystems, such as those of HTC (Vive) and Facebook (Oculus), as well as MR ecosystems such as Microsoft (HoloLens 2).
- Give their employees the opportunity to test immersive technologies.
Currently, the use of 3D-enabled applications in immersive workspaces is limited, and availability of these applications will need to grow to meet the true value of immersive workspaces.

**Business Impact:** Immersive workspaces could offer organizations opportunities to support work from home, reduce travel expenses by improving remote collaboration and to increase productivity through design visualizations. They also could provide enhanced analytics collaboration through immersive analytics. Immersive workspaces could improve connections and engagement between office-based workers and remote workers and suppliers. Providers of virtual meeting, conferencing and training solutions should be looking to add immersive workspace capabilities to their products.

**Benefit Rating:** High

**Market Penetration:** 1% to 5% of target audience

**Maturity:** Emerging

**Sample Vendors:** Cisco; Facebook; HTC; Igloo Vision; Microsoft; Spatial Systems; vSpatial

**Recommended Reading:**

“Cool Vendors in Augmenting Human Experiences”


“Market Guide for Workstream Collaboration”

**Content Flow**

**Analysis By:** Michael Woodbridge

**Definition:** Content flow is a discipline that helps organizations measure the effectiveness of their content services strategy. It represents the idea that organizations get the most value out of content assets by intelligently delivering them in the right context at the right time in an infinite variety of business processes.

**Position and Adoption Speed Justification:** Content in the form of documents and other rich media is the primary medium for humans to produce and consume information. It is critical to all aspects of how a business functions — from unlocking new areas of insight and innovation to
automating existing business operations. However, organizations have always struggled to deliver content services effectively. They are often deployed in fragmented silos of information and optimized levels of employee consumption have proven elusive.

To improve content flow — or return on content assets — it must be measured. Content should flow around an organization like electricity where it can be easily consumed with the appropriate safeguards. Content flow is a new concept that pushes organizations to create a content vision, develop a strategy and continually measure its effectiveness as it is deployed.

**User Advice:** Organizations can measure content flow by evaluating and measuring four key business value indicators:

- The availability of content in a relevant and consumable form regardless of point of origin, location (inside or outside the organization) or device.
- The degree to which content is automatically contextualized with appropriate supporting information.
- The timeliness with which relevant content is surfaced to employees when they need it.
- The degree to which content is seamlessly integrated into business applications and processes.

Each of these indicators have several attributes that can be measured to determine the degree of content flow in an organization. For example, for availability, the presence of on-premises only content repositories or legacy file systems behind a corporate firewall results in a loss of content flow. Likewise, the presence of secure cloud content repositories with multiple access points is a conductor of content flow, increasing the “current” through that indicator. These are measurable aspects that can help organizations determine where to invest in improving and adding new content services.

Content flow also needs to be regulated and there are two important supporting elements that organizations should consider here. These are the equivalents of resistors in an electrical circuit, required to keep the flow regulated and safe:

- **Information Governance:** The controls placed on content to minimize the risk it exposes to the business. For example, privacy controls and retention and disposal functions
- **Protection:** The controls associated with content that ensure appropriate levels of security and protection are applied.

**Business Impact:** All organizations should aim to establish a high degree of content flow within their organization. Measurement is critical to determine how effectively they are getting a high rate of return from content assets; content flow is a key enabler of:
Internal Talent Marketplaces

Analysis By: Helen Poitevin

Definition: The “gig economy” relies on marketplace platforms to match customer demand to workers who are offering products, services or solutions. An internal talent marketplace uses similar principles to match internal employees and, in some cases, a pool of contingent workers, to short-term project and work opportunities, without the involvement of a recruiter. It includes marketing features, matching algorithms and feedback functionality, and it aligns with principles of adaptive organizational design.

Position and Adoption Speed Justification: Internal talent marketplace platforms enable workers to explore growth opportunities, take on temporary “stretch” assignments, and build a portfolio of work that they can use to market themselves in pursuit of further work. Innovation teams and business units that have adopted management approaches involving, for example, self-forming teams were the first to show interest in investing in internal talent marketplaces.
Internal talent marketplaces may also tap external talent, but they primarily focus on matching internal talent to job deliverables, small tasks and roles.

These marketplaces are relatively new solutions, so their availability is limited, as is the market’s readiness for them. The lack of availability has led some organizations in high-tech, telecom and professional services industries to build their own solutions.

The COVID-19 pandemic has given rise to projects and challenges that were often unanticipated. Consequently, many organizations need to gather knowledge of their internal skills in new ways. This has led to increased interest in internal talent marketplaces, which can help managers with the redeployment of staff from low-demand to high-demand activities. Furthermore, these solutions can help organizations tap into existing talent when external hiring is not an option. They also make it easier to reskill and upskill talent when new skills are needed quickly.

The performance of matching algorithms and the ability to integrate data from other systems remain clear differentiators between solutions. Accurate detection and tagging of competencies, skill sets, knowledge, experience and other attributes is not easy. Matching that information to the wide variety of work opportunities in large organizations will take time.

User Advice: Application leaders in organizations that are not ready for internal talent marketplaces can start by investing in internal mobility processes. They can use existing human capital management and talent acquisition technologies to improve visibility and consistency when filling new positions with internal candidates.

Application leaders supporting organizations that are keen to introduce an internal talent marketplace should start by piloting it with groups that are ready for one — these may include innovation and agile development teams. During a period of pandemic response, an internal talent marketplace may be used chiefly for the redeployment of talent from teams with low volumes of work to teams with high volumes. The emerging state of internal talent marketplace technologies means that pilots or deployments of limited scope can help give providers and internal teams the time to learn how to best derive value from these solutions. Application leaders should anticipate the need for significant co-development investment with application providers. They should also evaluate internal resource availability and determine whether they could manage their resources better by building their own application, or by tapping into the development teams, data scientists and roadmaps of technology providers.

The most advanced organizations will be ready to invest in integrating a variety of data sources to automate the detection and classification of skills and competencies. Data sources can include project management systems, collaboration tools, knowledge bases and expertise location systems.

Application leaders looking to invest in internal talent marketplace solutions must invest equally in design thinking and similar methodologies, such as workplace ethnography. Breaking down jobs into deliverables, and enabling employees to “bid for” and win such jobs represents a significant
change to management practices. Proven practices have not been established, so careful measurement of the impact on workers’ engagement and productivity, along with team performance, will be crucial.

**Business Impact:** The COVID-19 pandemic has increased the need for business agility and new ways of working in a context where the gig economy had already challenged established notions of employment. Marketplace-based platforms make it much easier to connect customers directly to suppliers. Internal talent marketplaces take advantage of the increased flexibility of the gig economy and such platforms.

Large enterprises needing to pivot quickly and push innovation to the edges may be encumbered by heavy management and control structures. However, internal talent marketplaces have the potential to change that. They establish trust through feedback mechanisms. They allow for worker-led innovation and help workers take full control of their careers. They enable much better and more granular tracking of the skills, competencies, knowledge and interest of individual workers. This, in turn, will give enterprises a much better view of their workforce and improve workforce planning. Internal talent marketplaces will help bring about leaner, more agile and more adaptable organizations.

**Benefit Rating:** Transformational

**Market Penetration:** 1% to 5% of target audience

**Maturity:** Emerging

**Sample Vendors:** 365Talents; Ascendify; Catalant; Gloat; Oracle; Patheer; ProFinda; Workday (Rallyteam)

**Recommended Reading:**
- “AI Use Cases in Human Capital Management Technology”
- “Finding and Building Talent in the Digital Talent Ecosystem”
- “Workforce Planning — How to Use Technology to Support Planning Processes”
- “The Future of Talent Acquisition Requires Talent Engagement and Systems of Action”

**Ambient Virtual Meetings**

**Analysis By:** Christopher Trueman

**Definition:** AVM applications are real-time collaboration tools that support interactions over a network between team members to more closely approximate a real-world office experience. AVM apps are often positioned as creating a “virtual office” environment in one of the two ways. Either by always-on meeting rooms which workers can jump in and out of at will, or by providing instant-
connectivity to colleagues via video conference based on their presence state. In this way, AVM apps make video an omnipresent part of the work environment.

**Position and Adoption Speed Justification:** Ambient Virtual Meetings emerged from the Meeting Solutions market in response to the unique needs of remote workers. Most of the major technological hurdles have been solved by the Meeting Solutions and web-conferencing providers that proceeded them. But the application of this technology for Ambient Virtual Meetings is still very new and requires an accompanying change in work style or culture. Because Ambient Virtual Meeting apps focus heavily on spontaneous collaboration between team-members, they are a complement to, not a replacement for, Meeting Solutions. Since most IT organizations prefer a single vendor product for meeting platforms, the value that Ambient Virtual Meetings can bring has had difficulty resonating with enterprise IT buyers. Due to the COVID-19 pandemic and the uptick in remote working it caused, interest in AVM applications has risen significantly in 2020.

**User Advice:** Evaluate Ambient Virtual Meeting apps as a means for increasing the engagement and visibility of remote or geographically separated workers. AVM apps will likely provide the greatest benefits to teams or groups whose activities require frequent contact or are conversationally driven. Social interactions over AVM apps should be encouraged to better approximate the spontaneous interactions that can happen with in an office environment. While team messaging and workstream collaboration tools are commonly used for both social and work interactions today, the video-centric approach of AVM apps stands apart because they encourage spontaneous real-time communication. This is the virtual equivalent of someone stopping by your desk in the office for a chat. AVM services are suitable for most ad hoc meeting scenarios; for scheduled or more formal meetings, the organization's Meeting Solution should still be preferred. Expect the work style and cultural changes required for successful adoption of AVM to place a heightened focus on video/meeting etiquettes.

**Business Impact:** Ambient Virtual Meeting applications provide a novel way to engage remote or geographically dispersed workers through the pervasive use of video conferencing. This engagement style promotes a sense of workplace community, mitigates feelings of isolation (the No. 1 reason full-time remote workers leave organizations), improves responsiveness and leads to a more productive work style.

Approaches vary, but AVM apps typically feature several design aspects in common, including:

- Dependence on a lightweight video conferencing experience (webcams are required)
- Continuous- or instant-connectivity to video conferencing, depending on presence state
- Encouraging spontaneous, social interaction over work tools

Since AVM brings few benefits to colocated teams, expect the overall impact to be directly proportional to the number of remote or geographically dispersed workers within a given team or
Teams spread across widely different time-zones (anything more than 4-5 hours difference) will likely see a reduced impact from AVM as well.

**Benefit Rating:** Low

**Market Penetration:** 1% to 5% of target audience

**Maturity:** Emerging

**Sample Vendors:** Embryo; Jamm; Miro; Pragil; Remotion; Sococo; Tandem; Teemly

**Recommended Reading:** “Adoption of Meeting and Workstream Collaboration Solutions Spikes in Response to Coronavirus (COVID-19) Pandemic”

**Peer IT Support**

**Analysis By:** Chris Matchett

**Definition:** Peer IT support occurs when business consumers get technical support and advice from other business consumers at Level 0 (self-service) before (or instead of) contacting a Level 1 IT service desk. This commonly takes place unofficially and rarely officially via forums and collaboration portals, or in person.

**Position and Adoption Speed Justification:** The consumerization of IT has changed employee expectations of IT support. Business consumers leverage user communities for quick and accessible resolution. This includes support forums, internet search engines and services such as LinkedIn and Quora. Gartner’s research into business consumer support preferences in the digital workplace confirms that digital workers engage with colleagues for support questions before contacting the IT service desk. The research also revealed that asking peers for help both in person and via internet and social media sources were the most popular first-choice support channels. Although this is thriving outside of formal support practices, I&O leaders have been slow to formalize these channels within formal practices. Early movers are using collaboration portals and gamification to identify and reward knowledge, but this is a support channel that few I&O leaders have paid any attention to until recently, despite the large receptive audience. I&O leader interest in peer support has surged due to the increased shift to remote work due to the COVID-19 pandemic. Some IT service management (ITSM) tool vendors are beginning to provide features that facilitate peer IT support.

The position of peer support on this Hype Cycle represents formal peer support that is facilitated by I&O.

**User Advice:** Unofficial grassroots peer support happens in every company, but formalized Level 0 peer support is not suitable for every organization. Some business consumers prefer to contact only traditional support channels, and some business leaders don’t want non-IT staff to spend any of their own time working on IT issues. I&O leaders must analyze the preferences and requirements of the user community before proceeding. Seek out business unit IT support that is already
occurring in your organization, and identify pockets of knowledge within the employee community. Use the collaboration features in your ITSM tool or an already deployed enterprise social network or crowdsourcing platform to facilitate and track the interactions. Interface with the IT knowledge management (KM) processes to discover common issues and update the knowledge base where needed.

Identify valuable support activities that traditional reporting methods might miss (because they wouldn't hit the IT service desk), and take credit for facilitating the behaviors when justifying the performance of I&O to business leaders. Promote and reward collaborative behavior. Tools to support formalized Level 0 peer support are still emerging, so focus on simple activities for now. This is an alternative option that complements traditional support channels for low-urgency issues; it's not a replacement.

**Business Impact:** Business consumers are already going to their colleagues and crowdsourcing for support. IT service desks disrupted by pandemic-driven changes to the digital workplace that formalize these processes could benefit the most from successful, Level 0 peer support programs, because they can decrease the workload on the Level 1 and 2 support teams, reduce costs, and allow them to concentrate on other activities. Incident resolution (when measured from the initial interruption to service) can be expedited in cases in which the solution is simple, or when the expertise resides outside the I&O organization. When implemented properly, productive time is returned to business users, despite the perception that non-I&O employees might be distracted from their core duties. Consumer satisfaction with I&O can be improved by building engagement and trust.

**Benefit Rating:** Moderate

**Market Penetration:** 1% to 5% of target audience

**Maturity:** Emerging

**Sample Vendors:** Axios Systems; BMC; Broadcom; ServiceNow

**Recommended Reading:**
- "Don't Abuse Business Users for Peer-to-Peer IT Support"
- “8 KPIs That Demonstrate How Self-Service Initiatives Advance Your IT Service Desk”
- “3 Simple Ways IT Service Desks Should Handle Incidents and Requests”
- “2018 Strategic Roadmap for IT Service Management"

**Virtual Events**

**Analysis By:** Adam Preset

**Definition:** Virtual events bring large groups of people together online for short periods for defined purposes. Their organizers mix technology, content and format types to engage audiences in
varying experiences, ranging from few-to-many presentations to interactive activities. Audiences may be internal or external to an organization, or both. Planning, operations and production workstreams typically operate in parallel to execute complex events. Hybrid events add virtual, remote experiences to face-to-face events.

**Position and Adoption Speed Justification:** In-person events were once the norm, virtual events the exception. However, the COVID-19 pandemic has reshaped the event landscape. Organizations with operating models that depend on first-party or hosted events have had to switch quickly to virtual alternatives.

Many enterprises are holding virtual events for the first time in 2020, sometimes with the help of mainstream technology megavendors. However, although webinar solutions have been commoditized, there are few packaged end-to-end offerings for entire global events, which are complex undertakings. It will therefore take most organizations weeks or months to prepare for large internal company events or conferences for external audiences. Events that were once physical but are now virtual will likely stay either partially or wholly virtual from now on.

**User Advice:** Set event objectives. Then break virtual events down into components that can be delegated to different teams that will be able to focus on individual phases.

When planning the audience experience:

- Mix different content types and activities.
- Balance live and on-demand broadcasting with online interactive meetings.
- Use asynchronous interaction with attendees to support engagement across an event.
- Enrich presentations and meetings with live, moderated Q&A sessions, social channels, text chat, polling, crowdsourcing and gamification.
- Avoid scheduling virtual events according to the time constraints of traditional in-person events. Shorter sessions over partial, rather than full, days represent the new norm.

For event coordination:

- Get support from agencies, vendors or professional services organizations that have experience of running many virtual events. They have processes that do not need reinventing.
- Produce and gather content tied to the event’s objectives as early as possible. Provide agendas and prepare short videos that may be delivered just after the event registration process.
- Provide a simple, intuitive way for event attendees to select event sessions and move from one to another without friction.
For technical delivery:

- For events that are just several large meetings, check whether the platform you use for smaller meetings can scale up and whether it has the necessary features.

- Broadcast video for a few-to-many event, but use prerecorded, rather than live, video when appropriate to reduce the pressure on IT staff and presenters. Share recordings for on-demand replay for people who cannot join live sessions.

- If you need separate breakout rooms, either use a meeting solution with a breakout room feature or hold separate scheduled virtual meetings for breakouts and share links.

- Use virtual event vendors when you have multiple tracks, require a high level of engagement requirement or plan various session types.

- 3D virtual worlds and virtual-reality environments may attract attention, but use them only if the audience is ready for technical hurdles and a steep learning curve.

**Business Impact:** Virtual events may be booming, but their rise has profoundly adverse implications for the venues and services that have hosted physical, on-site events. Budgets have shifted.

Although some people regret the loss of in-person networking opportunities, the value of in-person meetings is being widely questioned. Without the expense and inconvenience of travel, workers can attend virtual events more easily — provided their employers give them the opportunity.

Event organizers must embrace virtual events. They will need multiple technologies, vendors and services to succeed at complex virtual events. Customers and vendors may describe a virtual event as a single thing, but behind it lie multiple requirements for project planning, software (for coordination) and technical delivery (such as webcasting). Each requirement, though related, is separate. Some providers eagerly meet demand for some requirements, but struggle with, or wholly neglect, others.

**Benefit Rating:** Transformational

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Sample Vendors:** EventMobi; Intrado; ON24; RainFocus; Vimeo

**Recommended Reading:** "Run Live Digital Workplace Webcasts and Town Halls That Electrify and Engage"

"General Manager Insight: If Your User Conference Is Disrupted by Coronavirus, It’s Time to Rethink the Virtual Conference"
XLA

Analysis By: Daniel Barros; David Groombridge

Definition: Experience-level agreements (XLAs) help drive better IT experiences by leveraging elements of digital experience monitoring (DEM), sentiment analysis and traditional service-level metrics that monitor the timeliness and effectiveness of supporting processes. The goal is to measure the end-to-end user experience within a given business process, and then be able to optimize it so that employees are continuously improving their technology experience in a wide variety of workspaces, including home offices.

Position and Adoption Speed Justification: XLAs are still in the early stages of maturity and adoption, and have not been traditionally measured, but organizations have found that focusing on the overall user experience drives higher user satisfaction and engagement. XLAs are currently mainly used in managed workplace services (MWS) deals, where client organizations seek to transform the employee experience. In these scenarios, clients want the service provider to agree to outcome-based metrics that go beyond timeliness in resolving tickets with a focus on the employee experience. XLAs aim to measure the end-to-end experience of a user in consuming the IT services necessary to perform their daily activities. In order to accurately measure this, XLAs usually rely on the implementation of DEM tools that are capable of measuring each touchpoint in the overall user journey, though they can also incorporate traditional user experience surveys. XLAs allow the impact of IT systems and services to be mapped directly onto business KPIs, allowing the creation of outsourced service deals that contract for defined business outcomes.

User Advice: Client organizations that need to enhance employee experience through digital workplace transformation should:

- Link technical service delivery to business KPIs by adopting XLAs with their service provider to measure and drive the desired user experience.
- Tie service revenue to improvement in XLA performance. Well-designed XLAs should also affect how the service is compensated. The overachievement of the target user experience should result in a premium, and the underachievement in a deduction. The premium and the reduction should be capped at an amount that is reasonable for both parties. However, having a financial incentive for overachieving the target is only effective for the client if the user experience metrics relate back to business performance.
- Ensure that XLAs measure end-to-end user experience by selecting providers with a strong track record in process mapping, analytics and digital experience monitoring. Down-select providers on the basis of their capability to demonstrate referenceable business improvement from
Business Impact: Any organization that is highly reliant on its workforce’s engagement and digital dexterity to drive success should consider adopting XLAs with its service providers — or develop their own. The key purpose of an XLA is to create meaningful user experience metrics that will be linked to business performance. The underlying metrics should measure individual factors that make up the user experience, such as:

- Network performance at the end-user device
- Performance of the applications that are relevant to the specific intended experience objectives
- Time to access needed applications
- User sentiment

The ability to measure these elements needs to be prebuilt by service providers. The decision of which specific metrics to use should be made through a professional services engagement to bridge the gap between the intended business performance improvements and the services that will be delivered and measured through the XLA metrics.

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: Atos; HCL Technologies; NTT DATA; TCS; Wipro

Recommended Reading: “Contract for User Experience When Outsourcing Managed Workplace Services”

“Getting Value From Employee Productivity Monitoring Technologies for Remote and Office-Based Workers”

“Market Guide for Digital Experience Monitoring”

Analysis By: Annette Zimmermann
**Definition:** Emotion artificial intelligence (AI) technologies (also called affective computing) use AI to analyze the emotional state of a user (via computer vision, audio/voice input, sensors and/or software logic). It can initiate responses by performing specific, personalized actions to fit the mood of the customer.

**Position and Adoption Speed Justification:** One of the benefits of detecting emotions/states is for a system to act more sympathetically. It creates anthropomorphic qualities for personal assistant robots (PARs), making them appear more “human.” This “emotional capability” is an important element in enhancing the communication and interaction between users and a PAR. People’s daily behavior, communication and decisions are based on emotions — our nonverbal responses in a one-on-one communication are an inseparable element from our dialogues and need to be considered in the human-machine interface (HMI) concept.

The first step in detecting human emotions is to define the different types of emotions, from angry, sad, happy and insecure. AI is a critical part of some, although not all, emotion AI solutions. Computer vision (CV)-based emotion AI requires a collection of imaging/video data and preparing it to be fed into an artificial neural network (ANN). Vendors using CV technology to detect emotions primarily apply convolutional neural networks (CNNs), a deep-learning technique.

Several new commercial deployments occurred in 2019 for emotion AI and new vendors entered the market. At the same time, we did not see any evidence for great advancements in technological capabilities. Therefore, the position of this profile on the Hype Cycle was stagnant.

There are several vendors, including Beyond Verbal, audEERING and Intelligent Voice, that have developed emotion AI systems based on audio analysis. Phonetic attributes and the understanding of words do not play a primary role here, and the most sophisticated systems are completely language-agnostic, including tonal languages. Vendors have developed algorithms that attribute the different pieces of sound waves to emotional states. The main type of neural networks (NNs) used for audio-based emotion AI are recurrent neural networks (RNNs).

Data quality (lab-based versus real-life data) and machine learning (ML) techniques determine the reliability of the technology to detect emotions. The better the data and the more data there is, the higher the probability of detecting different nuances of human emotions. Combinations of CV-based, audio-based and sensor-supported technologies make sense in certain use cases, but is not always required to gain a better result.

**User Advice:** As the market is currently very immature, most vendors are focused on two or three use cases in two or three industries. Hence, when selecting a vendor, it is important to review their capabilities and reference cases. As discussed above, the context and environment of the use case will determine the type of emotion AI to be used. Organizations should make lists of use cases that apply to them.

- Be use-case-driven. The use case will determine the emotion AI technology to be used and vendor selection.
At the same time, identifying and processing human emotion is currently a gray area, especially in the EU. The EU Commission has started an initiative to review the ethical aspects of AI technologies, and emotion AI will certainly be part of this debate.

**Business Impact:** Emotion AI technologies have already been adopted by various business functions in different industries, including call centers, PARs and high-end cars. CV-based emotion AI has already been used for more than a decade in market research — testing how consumers react to products and commercials. For about two years, many vendors have moved into completely new industries and use cases such as automotive, robotics, medical diagnostics, education and the public sector.

- Insurance companies are using audio-based emotion AI for fraud detection.
- In call centers, voice-based emotion AI can be used for intelligent routing for a better customer experience.
- Software exists that helps physicians with diagnosing depression and dementia.
- Dubai’s Road and Transport Authority (RTA) announced the use of CV-based emotion recognition in four of its “customer happiness centers.” When the “happiness level” among visitors drops below a certain threshold (maybe due to long queues) employees are notified and can act upon it.
- Inside the car, audio and CV-based emotion AI helps to understand what is going on and detects whether passengers are emotionally distracted.
- In retail, stores are adopting camera-based facial and emotional recognition to understand demographics and moods of visitors, enhancing the retail experience. Similar trends are emerging in the hospitality industry (in hotel lobbies) where cameras are used to recognize frequent guests and recognize their emotions.
- In education, we have seen prototypes of learning software that adapts to the user’s emotional state. Another opportunity is in training and workshops, where emotions of the training participants are captured to see how they are experiencing the training.

**Benefit Rating:** Transformational

**Market Penetration:** Less than 1% of target audience
Microapps

Analysis By: Jason Wong

**Definition:** A microapp is a discrete, yet reusable and portable, app function, process or workflow that operates within the context of a larger app or application — and also across multiple apps or applications. The microapp runs as a self-contained activity but may rely on services, such as identity services or access to location data, provided by an app client runtime or container. The microapp must be tightly scoped and is composed of UI, logic and data components typically bound to back-end microservices through a mediated API layer.

**Position and Adoption Speed Justification:** The term “microapp” is not new, but the architectural concept of microapps as part of a mesh app and service architecture (MASA) and applied toward multiexperience development (spanning web, mobile, conversational apps) is a recent phenomenon. Microapps have gained traction as part of a mobile app that individually and independently deploys them directly within a meta-app container of an installed mobile app (for example, “miniprograms” within the WeChat mobile app in China). The same microapp may also be used within other mobile apps, as well as in web apps and supporting conversational apps, such as a card UI within a chatbot interaction. Although they can run as headless apps, in the case of supporting a voice interaction, microapps are typically built on web technologies (HTML, CSS, JavaScript). Some vendors rely on specific client-side frameworks or proprietary runtime technologies to implement an architecture supporting microapps and enabling their reuse across digital touchpoints.

In recent years, the total number of vendors using the term microapp as part of their offerings has steadily increased. There has also been a steady increase in the use of microapp-based application architecture by consumer applications, such as Facebook Messenger and WeChat. These social media and messaging platforms enable third parties to create and distribute microapps within the main mobile or web app. Enterprise software providers, such as SAP and Citrix, are also enabling and delivering microapps for greater configuration of a multiexperience UX.

**User Advice:** Application leaders should encourage their teams to:

- Address the need to support ever-increasing digital experiences by using microapps to facilitate multiexperience development running on the mesh app and service architecture (MASA).
Business Impact: Key benefits of microapps include:

- Development agility and reuse, with an ability to develop functionality in isolation by different developers. However, you must design microapps as you would microservices, as both are used to form applications. Both are also fit-to-purpose, portable, reusable and accessible via APIs or notification.

- A consistent UX, as part of multiexperience development effort, encapsulating a task’s steps or workflow into a reusable component that supports a consistent UX across different touchpoints.

- Support for event-driven scenarios, to present an interaction to the user based on specific context.

- Composable experiences, to create targeted functions and workflows (e.g., expense approvals) as a single microapp that can be easily deployed into a web or mobile app for specific employees.

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: Betty Blocks; Citrix; Facebook; i-exceed; Progress; SAP; Tencent; Tiled; Workgrid Software

Recommended Reading: “Innovation Insight for Microapps”

“One Versus Many — When to Consolidate Your Enterprise’s Apps”

Employee Productivity Monitoring

Analysis By: Helen Poitevin; Rashmi Choudhary

Definition: Employee productivity monitoring technologies use automated data collection and analytics to report on employees’ activities, time spent, work locations and work patterns with a view to measuring and improving workforce productivity.

Position and Adoption Speed Justification: Employee productivity monitoring is not new. However, the digitalization of work has increased the ability to automatically track and monitor work
activities. In response to the COVID-19 pandemic, many organizations have needed to shift many of their employees to remote working very quickly. This has significantly increased the level of interest in employee productivity monitoring technologies.

Many solutions that offer employee productivity monitoring functionality were built for other purposes, such as endpoint or digital experience monitoring, insider threat detection and business process management.

The practice of monitoring employees for the purpose of improving productivity is rife with ethical challenges. It can easily cross the “creepy line” and may create a toxic work culture. It can also make organizations the subject of news articles decrying poor practices.

Furthermore, productivity is highly context-specific. Measuring the volume of activities and time spent is frequently a very poor proxy for measuring productivity and impact.

Adoption rates will therefore vary. They will be higher in contexts where many employees carry out relatively routine and standardized work. Examples include employees in shared service centers and customer contact centers and other frontline workers. In contexts where employees do a significant amount of nonroutine work, employee productivity monitoring may be unsuitable.

**User Advice:** Application leaders focused on the digital workplace and seeking to invest in employee productivity monitoring technologies must:

- Inform their investment decisions through careful investigation of the data sources, user experience design and initial use case for tools that offer employee productivity monitoring. Most of the technologies used to monitor productivity were not built for that purpose. The data they collect can vary significantly and may not be representative of the work that employees actually do.

- Ensure that the technology is implemented ethically by testing it against a key set of human-centric design principles. Mitigate risks by pursuing a careful communication strategy. Messaging should align with the enterprise’s response to the COVID-19 pandemic. Employees should be notified about the purpose of the data collection and how measurement is done — they must be able to see how it can benefit them.

- Consider carefully which worker populations will be within the scope of any monitoring efforts, and which populations will be excluded. The data collected may alternatively be used to improve the employee experience.

- Use a checklist to ensure that the purpose and scope of data collection is in line with how the data will be used and that it will help employees do their best work. Application leaders must be able to explain the purpose of measurement and the data and types of calculation methods used. They must be explicit about who will see what data in support of which kind of decision. They must carefully evaluate how employees are likely to respond and what impact the monitoring will have on them.
Business Impact: The significant increase in remote working as a result of the COVID-19 pandemic has generated substantial interest in employee productivity monitoring technologies.

When used to identify and alleviate the challenges that remote workers face, these technologies can improve both the employee experience and business outcomes. Insights derived from employee productivity monitoring technologies can help leaders make changes at the organization, team or individual employee level to improve overall productivity. In some instances, employees can benefit by improving their time management skills.

However, these technologies also pose a substantial risk. They can create a toxic environment if their deployment is perceived to indicate a lack of trust. An employer's public perception — and therefore its brand — can be damaged, if stories of poorly implemented and communicated tools reach the press.

For many organizations, the risks will outweigh the potential benefits. Many tools may therefore be decommissioned, once a first set of insights has been generated and analyzed.

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Adolescent

Sample Vendors: ActiveOps; ActivTrak; enaible; Fin Analytics; Hubstaff; Microsoft (Workplace Analytics); Nexthink; Sapience; WorkMeter; WorkPuls

Recommended Reading: “Getting Value From Employee Productivity Monitoring Technologies for Remote and Office-Based Workers”

“Market Guide for Digital Experience Monitoring”

“Market Guide for Employee-Monitoring Products and Services”

“Workforce Planning — How to Use Technology to Support Planning Processes”

Employee Experience Tech (EXTech)

Analysis By: Ron Hanscome

Definition: Employee experience technology solutions are a diverse collection of employee-facing solutions designed to influence and improve the employee experience and organizational culture. This spans worker interactions with HR, managers, teams and communities of interest/practice within work environments. Disciplines such as behavioral economics and positive psychology underpin solution design to maximize worker adoption and encourage embracing of a desired mindset and/or behaviors that align with the organization’s culture, values and objectives.
Position and Adoption Speed Justification: The need to attract and retain workers initially drove HR’s focus on optimizing the overall employee experience (EX) in 2019. The current COVID-19 pandemic and recovery landscape has added impetus to improve EX within the context of the abrupt shift to supporting remote work environments. HCM technology user experience (UX) is only one component of overall EX, but providers are now incorporating some EX principles in their application designs. Previous approaches focused on productivity and employee sentiment retrospectively and via highly structured job categories. Now, the challenge is to fully accommodate a more fluid future of work. To address this, EXTech solutions seek to increase adoption, engagement and performance through such elements as recommendations and nudges. Additional elements include mindfulness as well as connecting workers to others and to common purposes. EXTech concepts have appeared in various disciplines such as gamification, social responsibility, wellness, industry-specific WFM solutions, and social recognition tools. Some talent management and HCM suite providers are also attempting to incorporate these ideas into their solutions. This is despite their original system architectures having been designed when the focus was primarily on supporting HR practitioners and managers conducting people development tasks. The continued variety of approaches reinforces this concept’s emerging nature, although there has been increased provider development and end-user adoption over the past three years. These factors, together with increased resonance of the market with EX, have resulted in typical progression of EXTech in this year’s Hype Cycle.

User Advice: HCM EXTech solutions generally support multiple activities — such as regular feedback, coaching, encouragement, learning, competition, participation, personalization and recognition. These activities usually embed game-style mechanics to increase adoption. They may also allow employees to provide input on work-related factors, such as schedule quality, task best practices and working conditions. Workers may also be able to indicate impressions and provide feedback that can be used to determine relative levels of engagement. Teams may take accountability for their own team’s health and be able to raise certain work-related issues or point out organizational barriers to various management levels. These solutions can also cultivate a sense of purpose, belonging, or well-being by encouraging participation in an organization’s volunteer, social or wellness events. Since encouraging desired behaviors is the primary goal of these EXTech solutions, they may be embedded in daily employee activities, and adapted to various work environments.

Application leaders focused on HCM technology transformation should:

- Assess each solution’s underlying philosophy and design approach to determine fit for your culture and context. Be wary of HCM vendor marketing hype surrounding EXTech over the next two years, including claims that solutions will meet “requirements” that are often vaguely defined.

- Realize that the success of any EXTech initiative is more reliant on an employee-centric culture and mindset than technology. Any solution, even one that applies the latest neuroscience and AI-driven techniques, won’t be able to overcome a culture that can’t embrace a growth environment.
Carefully assess and pilot some of these solutions, concepts and techniques. Because EXTech solutions are still emerging, there is no commonly defined feature set, and their relative impact can differ greatly across different worker types and industries.

Deploy EXTech tools in such a manner that employees can quickly and clearly see the benefit for themselves, their teams and the overall organization.

Use leading design practices during implementation, including personas and employee journey mapping. This will help to ensure that deployed functionality actually improves the quality of the various interactions that make up the worker’s experience.

Make EXTech tools part of both the short-term response to the pandemic disruption and a longer-term strategy for developing a deeper relationship between organization and employee in a post-COVID-19 time frame.

Business Impact: After many years focused on trying to measure employee engagement, leading organizations have realized that it (along with retention) is fundamentally a downstream result of an optimized EX. Worker motivation and engagement are key in work environments that demand ever-increasing levels of innovation, creativity, imaginative problem solving and collaboration across teams. Disciplines such as neuroscience, behavioral economics and positive psychology have taught us a great deal about motivating individuals. EXTech solutions that use these techniques to support an ever-improving experience can help drive motivation and engagement, thus contributing to business performance and outcomes, and a broader pivot to a more agile culture. They can also help to improve the overall employment value proposition over time by better matching EX with the organization’s brand characteristics and ambitions.

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: BI WORLDWIDE; Centrical; Humu; Limeade; Reward Gateway; SelfDrvn; Unit4 (Intuo); WeSpire; Workhuman; WorkJam

Recommended Reading: “How to Harness Voice of the Employee Insights for Continuous Employee Experience Improvement”

“Employee Experience Primer for 2020”

“Improve Employee Experience to Drive Improvements in Customer Experience”

“Support Managers With Better HCM Tools to Improve Employee Experience”

“Cool Vendors in Human Capital Management Enhancing Employee Experience”
Data Literacy

Analysis By: Alan D. Duncan; Sally Parker; Donna Medeiros

Definition: Gartner defines data literacy as the ability to read, write and communicate data in context, with an understanding of the data sources and constructs, analytical methods and techniques applied, and the ability to describe the use case application and resulting business value or outcome.

Position and Adoption Speed Justification: Data literacy capability is a significant aspect of broader data and analytics maturity, and a core enabler of digital business. Businesses are not “data driven” with respect to decision making and value creation because the workforce do not “speak data” consistently.

Awareness and interest in data literacy are accelerating, with a growing number of commercial and educational organizations investigating, planning and delivering specific data literacy programs. However, for the past three years, respondents to Gartner’s Chief Data Officer Survey have ranked “poor data literacy” among the top three internal roadblocks to success. Currently, obstacles to more rapid and widespread adoption include relatively few common data literacy models/frameworks or industry standards, an absence of comprehensive data literacy programs and a piecemeal approach to training and certification.

Providers of data literacy service offerings are emerging to meet the rising demand. However, “data literacy” can mean different things to different providers, from enhanced data visualization skills to fostering curiosity about data more broadly. Consulting services, providers of self-service analytics and citizen data scientist software tools, and boutique firms will address the demand within the next 18 months. Universities are also expanding relevant courses to fill the talent gap and ready the next generation of workers with these essential life skills. The general rate of adoption may still be measured in years, however.

User Advice: Data and analytics leaders including chief data officers (CDOs) should begin with data literacy programs and workshops. These should include examples of the use of data storytelling and decision models to convert conversations into measurable business outcomes and value.

Pilot a mix of the following to get started:

- Raise awareness though storytelling. Start with a high-level awareness campaign to showcase the importance, meaning and value of data and analytics across the organization — from workers who don’t realize they are information workers, to executives who cherry-pick data in support of decisions already made.
Call out examples of "good" and "bad" data literacy to promote desired behaviors. Leverage humor and nonbusiness analogies to create a sense of inclusion and to demystify data literacy.

Pilot a data literacy skills program. Work with a group of stakeholders who already have enthusiasm and appetite for data and analytics and who recognize that improving data literacy is a necessary factor for success. Ideally, bring together cross-functional and multifunctional groups that share a common business outcome. These become your evangelists as you expand the program.

Collaborate with HR and line-of-business leaders to assess data literacy skills and training requirements, design upskilling roadmaps, create curriculum and determine training performance metrics.

Use data literacy assessments to factor in people’s current data literacy levels, competencies and desire to participate when inducting them onto the training. Contextualize training programs and embed on-the-job learning experiences based on users’ change readiness and capabilities.

Monitor the results of improved data literacy within the workforce by using data literacy assessments and by measuring associated improvements to data-driven business outcomes.

Work with third-party providers to plan data literacy programs that include deliberate training, coaching and awareness for data literacy skills across the workforce. Partner with your selected third parties to tailor such programs to suit specific line-of-business functions and roles (for example, marketing, sales, finance, frontline staff).

Services firms and software providers should align existing training and self-service enablement efforts with a broader curriculum and portfolio of data literacy offerings to meet the data literacy needs of both consumers and creators of data-driven solutions.

**Business Impact:** Developing data literacy is an imperative for any organization desiring to derive value from data and analytics. It is required across all industries, business domains and geographies, and will benefit any business process, role and decision where there is the opportunity to measure, manage and monetize data. Data literacy will impact all employees, from the boardroom to the break room, by becoming not just a business skill but a critical life skill.

Creators and producers of data, analytics and artificial-intelligence-based solutions will benefit from:

- A clear business context for analytics. This will help them understand how to ask a good question and apply critical thinking when developing solutions.
- A shared understanding of data sources, data quality and data elements across data types.
- An appropriate degree of understanding of the array of analytical methods available for measuring, monitoring and analyzing datasets in order to derive insight and inform decisions.
Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: Avado; Collibra; Data to the People; Gartner Consulting; Pluralsight; Qlik; Skillsoft; Tableau; The Data Lodge; Tuva

Recommended Reading: “How Chief Data Officers Show Leadership in Improving Data Literacy and Fostering a Data-Driven Culture”

“Tool: Communicating the Need for Data Literacy Improvement”

“Data Literacy Providers Will Accelerate the Time to Value for Data-Driven Enterprises”

“Toolkit: Data Literacy Individual Assessment”

“Toolkit: Data Literacy Organizational Assessment”

“Toolkit: Curriculum for Data Literacy Training Programs”

At the Peak

Bring Your Own Thing

Analysis By: Nick Jones

Definition: Bring your own thing (BYOT) refers to individuals using personal Internet of Things (IoT) devices or wearables at work, because they provide value in terms of convenience or productivity. BYOT will involve a wide range of objects, such as fitness bands, smart lights, air filters, wireless webcams, voice assistants, smart ear buds, remote-controlled power sockets, consumer virtual reality (VR) headsets, drones or coffee machines. In the long term, it will include highly sophisticated devices, such as self-driving cars and domestic robots.

Position and Adoption Speed Justification: BYOT is immature, and, in 2020, few consumer “things” are found in workplaces. However, as homes and domestic technology become smarter, and consumers acquire more personal IoT, a growing range of personal things will be brought into offices or be used to support remote working. This is because they’ll provide new and more convenient ways to perform tasks or improve the working environment. Future technologies such as embedded artificial intelligence (AI) will enable things to become more intelligent and easier to use. This will increase the demand for BYOT.

The maturity of BYOT has increased only marginally since Gartner’s 2019 Hype Cycle because one impact of Covid has been to reduce the number of office-based workers and, hence, the
opportunities to bring home technology into the workplace. However, in the longer term the growth in remote working may drive new BYOT applications (e.g., the use of social robots). Overall, BYOT will be a diverse domain that will increase through 2025, as the range and capabilities of consumer IoT devices grow, and as employees find new ways to exploit them to support work.

**User Advice:** Organizations will be affected by BYOT in two main ways. First, as an opportunity to improve productivity and usability, or to enhance the working environment (e.g., the use of voice control technologies for better user experiences or to enable no-touch interactions). Business-oriented tools such as Amazon’s "Alexa For Business" will make it more practical for technology and service providers to create more enterprise-oriented versions of consumer user experiences and products to provide alternatives to BYOT. BYOT will eventually be as unstoppable as bring your own device (BYOD).

Second, as a security and compliance risk. BYOT will pose new security risks for organizations, as consumer “things” can be an attack pathway into devices such as smartphones or corporate wireless networks. Also, information may leak through the use of public services such as voice assistants to control things. In the longer term, consumer devices may provide unexpected attack paths, e.g. robots observing workers typing passwords. BYOT is as much a social as a technical issue, so organizations must educate users about the risks and establish a culture of individual responsibility that is augmented by technical measures where possible. Organizations that want to support BYOT should provide a separate Wi-Fi service set identifier (SSID) for staff to connect smart objects to an isolated network partition.

Many BYOT security challenges can't be managed technologically, because there are no tools equivalent to the enterprise mobile management products used in the BYOD and “bring your own application” domains. However, technologies such as network monitoring, DNS monitoring and cloud access security brokers (CASBs) may help CIOs and infrastructure and operations (I&O) leaders understand where BYOT is occurring. We also expect security vendors to introduce products that are better able to monitor and control BYOT activity.

Organizations should monitor BYOT usage, because it may suggest opportunities to adopt new devices or working practices to improve quality of life or productivity.

**Business Impact:** Personal convenience will be a major driver for BYOT, so business benefits will be somewhat limited in the medium term. However, even in 2020, technologies such as smartwatches, air filters, personal smart lighting, smart ear buds, or fitness bands might help workers be more effective or more comfortable, albeit somewhat indirectly. In the longer term, some BYOT devices will enable new working practices.

**Benefit Rating:** Moderate

**Market Penetration:** Less than 1% of target audience

**Maturity:** Emerging
**Sample Vendors:** Amazon; Apple; D-Link; Google; Panasonic; Philips; Samsung

**Recommended Reading:** “Alexa for Business: B2B/B2E Disruptor Profile”

“Use Sensors and Multimodal Interactions to Differentiate UX in Connected Home Solutions”

“Forecast: Wearable Electronic Devices, Worldwide, 2018”

“Technology Investments for Frontline Workers Will Drive Real Business Benefits”

**Voice of the Employee**

**Analysis By:** Ron Hanscome

**Definition:** Voice of the employee (VoE) solutions collect and analyze employee opinions, perceptions and feelings related to their experience. They use engagement surveys, feedback tools and other data sources to gather employee sentiment and infer preferences, opinions and well-being. VoE solutions deliver insights with actionable guidance to help improve employee engagement, experience, productivity and performance. They can become a key element of a firm's “sense and respond” feedback loop when connected with HCM and digital workplace technologies.

**Position and Adoption Speed Justification:** Gartner clients are struggling to respond to the rapid pace of change (both internal and external) and the associated effects on their employees from ongoing digital transformation. Many organizations continue to utilize a formal annual engagement survey as the primary means of gathering feedback from employees. Therefore, they have difficulty tracking the effect of more frequent changes in perception as their employees react to organizational changes and external market events. Many organizations have begun augmenting annual surveys with pulse, forum-based indirect and inferred feedback tools to better capture ongoing employee perceptions, feelings, opinions and ideas.

While there has been substantive acquisition activity over the past four years by major providers to either develop or augment capability, no VoE solution yet supports all the needed data collection and analytical methods. In addition, the market has yet to coalesce around a more standardized set of capabilities for VoE processes, enabling technologies, and services. While VoE remains early on the HCM Hype Cycle, the increasing number of vendors embedding it in their offerings has driven increased market interest. The immediate, urgent and forced transition to remote work environments during the first half of 2020 has become an equally compelling driver of end-user demand. Organizations now want to use VoE to communicate care, listen to employee concerns, prioritize investments and quickly take action where necessary. Regardless of the uneven pace of economic recovery by geography and industry, VoE solutions will see increased market interest over the next five years at a minimum, as a more continuous approach to employee listening will be more critical than ever before. These factors have resulted in a quicker progression for VoE in 2020.
**User Advice:** Application leaders tasked with transforming HCM should help HR and business leaders to:

- Adjust your VoE strategy to accommodate faster HCM and business decision timelines, including choice of metrics and measurement intervals.
- Determine what types of VoE “listening” are desired (direct survey-based, focus group-based, indirect) and how much weight will be given to each type. No VoE solution fully supports all types of VoE listening, so integrating multiple providers will be a common outcome.
- Define the degree to which managers will be taking an active role in VoE listening. Also, assess the readiness of the organization to tightly link VoE to other talent processes or work activities. Results of these two tasks will help drive tool selection.
- Select the right data sources, collection/measurement methods, and enabling technology options. Assess how well the provider applies techniques like NLP and event-triggered listening.
- For innovations, evaluate and implement appropriate enabling technologies on a pilot basis, and listen to early feedback from employees and managers. Be prepared to swap out technology components quickly, based on changing business needs and maturity of options.
- Make VoE initiatives actionable by equipping stakeholders to respond quickly to anonymized, aggregated insights coming from VoE data.

**Business Impact:** More comprehensive collection and analysis of employee feedback combined with actionable guidance can result in:

- Earlier problem identification and improved responsiveness due to expedited data collection and direct delivery of insights and recommendations to managers.
- Deeper feedback for managers on team perceptions and performance.
- Better data for longitudinal analysis.
- Improved employee engagement and retention.
- More efficient idea management.

Over the longer term, a VoE approach can contribute to improving an organization’s overall employee experience and employment value proposition. This is because potential employees are more likely to be attracted to a work environment where their voice is heard. VoE also has the potential to improve workforce performance and productivity over time.

**Benefit Rating:** High
Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: Confirmit; Culture Amp; Glint; Humanyze; Peakon; Perceptyx; Qlearsite; SAP Qualtrics; Ultimate Software; Willis Towers Watson

Recommended Reading: “2019-2021 Strategic Roadmap for HCM Technology Investments”

“Measuring Employee Engagement: Past, Present, Future”

“How to Harness Voice of the Employee Insights for Continuous Employee Experience Improvement”

“Market Guide for Voice of the Employee (VoE) Solutions”

Digital Experience Monitoring

Analysis By: Federico De Silva; Charley Rich

Definition: Digital experience monitoring (DEM) technologies monitor the availability, performance and quality of experience an end user or digital agent receives as they interact with an application and the supporting infrastructure. Users can be external consumers of a service, internal employees accessing corporate tools or a combination of both. DEM technologies seek to observe and model the behavior of users as a continuous flow of interactions in the form of “user journeys.”

Position and Adoption Speed Justification: Digital experience monitoring continues to evolve from a reliance on independent tools and technologies, which traditionally focused on metrics of single applications, toward a more holistic approach that measures the effectiveness of the interactions users have in relation to business outcomes such as retention, risk and revenue. DEM solutions are evolving from focusing purely on availability and performance toward helping organizations optimize and improve digital business outcomes by addressing three key topics:

- What they monitor: Availability, performance, security and quality of the application, and all of the components that may impact the end-user experience
- Who they monitor: External customers and partners who drive revenue for the organization, internal employees (particularly in a rapidly changing workplace), and digital agents as key actors in distributed application ecosystems
- Why they monitor — To enable the proactive monitoring of business outcomes and to connect technology with business KPIs

While DEM is a critical component of a comprehensive IT monitoring strategy, it can be implemented and connected in parallel to other IT monitoring technologies. End-user customers
can leverage the maturing capabilities of the components of DEM:

- Synthetic transaction monitoring
- Real user monitoring, including session replay
- Endpoint monitoring

Integrating the technologies can help to create a more comprehensive analysis of the customer experience and, ultimately, of the impact on the organization or business. This becomes critically important as more applications and workloads move to the cloud and IT organizations lose control of the components of the applications and services.

DEM plays a similar but complementary role to web and digital experience platforms. Web analytics and other IT monitoring technologies (APM, ITIM, NPMD, AIOPs) are part of the broader monitoring strategy. Organizations are able to have a more complete view of how users — internal, external, partners and more — are affected and impacted by the performance of their applications, and to troubleshoot accordingly. DEM is increasingly being integrated earlier in the software development life cycle as part of testing (via synthetic transaction monitoring, real user monitoring [RUM], etc.) within DevOps environments.

Improving and ensuring employee productivity is another important objective of DEM. And though there is considerable uncertainty surrounding COVID-19’s impact on the future of work, Gartner expects that the “new normal” will require significant changes to I&O’s monitoring strategy for employees (see “Use DEM to Understand and Enhance Your Employees’ Work-From-Home Experience”). In this respect, DEM can be achieved through endpoint monitoring with the deployment of a local agent installed on a device (whether physical or virtual). Endpoint monitoring solutions also help monitor COTS and VDI platforms, such as SAP and Citrix environments.

**User Advice:** Organizations should deploy DEM technologies to create holistic views of a user’s digital experience. To do so, organizations should use a combination of data sources:

- **Endpoints:** Agent-based instrumentation to understand the performance of applications from the perspective of the end user on a mobile device or PC.
- **Real user monitoring:** JavaScript that is injected into web applications to collect data such as response time, latency and errors or alternatively via plug-ins when HTML is not accessible in the case of SaaS applications. Session recording and replay shows what the user experienced during an application session, which the IT monitoring teams can correlate with other application performance metrics for RCA.
- **Networks/internet:** Analysis of packet and flow data to understand the impact of the network’s performance on user experience. This includes monitoring voice over IP (VoIP) network traffic.
Organizations should also complement the above data sources with social media analytics, NPS scores, ITSM data to correlate user-derived tickets to system performance and user experience, as well as the analysis of API performance as applications interact with each other.

**Business Impact:** Organizations that implement DEM tools can not only benefit from better application performance and improved user experience, but also ultimately improve business outcomes in support of digital transformation. This will require IT organizations to consider nonhuman agents in their analysis of interactions among customers, suppliers, partners and observers; they may exhibit different behaviors and operate on different time scales. With an expanded remote workforce, organizations will need to tie DEM to employee productivity and digital workplace initiatives to achieve the rapidly changing business objectives as a result of COVID-19 (see “Getting Value From Employee Productivity Monitoring Technologies for Remote and Office-Based Workers”).

**Benefit Rating:** High

**Market Penetration:** 20% to 50% of target audience

**Maturity:** Early mainstream

**Sample Vendors:** Apica; Aternity; Catchpoint; GSX; ITRS Group; Lakeside Software; Nexthink; Quantum Metric; Rigor; ThousandEyes

**Recommended Reading:** “Magic Quadrant for Application Performance Monitoring”

“Market Guide for Network Performance Monitoring and Diagnostics”

“Market Guide for Digital Experience Monitoring”

“Broaden Application Performance Monitoring to Support Digital Business Transformation”

**Knowledge Graphs**

**Analysis By:** Stephen Emmott

**Definition:** Knowledge graphs are data structures within which disparate data about entities (people, companies, digital assets, etc.) is codified as a graph — a network of nodes (vertices) and links (edges/arcs). This enables information (“knowledge”) to be located (knowledge graph as an index) or synthesized (knowledge graph as a data source).

**Position and Adoption Speed Justification:** Google’s Knowledge Graph, Facebook Social Graph, LinkedIn Graph and Microsoft Graph are evidence of the growing popularity of knowledge graphs due to their ability to encode and interrelate disparate data, whether structured or unstructured, at Synthetic transaction monitoring (STM): Synthetic transaction execution records to simulate user interactions with applications leveraging RUM data to create most natural conditions.
source. All use knowledge graphs to enhance the relevance of search, and provide information “cards” that are synthesized directly from their graphs. This supports collaboration and sharing, search and discovery, and the extraction of insights through analysis.

Specialist vendors offer graph-based capabilities that support the creation and management of knowledge graphs that can serve a range of use cases within the enterprise. Products in a variety of markets — such as text analytics, insight engines, and metadata management solutions — also utilize or are based upon knowledge graphs.

Knowledge graphs are entity-centric applications of graph technology. They are modelled using an ontology which must be defined and instantiated by encoding data sourced either within or external to the enterprise. Embedded within cloud offices services, and increasingly other application categories, most enterprises will have — in some form or other — knowledge graphs in operation. However, few enterprises are building their own, or taking ownership of what they have. While awareness is growing, purposeful utilization and a strategy for attaining this is lagging, hence the ascent toward the Peak of Inflated Expectations coupled with a long time to the Plateau of Productivity.

User Advice: IT leaders should approach knowledge graphs as databases for storing data about entities and their relationships. This is especially so where the data has many different sources and forms, such as documents in a content services platform, updates in a data feed, audio from a video, or tables in a database. Where data is unstructured (for machines), use AI to extract and structure data.

Application leaders should collaborate with data and analytics leaders to identify the knowledge graphs already in operation within their applications portfolio. IT leaders responsible for data and analytics must include knowledge graphs within the scope of their data and analytics governance and management. To ward against perpetuating data silos, investigate and establish ways for multiple knowledge graphs to interoperate. This is likely to extend to third party data knowledge graphs.

Ensure data and analytics staff are familiar with knowledge graphs and the technology used to support them including graph query and analysis. Developing competence requires embracing ontologies, to define and describe how knowledge graphs should be structured and constrained. Venture forward through the use of a suitable pilot project that delivers tangible value for the business, but also learning and development for data and analytics staff: an opportunity to distinguish graph- from RDBMS-based approaches.

IT leaders should gain access to their knowledge graph(s) so as to be accessible for inspection and management. In particular, facilitate access for subject-matter experts within the business so they can moderate the data and contribute to its modelling. Beyond “received” knowledge graphs, you should identify use cases where there is a need for custom-made knowledge graphs and evaluate products that facilitate this.
Business Impact: Organizations can expect significant value from knowledge graphs. They have the potential to impact all business function and industry domains. However, as an entity-centric databases, they will primarily be the concern for IT, especially data and analytics.

Business units will be impacted through the applications that benefit from knowledge graphs — such as insight engines to help discover and retrieve insights. They will also work directly with knowledge graphs through the involvement of their subject matter experts responsible for authoritative data.

Key use cases for knowledge graphs have emerged in:

- Digital workplace (e.g., collaboration, sharing and insight);
- Automation (e.g., ingestion of data from content to RPA);
- Supporting machine learning (e.g., augmenting training data);
- Data analysis (e.g., augmented analytics especially in the context of business intelligence reporting and cybersecurity);
- Digital commerce (e.g., product information management and recommendations); and
- Data management (e.g., metadata management, data cataloging, and data fabric).

Key to the long-term success of knowledge graphs is enabling data within organizations to be interoperable with external knowledge graphs so as to enable the ingestion, validation and sharing of ontologies and data relating to entities e.g., geography, public institutions and events, etc.

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Adolescent

Sample Vendors: data.world; Diffbot; Franz (AllegroGraph); Mining Lamp; Neo4j; Ontotext; Semantic Web Company (PoolParty); Sisense; Stardog; TopQuadrant

Recommended Reading: “Top 10 Trends in Data and Analytics, 2020”

“Augmented Data Catalogs: Now an Enterprise Must-Have for Data and Analytics Leaders”

“An Introduction to and Emerging Use Cases for Natural Language Processing”

“An Introduction to Graph Data Stores and Applicable Use Cases”

“Financial Data Strategy and Knowledge Graphs”
Smart Badges

**Analysis By:** Tracy Tsai

**Definition:** Smart badges are miniaturized integrated circuit cards, as well as wristbands or other wearable form factors, that have built-in sensors and the ability to transmit data wirelessly. Examples of sensors are infrared sensors, accelerometers, microphones and scanners. Unlike access management smart cards or smart IDs, smart badges are wearable devices that provide advanced features, such as location-based contextual services and analytics, to improve workplace communication and operational efficiency, and employee well-being and performance.

**Position and Adoption Speed Justification:** The adoption of smart badges continues to grow due to the benefits of customizable context, easy-to-see large display, added security functions and employee convenience. A common use case is security authentication for single sign-on (SSO) within organizations for access control. With E Ink’s technologies, smart badges for event visitors can be repeatedly used with customizable context on smart badges’ display. Other than identification and authentication, using smart badges for mobile payments provides added convenience to employees. Emerging organizational use cases focus on increasing efficiency, workplace accessibility, employee safety and improving employee performance. Smart badges enhance employee experience at workplaces, which results in higher employee retention. Employees’ user experience can be applied in many other situations, i.e., patient, customer, etc. Smart badges for employee analytics record and transmit data about employee movement, interaction with colleagues, communication patterns and how energetically employees are engaged in group discussion. Companies can analyze this data to propose improvements to organizational communication and to quantitatively evaluate efficiency. Employees can use the analytics to achieve their personal goals by comparing with benchmark levels. Another area of potential benefit (yet difficult) is the ability to easily integrate with sources of data across the enterprise, environment and third-party systems. To analyze employees’ specific situation through multiple sources of data in real time, it will still take time for the innovation profile to become mainstream.

**User Advice:** IT leaders should evaluate smart badges to determine if they enable data analytics that improves organizational effectiveness. IT leaders should work with line of business (LOB) leaders to identify which of their issues and objectives can be assisted by apps for smart badges. Because badges are worn by employees in the workplace, they can be an effective endpoint device for tracking location, authentication, scanning product codes, checking information, monitoring task status and more. Examples of use cases are:
When implementing smart badges, clearly explain how employee privacy is protected. Companies need to let employees understand in advance what’s being tracked and analyzed in order to maximize participation.

**Business Impact:** Smart badges are emerging as a new endpoint device for the connected worker. They not only provide value beyond authentication, making it easier for employees to access information, but can also be part of new approaches to increase digital workplace effectiveness and efficiency. The overall business impact can be high to transformational by enabling new ways of doing business across vertical industries.

**Benefit Rating:** High

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Sample Vendors:** E Ink; Group Dynamics; Hitachi; Humanyze; Microchip Technology; Realtek Semiconductor; SoloProtect; Zebra Technologies

**Recommended Reading:** "Magic Quadrant for Indoor Location Services, Global"

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- **Restaurants** — POS systems require bartenders and waitstaff to swipe a card to access them but smart badges do not have to be swiped, thus saves time. Instead, the worker is identified when in close proximity. Choose smart badges that detect when they are being worn and require workers to reauthenticate themselves if the badge (or wristband instead of badge) is removed.

- **Healthcare** — Smart badges can provide location-contextual services to staff for improving quality care. For example, alerting the nearest available staff member on where to go when urgent help is needed.

- **Event management** — Smart badges give organizers a new level of insights about what occurs at their events, the attendees, and visitors and can provide more personalized experiences. For example, attendees can check the event schedule directly on the smart badges and the organization can change the display context for a notification or a new information update if there is any change in the meeting schedule. Smart badges can work seamlessly with event organizations’ smart kiosks and smart devices, enabling consumers to log in and view meeting content that is customized for each person. Career Zoo’s smart badging system allows delegates and exhibitors to share content with each other. Their data can be used for analysis that helps avoid crowds in certain areas for better safety and enhanced customer experience.

- **Retail** — Improve the customer experience by being able to immediately check price or inventory with the smart badge.

- **Construction** — Fall sensors can be integrated into the badge to alert management or monitoring services.

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Workplace Analytics

Analysis By: Dan Wilson

Definition: Workplace analytics are aggregated insights derived by analyzing contextual data from applications, users, endpoint devices, processes and networks to improve technology usage/ adoption, employee engagement, user experience, system performance and behaviors that promote collaboration and productivity. Data is collected through application APIs/SDKs, unified endpoint management (UEM) tools and specialized agents installed on endpoints.

Position and Adoption Speed Justification: Workplace analytics remains in the Peak of Inflated Expectations, and is growing in availability from feature inclusion in UEM and similar tools. While mostly used by IT and HR, line of business leaders are now using workplace analytics to measure and improve teamwork and overall performance. Workplace analytics tools can provide insights at various levels — device, employee, team/department and organizationwide. Key challenges are the heterogenous mix of data sources, inconsistent data aggregation methods, differences in metric definitions and calculation methods, varying expectations by role, and compliance with privacy norms and regulations.

Pre-pandemic, Gartner saw steady interest in an objective approach to measure and improve the related categories of employee experience, engagement, collaboration and productivity. The shift to mandatory remote work increased interest in providing insights into employee sentiment, but staff and budget limitations will delay adoption.

User Advice: Although most tools currently use basic email/calendar metadata, integration with UEM and digital experience monitoring (DEM) tools are driving additional workplace analytics capabilities. These include executing synthetic transactions, measuring application execution time, collecting event logs from endpoint devices and pulling customer satisfaction data from IT service management tools. Gartner anticipates continued expansion into enterprise social collaboration platforms, conferencing and collaboration tools, license management tools, and SaaS management platforms. Large enterprises with broad technology portfolios see the most value in gaining visibility into data that has traditionally been difficult to gather without advanced scripting, remote controlling into devices or pulling reports from multiple consoles. The most common requirements include:

- Monitoring the adoption of technology, practices or new ways of work
To maximize the benefits of workplace analytics, application, digital workplace, HR and I&O leaders must:

- Consolidate and align requirements to corporate objectives.
- Minimize potential legal and compliance issues by involving those departments in plans to implement tools.
- Investigate capabilities that are available or on the roadmap of already-owned DEM, UEM and other monitoring tools, and partner with strategic vendors to expand capabilities before buying other tools.
- Avoid comparing scoring/progress with other companies and across tools; rather, establish and measure changes internally.
- Clearly communicate to employees that these are not surveillance tools.

**Business Impact:** Workplace analytics help aggregate disparate data sources (input) and the use of AI/ML to generate meaningful decisions (output). For example, with workplace analytics, it is possible to identify a collaboration and employee satisfaction issue caused by meetings being repeatedly scheduled outside of working hours for one or more parties in a remote workforce that crosses multiple time zones. Workplace analytics enable organizations to:

- Measure teamwork and collaboration at and across various organizational levels
- Personalize services and technology to different worker segments
- Identify gaps and opportunities in process, skill set and technologies to establish an instrumented workplace
- Measure employee engagement by analyzing work patterns between teams on cloud office and workstream collaboration platforms
- Extend the digital workplace to frontline workers with added transparency into device and application experience
Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: 1E; Aternity; B2M; GSX; Lakeside Software; Microsoft; Nexthink; StatusToday; SWOOP Analytics; VMware

Recommended Reading: “Getting Value From Employee Productivity Monitoring Technologies for Remote and Office-Based Workers”

“Use DEM to Understand and Enhance Your Employees’ Work-From-Home Experience”

"Operationalize an Instrumented Workplace With Analytics to Support Digital Business”

“Eight Steps for Modernizing Employee Communications in the Digital Workplace”

“Enablement Mindset Is the Missing IT Ingredient to Improve Workforce Digital Dexterity and the Employee Experience”

Smart Workspace

Analysis By: Gavin Tay; Annette Jump; Rashmi Choudhary

Definition: A smart workspace exploits the growing digitalization of physical objects brought about by the Internet of Things (IoT) to deliver new ways of working, scheduling resources, coordinating facility services, sharing information and collaborating. The programmability of physical environments enables smart workspaces to work contextually with mobile devices, software applications, enterprise social graphs and artificial intelligence (AI) to improve workforce efficiency and effectiveness. Any location where people work can be a smart workspace.

Position and Adoption Speed Justification: Digital workplace strategies that focus on facilities modernization, more agile work environments and the value of employee experience continue to shape interest in smart workspace technologies. We see synergies between 10 trends:

1. The IoT
2. AI-related technologies
3. Digital signage and electronic whiteboards
4. Indoor mapping
5. Smart buildings, including trends in integrated workplace management systems (IWMS)
6. IWMS platforms (as they move into IoT-based services)
A smart workspace is a key aspect of a digital workplace initiative, as it includes strategists involved in facilities and real estate as key stakeholders. It applies to physical environments such as:

- Building and campus environments, including in-building open spaces
- Co-working spaces
- Office and desk spaces
- Conference rooms
- Huddle rooms (small spaces where people congregate)
- Retail and shop floors
- Manufacturing assembly lines
- Home spaces (workspace resulting from instituted remote work given COVID-19)

“Things” participate in a smart workspace. Examples include applications and devices such as electronic whiteboards, building interfaces (HVAC), large digital displays, smart badges, workstations, mobile devices and wearables.

As workers return to work post COVID, we’ll expect organizations to take full advantage of a smart workspace. It will require organizations to revisit design strategies to include methods for gaining a better understanding of how people participate in physical spaces or adhere to social distancing. Such insight can create new capabilities related to seating and room allocation, access management and wayfaring.

Adoption rates will vary based on organizations’ requirements to support flexible work models that optimize the physical and interactive aspects of places and things (as well as employees' privacy concerns).

**User Advice:** Enterprise strategists focusing on a digital workplace strategy and digitalized business processes should follow smart workspace trends and look for deployment opportunities, such as meeting rooms, huddle rooms and in-building open spaces. Emerging applications will expand beyond traditional productivity scenarios to include situations that are more industry- and
process-specific. Examples derived from COVID-19 include: an insurance professional using a remove digital pen that interacts directly with back-end processing systems; or a patient being remotely monitored via a wearable interface in their home that interfaces with diagnostic systems and advises healthcare professionals to improve care delivery. IT organizations will need to work much more closely with real estate and facilities teams, and vice versa. Identity, access management, privacy and security teams will also play a critical role. Anonymizing data is key to safeguard privacy expectations and help promote adoption of new services.

Additionally, electronic whiteboards are becoming integrated with traditional collaboration and content software systems, providing more opportunities for experimentation. Meeting artifacts can be better captured and connected to digital workplace graphs, to become more widely searchable. Beacons and sensors placed in key locations within a workplace can interact with mobile apps to deliver personalized information to workers, based on proximity. These can be used to improve employee learning, provide relevant information on products, or communicate safety procedures based on employee location. As workers return to work post COVID 19, contactless authentication using facial recognition and QR code scanning will become the norm.

The smart workspace will emerge at an uneven pace as organizations prioritize potential solutions independently of one another. For instance, building upgrades may take longer than expected, and some market sectors will be laggards in terms of smart workspace adoption. Localization needs will also influence smart workspace adoption.

**Business Impact:** Instituted remote working resulting from COVID-19 has diversified smart workspaces even further. They now span home spaces, to improved employee productivity and cultural perception of the workplace by workers, to improved customer experience as employees make better use of smart workspaces to serve clients. The results of these changes will often be a reduction in cost because office utilization data will guide decisions about what types of workspace are most conducive to employee effectiveness.

The digitalization and programmatic evolution of places and things will impact IT methodologies related to system design, requiring new skills for design teams to understand how people use places and things. Smart workspaces will also have organizational impacts as traditional software teams now need to work with facilities management teams in ways not previously envisioned. The digitalization and programmability of the workplace will create new integration opportunities. For instance, smart workspace activities will signal information to digital workplace graphs and smart machines, and vice versa.

**Benefit Rating:** Transformational

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent
Content Integration Services

Analysis By: Marko Sillanpaa

Definition: Content integration services are technologies that provide a single point of access, common functionality and consistent governance to dispersed and disconnected content repositories. This goes beyond search of external repositories, offering bidirectional integration, content editing and other functional capabilities for remote content sources.

Position and Adoption Speed Justification: Development of uncoordinated content-centric solutions to solve various specific business problems has created numerous content silos. When combined with entrenched content services platforms, it creates a complex sprawl of disjointed content silos. Content integration services have emerged to address this uncontained sprawl. Vendors have approached this in different ways:

- Content services platform vendors — These vendors are typically focused on a common set of cross-vendor functional capabilities, including workflows and modern integrations for business users.
- Records management vendors — These vendors are typically focused on records and retention controls to multiple, disparate content repositories from a central console. They often provide more functionality than the source repositories they manage.
- Content migration vendors — These vendors provide a variety of integrations on a core platform based on configuration. They provide high-performance migration with audit capabilities.

While previous attempts at standardizing content integration services were met with limited acceptance, this new wave of content integration technologies is starting to take hold. Content services platform and records management vendors are implementing content integration services to provide “manage in place” capabilities with other repositories. Content migration vendors are
provisioning and maintaining a comprehensive set of connectors for the ever-growing number of repositories.

Content integration services has reached the Peak of Inflated Expectations but its journey through the Trough of Disillusionment is dependent on a few factors. For example, while organizations are adopting CIS, case studies are lacking. Also, due to expected budget pressures in the third and fourth quarter, organizations will look toward platform consolidation to reduce costs.

**User Advice:** Application leaders should:

- Look to content integration services as a pathway to consolidation of content silos expected to occur in Q3/Q4 to address cost constraints. Content integration services can provide access to legacy systems for migration purposes.

- Be aware that many of the products in this sector are new and therefore entail some implementation risk. Kick-start repository integration programs with proofs of concept or pilot initiatives and tackle top “x” use case that covers most of the requirements needed. Prioritize vendors that focus on providing a layer of abstraction to eliminate the need to develop connectors as a new repository or version appears.

- Ensure that the vendor’s integration service matches the primary focus of your business requirements and not the vendor’s “future plan.” A platform that is primarily aimed at information governance is not a good match for integrated BPM requirements, and vice versa. Determine high-priority business requirements for the integration and select vendors that address those requirements as a primary function.

**Business Impact:** Content integration services provide the ability to pull together many sources of content within an organization and impact its content services strategy. Using content integration services, organizations will achieve a more agile content strategy that enables best-of-breed, business-focused technology selection. And one that provides managed access to all content and holistic information governance capabilities from a central location instead of a single platform approach, which has been unsuccessful to date.

Connecting content sources and providing distributed access to end users in a seamless manner provides many benefits, such as increased regulatory compliance and access to analytics and machine learning. As a result, content integration services will support innovation, governance and cost reduction initiatives by optimizing information assets for availability.

**Benefit Rating:** High

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent
Sample Vendors: Alfresco; AvePoint; Egnyte; Everteam; IBM; M-Files; Nuxeo; Objective; RecordPoint; SER Group

Recommended Reading: “Control Content Sprawl With Federations”

“Reinventing ECM: Introducing Content Services Platforms and Applications”

“What You Need to Know About Content Services Platforms”

“Extend Content Services Platforms With Applications and Components to Meet Business-Specific Needs”

Digital Adoption Solutions

Analysis By: Melissa Hilbert

Definition: Digital adoption solutions improve adoption of multiple tools across the organization. The software walks a user through business processes across multiple products, providing a consistent user experience, eliminating in some cases, manual entry, and providing visually clear paths to complete tasks. It enables employees to be onboarded faster and improve productivity. Sales, HR, ERP and digital workplace are key use cases but this technology applies to all functional areas in an organization as well as external products sold by an organization.

Position and Adoption Speed Justification: Digital adoption solutions are evolving at a fast pace. They should be used to increase overall adoption and ROI of purchased point solutions. These solutions increase usage of multiple point solutions, helping employees gain efficiency and provide a faster time to full performance for new hires. The largest use case is for sales onboarding to get them up to full productivity faster utilizing multiple point solutions. The second use case helps with process change management. The technology requires little technical involvement and deploys quickly. It is deployed mainly on top of cloud solutions showing little, if any, degradation in performance of the original software; although in some cases they can be deployed with legacy on-premises solutions. Analytics are evolving and use of simple bots is emerging. The larger vendors can provide quantifiable evidence that can attest to improved performance and justification for the expense of a digital adoption solution. Digital adoption solutions do not replace formal training or sales training solutions but rather reinforce formal learning.

User Advice: Application leaders should investigate these solutions where there is lack of adoption for a required application such as sales force automation (SFA) or Office 365 (O365) as a first use case within a job role. If there are multiple applications that are required for full connection of work, these should be considered as a bundled purchase to minimize pricing of the overall solution. Make sure to include employees in the design and testing of the workflows and to benchmark and track improvements to performance.
**Business Impact:** Digital adoption solutions can provide high value to an organization looking to improve adoption of existing tools. Performing tasks more quickly can enable new employees to become fully productive faster and existing employees to change rapidly as business processes change. For example, tenured sellers will be able to focus more on selling than the execution of tasks. The solution provides the best path to accomplish tasks resulting in the elimination of manual and "offline" data input and tracking.

Digital adoption solutions are relevant for any organization in any vertical where an SFA, HR, ERP or digital workplace solution is used. They are most helpful for when:

- There are multiple solutions that need to be adopted for a user to perform their job
- Tasks are complex
- Tasks are performed infrequently
- Business processes are changing frequently

For external use cases where your company sells software, consider OEMing a DAS. Its capabilities help with onboarding, user adoption and increased customer satisfaction. While the initial use case is for sales, it should be considered for other parts of the organization such as HR, ERP, procurement and digital workplace.

**Benefit Rating:** High

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Sample Vendors:** Appcues; AppLearn; Apty.io; Digital Attitude; InsideBoard; Pendo; Toonimo; Userlane; WalkMe; Whatfix

**Recommended Reading:** "Increase Sales Productivity With Digital Adoption Solutions"

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**Citizen Data Science**

**Analysis By:** Carlie Idoine; Shubhangi Vashisth; Rita Sallam

**Definition:** Citizen data science is an emerging set of capabilities and practices that allow users to extract advanced analytic insights from data without the need for extensive data science expertise.

**Position and Adoption Speed Justification:** Current modern analytics and BI approaches enable business users and application developers to do manual data preparation, data exploration and some pattern detection. However, building data science and machine learning models requires expert data scientists who are expensive to hire and in short supply. Citizen data science tools guide the user through the end-to-end modeling process by automating some manual and bias-
prone tasks like feature selection. Many augment the user’s discovery capabilities by automatically generating and prioritizing statistically meaningful insights for users. Central to citizen data science are augmented analytics capabilities including automated, streamlined data access and data engineering, augmented user insight through automated modeling and pattern detection including feature engineering, model selection and validation, automated deployment and operationalization, and a focus on collaboration and sharing.

User Advice: For data and analytics leaders:

- Look for opportunities for citizen data science to complement and collaborate with existing user-oriented modern analytics, and BI and expert data science initiatives. Define the citizen data scientist as a legitimate role within the organization. Define its “fit” relative to other analytic roles, and identify business analysts and other specialists who fit the citizen data scientist profile.

- Assess your organization’s readiness for business-user-accessible advanced analytics by evaluating your data, technology, process and skills in terms of alignment with business outcomes and skills. Implement a program for developing citizen data scientists from existing roles such as the business analyst, data analyst and application developer.

- Monitor the capabilities (technology) and roadmaps of your modern BI and data science platforms, as well as emerging startups as they mature in terms of the data preparation required, types of data that can be analyzed, the types of algorithms supported and the augmented analytic features supported.

- Educate business leaders and decision makers about the potential impact of a broader range of users leveraging and understanding data science and machine learning. At the same time, stress the need for education, user enablement, responsible use, governance and collaboration between citizen data scientists and specialists to avoid negative consequences.

- Improve highly skilled data science productivity with citizen data science by defining and providing guidance for the interactions and responsibilities of both disciplines. Recognize that you still need specialist data scientists to validate and operationalize models, findings and applications.

- Provision citizen data science tools, platforms and process to support and encourage collaboration between business users, application developers and expert data scientists.

Business Impact: Citizen data science forms the foundation of next-generation analytics. It will make insights from data science and machine learning more accessible and pervasive in the enterprise. Citizen data scientists can be leveraged to fill the data science and machine learning talent gap that is currently being experienced due to the shortage and high cost of data scientists. Citizen data science often brings extensive domain expertise that is sometimes lacking with expert
data scientists. Citizen data science also has the potential to make expert data scientists more efficient.

Incorporating citizen data scientists into specific phases of the analytic life cycle can enable more scalable and focused use of data science and machine learning resources across the organization. Leveraging citizen data scientists in the exploratory phase of a project, for example, can enable the highly skilled data scientists to focus their expertise on the more cutting-edge model building phases. Citizen data scientists can also operate as “business translators,” an often missing and much needed role for data science teams today.

Citizen data science will be a key driver of analytics adoption during this decade and the next. Gartner anticipates that, within the next several years, citizen data science will rapidly become more prevalent as an approach to enabling and scaling data science capabilities more pervasively throughout organizations. Gartner also predicts that, by 2024, a scarcity of data scientists will no longer hinder the adoption of data science and machine learning in organizations.

**Benefit Rating:** Transformational

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Sample Vendors:** Aible; Alteryx; Big Squid; dotData; DataRobot; Prevision.io; Salesforce (BeyondCore); SAS; SparkBeyond; Tellius

**Recommended Reading:**
- “Maximize the Value of Your Data Science Efforts by Empowering Citizen Data Scientists”
- “Build a Comprehensive Ecosystem for Citizen Data Science to Drive Impactful Analytics”
- “Pursue Citizen Data Science to Expand Analytics Use Cases”
- “Four Real-World Case Studies: Implement Augmented DSML to Enable Expert and Citizen Data Scientists”
- “Worlds Collide as Augmented Analytics Draws Analytics, BI and Data Science Together”

**Conversational User Interfaces**

**Analysis By:** Magnus Revang; Van Baker

**Definition:** Conversational user interface (CUI) is a high-level design model in which the user and machine interactions primarily occur in the user’s spoken or written natural language. Sophistication of the CUI can vary from understanding just simple verbal utterances to handling complex multiturn interactions.
Position and Adoption Speed Justification: CUIs can exist as a front end to application or business process, but also as a description of the interface employed by chatbots and virtual assistants. It’s being popularized through products like the Amazon Echo that uses the Amazon Alexa Virtual Personal Assistant (VPA) and Google Home that uses Google Assistant VPA. Enterprises are coming on board, with chatbots and virtual agents being the primary use case for AI technology in enterprises.

The promise of CUIs is a shift in responsibility between the user and the interface. In traditional user interfaces (UIs), the user is an operator of the technology and is largely responsible for the effects of using the technology. In a CUI, this responsibility shifts as the CUI is responsible for taking the user input and determining the intention of the user. Conceptually, the CUI has taken over some of the responsibility that was once reserved for the user. This makes CUIs the first widespread adoption of agent user interfaces.

CUIs will evolve their conversational capabilities through advances in natural language understanding (NLU) and in more advanced dialogue management. Additionally, we will see the introduction of multimodal interactions, where speech, text, video and point-and-click interactions are all part of the input used to determine the intention of the user.

User Advice: The conceptual shift away from the user as the operator toward the user as conversing with an agent that will execute on a determined intention — has greater impact on the enterprise than most realize. Training, onboarding, escalations, productivity, empowerment and responsibility all change with this new model and need to be embraced as part of CUI projects. Treat CUIs as transformative and plan on it, and by evolution AUIs becoming the dominant interaction model in the future.

Underlying technology supporting CUIs, either front ends delivered as part of software or custom developed CUIs like chatbots and virtual agents built on top of conversational platforms, still needs to evolve until they reach their potential. Vendor and technology choice is tactical for the foreseeable future. Voice will also arrive as a strong modality, but trail text in capabilities for some time.

Prepare for CUIs to communicate with each other. Larger architectures connecting different use cases for CUIs, like virtual agents for customer service, HR, IT to front ends for enterprise software, business intelligence tools, etc., will be a central challenge for organizations in the next three to five years. This will lead to a variety of architectural models like CUI-to-CUI communication and specialist tooling entering the market.

Prepare for new roles in the enterprise. Dialogue designer, AI trainer, digital coach, humanizer and AI interaction designer are all titles Gartner is seeing in the market to support the creation of conversational experiences.

Business Impact: CUIs are the interaction pattern of many chatbots and virtual assistants — both will be significant contributors to the impact of CUIs, especially in high-touch communicative fields.
of customer service and Q&A-type interactions with significant volume.

Outside of this, CUIs will appear primarily in new applications. Enterprise IT leaders should be on the lookout for (and biased toward) CUIs to improve employee (and customer) effectiveness, as well as to cut operating expenses and time spent learning arcane computer semantics.

There will also be some retrofiting. Over the next three to five years, we do not expect large enterprises to invest heavily in retrofitting existing systems of record where the employee base is experienced and stable, and the feature set is well-known to the user base. Where there is high employee turnover or rapid changes in features, or enterprises face a burden of providing computer literacy training, IT leaders need to consider creating people-literate front ends to make it easier for employees to adapt and excel.

**Benefit Rating:** Transformational

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Sample Vendors:** Amazon; Baidu; Facebook; Google; IBM; IPsoft; Microsoft; Oracle; Salesforce; SAP

**Recommended Reading:**
- “Architecture of Conversational Platforms”
- “Designing Conversational Experiences for Chatbots and Virtual Assistants”
- “Market Insight: How to Collaborate and Compete in the Emerging VPA, VCA, VEA and Chatbot Ecosystems”

**Workstream Collaboration**

**Analysis By:** Mike Gotta

**Definition:** Workstream collaboration tools create a persistent chat-based workspace that helps groups coordinate shared work activities. Tools integrate direct and group messaging, alerts, activity streams, files, tasks, bots, search, meetings (audio, video) and applications into a channels-based experience.

**Position and Adoption Speed Justification:** Workstream collaboration (WSC) tools are best used to coordinate project- or process-related teamwork. Business use cases include project management, service and support, sales, marketing, and operational scenarios. Workstream collaboration improves team communications and coordination using channels to unify interaction with applications, tasks and content. As products include AI-related services, greater levels of collaboration automation and a broader set of use cases will emerge.

**User Advice:** Evaluate workstream collaboration technology for use by groups and teams whose work activities are conversationally driven, with dynamic workflows and that are geographically dispersed. Growing adoption of WSC tools can lead to ill-suited use cases, creating change
management burdens and weakening business results. While a strong solution for remote work in response to COVID-19, organizations should provide contextual training and information on how to use WSC tools for their particular role and work activity (versus generic tech learning). Add-on apps can also help with team creation, usage, and task coordination as third-party vendors fill tool gaps. Adopters of workstream collaboration solutions report that onboarding new team members is relatively easy; however, etiquette takes time to establish and effective use can require team members to work in new ways, which can require a range of enablement services to improve adoption.

**Business Impact:** Workstream collaboration tools improve teamwork across a variety of business activities. With the rise in remote work, there has been significant acceleration to deploy these tools to create a common activity hub. WSC tools will become as vital to employees as email. As WSC tools are used more to automate work activities, the operational and logistical benefits will continue to broaden as well.

**Benefit Rating:** High

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Sample Vendors:** Cisco; Google; Mattermost; Microsoft; Slack

**Recommended Reading:**
- “Market Guide for Workstream Collaboration”
- “Adoption of Meeting and Workstream Collaboration Solutions Spikes in Response to Coronavirus (COVID-19) Pandemic”
- “A 6-Step Checklist for Effective Deployment of Microsoft Teams in the Digital Workplace”
- “Embrace Workstream Collaboration to Transform Team Coordination and Performance”

**Collaborative Work Management**

**Analysis By:** Nikos Drakos

**Definition:** Collaborative work management tools support business users in work planning and execution. They combine task, timeline, resource, workflow and project planning with conversations, content publishing, reporting, analytics, dashboards and automation.

**Position and Adoption Speed Justification:** Collaborative work management (CWM) tools focus on planning and work modeling via tasks, timelines, and workflows. But they also support conversations, notifications, dynamic reports and information sharing, to ensure that every participant has an up-to-date view both of plans and the state of execution. This is suitable for an agile and iterative approach to work execution that is accessible to teams of business users.
Vendors such as Asana, Atlassian, Hive, monday.com, Smartsheet, Workfront and Wrike provide specialist CWM products. In addition, vendors of conventional and adaptive project management and business process management products are adding more flexible, dynamic and collaborative capabilities. However, these tools for the most part target professional planners and process modelers. CWM tools often lack the sophistication that such professional users require (e.g., resource and budget management or process modeling). This trade-off, however, is the defining characteristic of CWM tools that makes them accessible to general business users.

**User Advice:** The business impact of collaborative work management can go beyond the efficiency gained from either managing or executing preplanned work. Application leaders can work with business colleagues to address one of the key problems of the modern workplace: Easing the burden of managing nonroutine work, especially when carried out by workers often working remotely and acting with a degree of autonomy.

Application leaders should anticipate and address challenges from culture, behavior and skills requirements by starting with deployments where working transparently and collaboratively are already the norm. Where transparency and collaboration do not yet happen naturally, CWM deployments should be part of a broader digital workplace program. In this way, it is possible to deal systematically with work design and change management issues.

Collaborative work management also raises new governance questions including access rights to work management capabilities in order to ensure consistency, quality and reuse. From a governance perspective, CWM should be treated as “citizen development.”

CWM tools are proliferating through discretionary spend in different departments raising questions about technology redundancy and the need to embark on application rationalization and consolidation as their use expands. At the same time, customers that enjoyed low-cost entry pricing need to keep control of their costs as vendors modify their pricing models under pressure from their own investors. Market consolidation is likely, and not all CWM vendors will survive, but rather, will be acquired by larger enterprise software vendors or will reach a plateau in business growth.

**Business Impact:** Collaborative work management technology can potentially be used by everyone. It can empower them to collaboratively carry out the planning, execution, optimization and, increasingly, automation of day-to-day work. At the same time, it provides transparency for oversight, as well as the ability to define and fix “guardrails” that represent constraints on outcomes, timelines, budgets or resources. The core value proposition of collaborative work management is to improve activity coordination in a flexible and agile manner.

The introduction and use of collaborative work management practices will be an important contributor to increasing business agility. These tools are particularly effective in supporting work and activity coordination among distributed teams and so they will have an increasingly important role to play as remote work becomes more prevalent.
Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: Asana; Atlassian; Clarizen; Hive; monday.com; Mavenlink; Microsoft; Smartsheet; Workfront; Wrike

Recommended Reading: “Collaborative Work Management in the New Work Nucleus”

“Market Guide for Collaborative Work Management”

“Toolkit: Collaborative Work Management Vendor and Product Data”

“How to Select Collaboration Technology Using Gartner's ACME Framework”

“Market Guide for Adaptive Project Management and Reporting”

“Marketing Work Management: How to Control Chaos, Streamline Workflow and Gain Efficiency”

Sliding Into the Trough

Employee Wellness

Analysis By: Sam Grinter

Definition: Employee wellness is deployed by organizations to encourage worker well-being through lifestyle change. Components of employee wellness include mobile apps, wearable devices, cloud-based services with analytics dashboard to track status, on-demand motivational and instructional content, organized events, and rewards. Application components include an app store, communities and social networking capabilities, as well as gamification services (such as leaderboards, goals progression and challenges).

Position and Adoption Speed Justification: Over the past four years, the level of customer inquiry on the subject of employee wellness has remained low, and some of the larger vendors in the market have pivoted away from pure physical wellness and toward wellness as part of a wider employee experience, and organizational culture initiatives as part of the employment value proposition. Some interest in employee wellness has been driven recently as a measure to support workers during COVID-19. It is likely that such deployments will take the form of short-term initiatives rather than lasting engagements. As such, this short-term increase in demand is unlikely to change the fortunes of the employee wellness market in the long term.

If employee wellness is to progress to mainstream adoption, then it has to be much less about hardware devices and more about the value that wellness applications can deliver via a mobile platform. Furthermore, the concept of wellness should be developed beyond physical fitness to incorporate elements of mental, social and financial well-being, thus furthering the potential impact
of wellness initiatives and decoupling wellness from the wearable devices market. Finally, a further potential avenue is for other wellness initiatives to be included as part of a broader employee experience and organizational culture initiatives as a means of bolstering the employment value proposition.

User Advice: Application leaders attempting to transform HCM should consider investing in employee wellness to support the welfare of their workers. Promoting digital dexterity, engagement and other soft skills makes employee wellness relevant to digital workplace efforts. Employee wellness can be initiated by anyone in an organization. It can start as a grassroots effort to reduce stress, to become more physically active, or to create a greater sense of team spirit. Activities can include walking meetings, individual challenges, and even team competitions. Wellness coaches, and recognition and rewards tools, can play a key role in encouraging participation and building communities. Employee wellness becomes more strategic and transformational when connected to formal wellness programs and HR processes, and when it includes the involvement of senior leadership. Furthermore, employee wellness can influence needs for workplace and workspace design. It should also be factored into bring your own device (BYOD) and bring your own app (BYOA)/consumer HR app programs.

Employee wellness can be delivered via point solutions, benefits management systems, and HCM suites. To reduce the time to deploy and to improve integration, buyers should first review the wellness capabilities offered by existing benefits and HCM providers. If the capabilities of these offerings are not suitable, wellness point solutions should be considered.

Business Impact: The traditional rationale for wellness programs has been to reduce healthcare costs borne by the employer. The evidence now suggests that wellness initiatives offer limited and indirect healthcare cost savings, and other initiatives (such as disease management programs) are more effective at reducing healthcare costs. An emerging viewpoint is that organizations need to look beyond the cost argument and examine how a consumer-driven wellness initiative can positively influence employee engagement, experience, retention, unexplained absence, absence due to illness and digital dexterity, as well as organizational, cultural and business productivity.

Business and IT leaders who encourage their workforces to come together in voluntary group activities and contribute toward something that has personal and work-related value can help to promote shared behaviors, a greater sense of community, and a culture of well-being. This reflects positively on employees and employer alike.

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: Apple; EnLyte; Even; GO Mammoth; Jiff; Limeade; Virgin Pulse; Vitality; Welltok; Whil Concepts
Recommended Reading: “Employee Wellness: A Shift From ROI to Employment Value Proposition”

“Market Insight: Build a Comprehensive Wellness Platform for Maximum Consumer Engagement”

“Market Insight: Disruptive Macro Trends for 2025 Personal Tech Market — Holistic Wellness”

Employee Recognition and Reward Systems

Analysis By: Chris Pang

Definition: Employee recognition and reward systems enable organizations to recognize employees “in the moment,” which can be event-driven, peer-to-peer and/or supervisor-to-employee. The result in a “shout out,” virtual badge, “like,” and/or points that can be redeemed for a gift. This provides a record of recognition that can be used as input to a continuous or end-of-year appraisal process. Recognition systems are increasingly associated with EXtech, but it remains a separate technology category and market.

Position and Adoption Speed Justification: Technology offerings for employee recognition have grown rapidly as vendors address the industry trend of employee engagement, culture and the enablement of continuous performance management practices. Solutions come from best-of-breed providers, human capital management (HCM) and talent suite providers, and general business application providers. Solutions with reward capabilities (e.g., gift cards and products) remain the domain of specialist vendors. However, mainstream usage of recognition and reward technology for “in the moment” recognition is still relatively low, with many organizations still using recognition platforms purely for years-of-service awards.

User Advice: As organizations move through the COVID-19 crisis, they should leverage recognition technologies to encourage and maintain cultural cohesion and employee engagement. Use a tactical approach to implement a recognition technology to meet discrete needs, such as informal feedback, years of service and life moments. Frame it as part of a strategic plan to measure and improve employee engagement and culture. Gain executive support for maximum effect and budget to properly maintain the program. Consider different types recognition within a single system, such as event-driven (e.g., internal referrals for new hires), top-down, peer-to-peer, external-to-internal and group recognition. Focus recognition comments on positive feedback. Make recognition an evolving program with potential expansion to more stakeholders and new use cases. Engage with providers who can proactively assist you with ongoing program management and best practice. Amplify the impact of recognition with a reward component. Choose systems appropriately which have local language and in-region fulfillment services (if using rewards as well) to simplify tax and delivery complexity.

Business Impact: Used correctly and broadly, recognition and reward initiatives improve employee engagement, productivity, culture, employee retention and business performance. Look for opportunities to use recognition and reward technology to bolster existing talent process. Leverage the recognition technology as additional data points for performance appraisals, use recognition during and post onboarding to amplify the “welcome” for new employees. Recognition and reward
technology can also be used for health and safety programs, training, social and corporate responsibility programs, as well as more sophisticated culture change initiatives.

**Benefit Rating:** Moderate

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Sample Vendors:** Achievers; BI WORLDWIDE; Kudos; Madison; Maritz Motivation; O.C. Tanner; Qarrot; WooBoard; Workhuman; Workstars

**Recommended Reading:**
- “How HCM Technologies Can Support Cultures That Perform in Uncertain Times”
- “How to Select a Recognition and Rewards Solution to Boost Employee Motivation and Engagement”
- “Get Ready for the Convergence of Employee Performance and Engagement”
- “Culture of Quality Reward and Recognition Program Library”
- “Use Recognition and Reward Programs to Boost HR and Talent Effectiveness”
- “Social Employee Recognition Systems Reward the Business With Results”

**Robotic Process Automation**

**Analysis By:** Robert Hetu

**Definition:** Robotic process automation (RPA) is a digital enablement technology that predominantly leverages a combination of user interface (UI) and surface-level features to create scripts that automate routine, predictable data transcription work.

**Position and Adoption Speed Justification:** RPA provides a tremendous opportunity for retailers to leverage staffing effectively by automating repetitive and mundane tasks, use cases span the entire business value chain. Now entering the Trough of Disillusionment, progressing quickly due to the critical need to reduce costs and improve efficiency as part of cost optimization driven by the current pandemic and resulting economic crisis. Labor is one of the highest costs on the traditional multichannel retailer's balance sheet, and with the competitive pressure from an industry in the midst of a seismic transformation, staff will be impacted by job loss or redeployment. Retailers must redeem savings by eliminating and revamping old, outdated processes. There is no doubt that operational jobs such as cashiering, restocking and click and fulfillment will be affected by automation.

Retail headquarters staff will also be disruptively impacted. RPA has been added to the retail Hype Cycle to call out its use as a tool to automate many Excel-based processes in the headquarters.
With large numbers of well-paid associates who are responsible for making big-dollar decisions that affect every aspect of the business, headquarters are also prime targets for reduction and elimination through automation. In one example, a global retailer used RPA to connect an internationally diverse general ledger project spanning 35 countries. The automation connected two separate systems, saving significant manual effort. Immediate and quantifiable cost savings can be attributed to elimination of operator error and improved overall stability.

Basic algorithms already play a major role in retail headquarters. However, there are several problems with the current approach, which is largely driven by extensive use of Excel and Access:

- Quality of the algorithms maintained in vast spreadsheets, rather than properly catalogued and curated, can be prone to undetected error.
- Propagation of best practices across the organization depends on individuals’ word of mouth, since algorithms are locked inside disparate spreadsheets.
- Depth and breadth of analysis are limited by issues of complexity and data management.
- Timeliness of decision making is too slow to meet today’s requirements.
- Execution is hampered by inability to perform timely updates to core systems.

This is long overdue in legacy retailers, helping efforts in digital business optimization of historically necessary processes that simply are now irrelevant.

User Advice: Retail CIOs should:

- Create a framework for use-case identification by focusing on narrow problems with high levels of non-value-adding (NVA) activity using structured digital data in stable systems.
- Investigate both back- and front-office use cases ripe for RPA. These will include automation of finance, supply chain as well as customer-facing call center processes.
- Utilize specific KPIs to ensure that this type of customer-facing automation is having no negative impact on customers’ experiences.
- Start with evaluating and eliminating heavily Excel-dependent and manual tasks that would benefit from automation, algorithms, and more complex and detailed analysis.
- Pilot a project immediately and use the lessons to develop a more comprehensive RPA implementation plan. This is a critical part of the learning experience for the organization.
- Create strong foundations for automation selection, maintenance and governance by working closely with your company’s center of excellence for automation.
- Ensure that your choice of automation supports both short- and long-term business goals by partnering with IT to build a comprehensive customer fulfillment automation roadmap.

**Business Impact:** In 2016, Gartner predicted by the end of 2020, merchant leaders will rely heavily on algorithms, prompting the top 10 retailers to cut up to 33% of headquarters merchandising staff. COVID-19 will further hasten this action in the hardest hit industry sub segments including apparel and footwear. Furthermore, through 2022, at least two large, multichannel retailers will replace 10% of store associates with nonhuman resources. Retailers will redeem labor cost savings from RPA, some of which will be transferred to customer-facing associate responsibilities and higher-level customer experience process design, as well as product and service development.

**Benefit Rating:** High

**Market Penetration:** 20% to 50% of target audience

**Maturity:** Early mainstream

**Sample Vendors:** Atos Syntel; Automation Anywhere; Blue Prism; Cognizant; Jacada; Pegasystems; Redwood; UiPath; Verint Systems; WorkFusion

**Recommended Reading:** “Magic Quadrant for Robotic Process Automation Software”

“Critical Capabilities for Robotic Process Automation”


“Preparing for the AI-Based Retail Nervous System”

“2020 Retail Digital Transformation and Innovation Trends”

**Virtual Assistants**

**Analysis By:** Van Baker

**Definition:** Virtual assistants (VAs) help users with a set of tasks previously only made possible by humans. VAs use semantic and deep learning (such as deep neural networks [DNNs], natural language processing, prediction models, recommendations and personalization) to assist people or automate tasks. VAs listen to and observe behaviors, build and maintain data models, and predict and recommend actions. VAs can be deployed in several use cases, including virtual personal assistants, virtual customer assistants and virtual employee assistants.

**Position and Adoption Speed Justification:** The most widely recognized virtual assistants are consumer-facing and predominantly use conversational interfaces. This includes Apple’s Siri, Google Assistant, Microsoft’s Cortana and Amazon’s Alexa. However, enterprise VAs such as IPsoft’s Amelia, Nuance’s Nina, Salesforce’s Einstein and Openstream’s EVA are rapidly growing in importance in business. Increasingly, VAs will be combined with event triggers and other
automation technologies to enhance the value in enterprises. These VAs will increasingly use contextual multiturn conversations to drive business workflows. Additionally, increased integration with back-end and hosted services will enhance the capabilities of VAs as they migrate toward being centered on the user rather than transactions. Cellular phones continue to be the dominant platform for VAs although business driven endpoints are increasingly being deployed. Consumer-connected endpoints such as Amazon's Alexa devices and Google's Home devices have broadened the use of VAs and voice. Tools such as Google's Dialogflow, Amazon's Lex and Polly, Microsoft's Azure Bot Service and Power Virtual Assistant, and IBM's Watson Assistant are making creation of enterprise virtual assistants more accessible. Increasing use of voice to access information and initiate business processes is becoming the focus of many conversational platform providers. We expect virtual personal assistant (VPAs) to see continued adoption by consumers/customers.

**User Advice:** App development leaders should develop a VA strategy that focuses on text capability first, but with voice following closely, because VAs will increasingly be integrated with business process automation and event-driven software architectures to allow for conversation-initiated workflows.

Deploy VAs in the business conversational user interfaces to increase importance and accessibility. Individuals may use multiple VAs, but there is a limit to the number that employees or consumers will engage with so enterprises should guard against proliferation of embedded VAs. Businesses will migrate from initial single deployments to a set of VAs that orchestrate groups of specialist chatbots, with narrowly scoped intents. This will be facilitated by increasing levels of integration with multiple data repositories, applications and business processes requiring orchestration or these resources in response to VA initiated workflows.

Coordinate the use of VAs across the use cases in the enterprise and avoid fragmented solutions based on single use case providers.

Look for opportunities to leverage VAs to make users more productive with their business apps by integrating VAs with business process automation to enable conversational triggered business processes in well-defined use cases.

Incorporate analytics to measure the impact of VAs on behavior and performance. Closely monitor the use of VAs by customers as well as your workforce assuming that ongoing model management will be required if VAs are to continue to perform at acceptable levels.

Assume that VAs will be applicable across the enterprise with multiple use cases including customer and employee engagement across multiple domains in the enterprise with increasing integration across enterprise workflows and business processes.

**Business Impact:** VAs have the potential to transform the nature of application use for the workforce and customers. Conversational initiation of business processes combined with system-initiated events will increase accessibility to business workflows.
VAs can be built using tools and hosted AI services licensed from providers or created using professional services. Performance of the VA is dependent on the quality of the dataset used to add domain-specific information, and the quality of the hosted-language-oriented AI services. Additionally, the level of integration capabilities of the provider will grow in importance.

Security and the collection of personal information must be managed intelligently and adhere to all legal and regulatory requirements as user adoption of VAs grows. Embedded VAs will be easy to use, but will complicate the use models in the enterprise, so adoption should be evaluated on a case-by-case basis.

As they mature, VAs will rapidly shift in focus from being transaction-centric to user-centric whether for employees or customers. VAs will increasingly incorporate user profiles that collect and use contextual data that must be managed to enhance the user experience without violating user privacy concerns.

**Benefit Rating:** Transformational

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Sample Vendors:** Amazon; Google; IPsoft; Microsoft; Nuance; Openstream; Oracle; Salesforce; SAP; [24]7.ai

**Recommended Reading:**
- “Market Guide for Virtual Customer Assistants”
- “Designing Conversational Experiences for Chatbots and Virtual Assistants”
- “Market Guide for Conversational Platforms”
- “Magic Quadrant for Cloud AI Developer Services”
- “Use Master Chatbots to Improve Conversational Experiences”
- “Governance and Best Practices for Chatbot Development”

**Chatbots**

**Analysis By:** Magnus Revang

**Definition:** A chatbot is a domain-specific conversational interface that uses an app, messaging platform, social network or chat solution for its conversations. Chatbots range in sophistication from simple, decision-tree-based, to implementations built on feature-rich platforms. They are always narrow in scope. A chatbot can be text- or voice-based, or a combination of both.

**Position and Adoption Speed Justification:** Chatbots represent the No. 1 use of artificial intelligence (AI) in enterprises. Primary use cases are in customer service, human resources, IT help
desk, self-service, scheduling, enterprise software front ends, employee productivity and advisory. There are also a variety of offerings in the market, such as developer self-service platforms, managed products, middleware offerings, integrated offerings and best-of-breed approaches.

Chatbots in social media, service desk, HR or commerce, as enterprise software front ends and for self-service, are all growing rapidly. Still, the vast majority of chatbots are simple, relying on scripted responses in a decision tree and relatively few intents. Similar to chatbots are virtual agents, which are broader in scope and sophistication, require more infrastructure and staffing to maintain, and are designed for an extended relationship with their users outside of single interactions. Users will interact with hundreds of chatbots, but few virtual agents.

The majority of implemented chatbots are unsophisticated and rule-based — failing to live up to expectations of stakeholders. The number of proofs of concept (POCs) is high, as is the failure rate to bring even unsophisticated chatbots into production. Gartner is seeing a backlash against chatbots, primarily focused on unsophisticated implementations.

**User Advice:**

- Start POCs for chatbots today, because most enterprises experience trouble scaling from the initial POC to production. The focus should be on uncovering the hindrances that will stand in your way.
- Treat vendors as tactical, not strategic — acknowledge that you’ll most likely want to switch vendors in the future.
- Focus on vendors offering platforms that can support multiple chatbots.

**Business Impact:** Chatbots are the face of artificial intelligence and will impact all areas where there is communication between humans today. Customer service is a huge area where chatbots are already influential. Indeed, this will have a great impact on the number of service agents employed by an enterprise and how customer service itself is conducted. For chatbots as application interfaces, the change from “the user learns the interface” to “the chatbot is learning what the user wants” has significant implications for onboarding, training, productivity and efficiency inside the workplace. To summarize, chatbots will have a transformational impact on how we interact with technology.

Chatbots have played a strategic role in several companies’ response to COVID-19. This might have an acceleration effect on the technology.

**Benefit Rating:** Transformational

**Market Penetration:** 20% to 50% of target audience

**Maturity:** Adolescent
Sample Vendors: Amazon; Cognigy; Google; IBM; Microsoft; NTT DOCOMO; Oracle; Rasa; Rulai

Recommended Reading: “Architecture of Conversational Platforms”

“Market Guide for Conversational Platforms”

“Market Guide for Virtual Customer Assistants”

Desktop as a Service

Analysis By: Nathan Hill; Michael Silver

Definition: Desktop as a service (DaaS) is a service offering that provides users with an on-demand, virtualized desktop experience delivered from a remotely hosted location. It includes provisioning, patching and maintenance of the management plane and resources to host workloads.

Position and Adoption Speed Justification: Organizations have long been interested in adopting virtual desktop infrastructure (VDI), but complexity and capital investment have made VDI implementations difficult. Relying on a service provider to take on the risk of platform build-out and to provide high-volume computing services is an attractive alternative for organizations that want to deliver applications on a device-neutral basis.

DaaS vendors originate from a software, cloud or hosting backgrounds. Some own the complete platform (such as Amazon WorkSpaces and Microsoft Windows Virtual Desktop), while others leverage hyperscale platforms, especially from Amazon and Microsoft, to bring a service-brokered offering to market.

The adoption of cloud office and SaaS increases the viability of a DaaS solution as an organization's data and services become increasingly externalized, especially when supporting highly geographically dispersed workers. This, coupled with the entry of Microsoft into the market, has injected a significant amount of hype back into DaaS. Microsoft isn't the only DaaS choice, but it heavily influences digital workplace I&O leaders’ thinking, due to Microsoft’s control points in the ecosystem. DaaS is moving toward the Trough of Disillusionment partly because of greater understanding of its long-term cost implications, but also as knowledge of all strengths and weaknesses become more widely understood.

COVID-19 has highlighted the value and business continuity strength of DaaS in its ability to rapidly enable remote work where on-premises options have stalled due to issues with data center access and infrastructure supply chains. COVID-19 is likely to accelerate adoption of DaaS, and may perpetuate as a delivery architecture even when employees return to the office.

User Advice: Enterprises should consider DaaS for use cases related to transient access requirements, business continuity needs or accelerating business goals. The typically high total cost of ownership (TCO) makes it hard to justify DaaS, but COVID-19 has highlighted it as a very strong solution for remote working and work-from-home scenarios. Organizations should not
hesitate to conduct a proof of concept (POC) to gain a better understanding of how this service can benefit their organization.

Use DaaS for:

- Short-term employees, such as seasonal workers, where user volumes spike, or for workspace provisioning to third parties and contractors. The per-user/per-month common billing approach makes this ideal to avoid asset-loss risk and to reduce the provisioning lead time associated with notebooks.

- Merger and acquisition (M&A). As with short-term employees, VDI can help with M&As, but the lead time for infrastructure procurement and underutilized capacity may make DaaS a better fit to accelerate the M&A process, even if only temporarily.

- Remote workers. DaaS can extend the workspace to remote users, especially with hyperscale solutions that have deep global penetration, and may be preferable to expanding an existing data center or colocation footprint.

- Business continuity. DaaS can be used as a workspace recovery solution and has proven a successful solution during COVID-19, enabling organizations to securely extend work from home.

Graphics-enabled DaaS extends the service to designer use cases. However, the cost differential compared with on-premises VDI and the performance sensitivity can be even greater here. Organizations must test functionality and performance thoroughly. Look to combine DaaS with other services provided from the same cloud provider to improve network connectivity to the cloud (such as SLA-backed, dedicated links) to optimize performance.

For smaller organizations that are aggressively migrating to cloud services and have fewer legacy integration challenges, the adoption of DaaS as a complete workforce solution is likely to be more viable. Typically, these organizations do not want to invest capital expenditure (capex) in data center infrastructures and operating expenditure (opex) in associated administration staff, if this distracts them from their core business goals.

**Business Impact:** DaaS has suffered from the challenges associated with the technologies that power it, namely server-based computing (SBC) and VDI. Cost, complexity and connectivity have all been inhibitors. However, with more organizations looking to deliver user-centric services across different devices and locations with an ever-increasing consumption of cloud services (SaaS, storage and productivity tools), DaaS is considered a strategic solution. The benefits of the “pay-per-use” utility of the DaaS opex model have gained mind share, as has the entry of Microsoft into the market. However, the service needs to be able to deliver a complete workspace solution for it to be viable as a primary business platform. Growth in adoption through the COVID-19 pandemic is helping to accelerate maturity in the service, but hype still remains.
Many DaaS vendors are expanding their service portfolio beyond simple OS hosting to deliver a complete workspace management life cycle solution. However, organizations that are totally reliant on browser-agnostic web applications will question the need for a Windows OS-based workspace intermediary.

**Benefit Rating:** High

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Early mainstream

**Sample Vendors:** Amazon; Citrix; Diso; Dizzion; Evolve IP; Microsoft; Nutanix; Tehama; VMware; Workspot

**Recommended Reading:**
- “Market Guide for Desktop as a Service”
- “Forecast Analysis: Desktop as a Service, Worldwide”
- “Microsoft’s WVD Will Accelerate Virtual Desktop Maturity but May Not Lower Total Cost of Ownership Enough”
- “Physical, Virtual and Cloud Desktops: Is a Hybrid Approach Inevitable?”
- “How to Keep End Users Connected to the Digital Workplace During Disruptions”

**Intranet as a Service**

**Analysis By:** Gene Phifer

**Definition:** An intranet as a service is an easily deployable SaaS package that provides out-of-the-box functionality and interfaces that deliver web-based intranet solutions. As the primary subset of the intranet packaged solutions market, intranet-as-a-service vendors facilitate configuration, customization and management to align with customers’ digital workplace initiatives.

**Position and Adoption Speed Justification:** The COVID-19-driven need for work from home has accelerated adoption of intranet as a service over the last few months. New players are still entering a crowded market, and many vendors are adding crisis communications, rapid deployment options, and pricing actions to simultaneously address current needs but also to cement themselves as a necessary vendor for the post-COVID era.

Intranet as a service vendors are segmented along multiple boundaries: (1) aligned with cloud office vendors like Google and Microsoft, (2) aligned with other platform vendors like Salesforce, Atlassian and Drupal, or (3) independent from any platform. Most intranet as a service products integrate with third party content and collaboration tools, and most of them integrate with a cloud office.
Intranet as a service vendors continue to add new features, including streaming media, mobile app development and artificial intelligence capabilities like enhanced personalization.

User Advice: Ongoing frustration with traditional intranets continues to drive business leaders to seek alternatives. Your employees hate your traditional intranet, and they are looking for rapid time to value in any new solution. Application leaders should fix their broken intranets with a high-value, rapidly deployable solution, and intranets as a service fit the bill.

intranets as a service also provide ease of access for work from home employees, but will work well in the post-COVID world where many will remain at home, while some return to an office setting. They work well for traditional office workers, but also for field workers, where mobile access is a key requirement.

Intranet as a service works best for enterprises that desire an out-of-the-box solution, but are looking for a core component of their digital workplace platform. Selection of a vendor that is agile, flexible and pluggable, is critical. Offerings with wide integration and interoperability — not just with homogeneous cloud office suites — will be the most capable of supporting differentiated digital workplace experiences. In fact, some intranet-as-a-service vendors are striving to evolve their solutions toward a broader digital workplace platform.

Start all intranet initiatives by focusing on both employee productivity and employee experience. Beware of providers that position intranet-as-a-service offerings as a complete “digital workplace.” The digital workplace is a business strategy, of which an intranet is only a part. See if other, more purpose-built applications such as employee communications applications (ECAs) or workstream collaboration (WSC) may be more appropriate for the problem at hand.

Business Impact: Intranet-as-a-service products accelerate intranet initiatives with “ready to go” intranets built using standard components, such as templates, designs and prebuilt applications. One key set of capabilities support end-user publishing and website creation. Other features include corporate communications, employee directories and community calendars.

Once deployed, the pace of intranet development can be driven by the business and its use of the service, rather than by IT and custom development of an underlying intranet platform. Subject to the constraints of the service chosen and the trade-offs arising, this focuses attention on the intranet and its use cases, rather than on the platform enabling it.

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Early mainstream

Sample Vendors: Akumina; Axero; Beezy; BONZAI Intranet; Igloo; Interact; Jostle; LumApps; Powell Software; Unily
**Recommended Reading:** “Traditional Intranets Are Dead — Modern Intranets Are Alive and Well: Part 1”

“Traditional Intranets Are Dead — Modern Intranets Are Alive and Well, Part 2”

**Citizen Integrator Tools**

**Analysis By:** Massimo Pezzini; Tim Faith

**Definition:** Citizen integrator tools are typically cloud-hosted services meant to enable expert business users with minimal IT skills to handle relatively simple application, data and process integration tasks (or “automations”) by themselves through very intuitive, no-code development environments. In addition, citizen integrator tools also provide a rich set of prepackaged integration flows (“recipes”) that business users can rapidly configure and run with no assistance from integration specialists.

**Position and Adoption Speed Justification:** Tools that support citizen integrators come in many forms:

- **Recipes** — These are prepackaged and configurable sets of integration flows, available stand-alone (at times for free), as embedded capabilities in SaaS or as add-ons to integration platforms.

- **Integration software as a service (iSaaS)** — Cloud services that enable users to implement brand new recipes and to deploy, run and customize existing ones. Typically sold to business users, they partially overlap with iPaaS and at times with digital workplace tools.

- **Integration platform as a service (iPaaS)** — These are targeted to professional integrators, but a growing number of iPaaS provide an iSaaS-like development environment on top of their offering and/or make available collections of configurable recipes atop their platform.

Pure-play iSaaS providers have achieved notable traction in the consumer and SMB markets, but not in other segments. Instead, recipes (often embedded in SaaS applications like ERP, CRM, HCM) and iPaaS providing citizen-integrator-oriented capabilities are becoming popular in midsize, large and global organizations. These are under pressure to reduce costs and increase business agility, therefore they strive for integration approaches that lead to fast time to value and don’t demand expensive and hard to find skills. The growing use of AI, ML, NLP and chatbots in iPaaS offerings will further contribute to augmenting their appeal for citizen integrators.

However, excessive expectations for ultra-easy, super-fast integration and the simplistic nature of some citizen integrator tools may still lead to disappointment, thus hindering the widespread adoption of these offerings.

**User Advice:** Business users are increasingly technology savvy and often driven by velocity and time-to-market pressures, especially in the post-COVID-19 era, which requires fast reaction to
sudden changes in the business environment. This will increasingly urge them to adopt cloud citizen integrator tools, rather than wait for their IT colleagues to methodically perform integration work. This will inevitably lead to security, compliance, management and governance issues, which central IT will eventually have to resolve.

Therefore, as application leaders responsible for integration architecture and platforms you should:

- Engage with your business users to understand their automation challenges and identify to what extent citizen integrator tools can improve their responsiveness and productivity.

- Adopt an approved, certified and supported set of citizen integrator tools and make them available to internal users in a self-service way. This will help to prevent the uncontrolled proliferation of similar tools and maintain a degree of centralized governance and monitoring. However, beware of the unsophisticated and lowest-common-denominator nature of several tools (especially, recipes) available in the market.

- When selecting an iPaaS, give preference to providers that can support both “professional” and citizen integrator requirements.

- Frame citizen integrator tools, including those embedded in SaaS applications, in your hybrid integration platform (HIP) strategies.

**Business Impact:** The insatiable need for integration as well as the mounting pressure for business change and greater efficiency caused by the post-COVID-19 global recession will fuel adoption of citizen integrator tools.

These tools enable business users to automate tasks that are currently integrated via slow and error-prone manual methods. When framed in an HIP, they can improve organizations’ efficiency, productivity, agility and innovation, while keeping technical debt, security and compliance risks under control.

Citizen integrator tools can also be leveraged as high-productivity environments for integration specialists or less-skilled IT staff (ad hoc integrators), to quickly and cheaply sort out simple tasks instead of using more sophisticated, but expensive and time-consuming tools. This can increase productivity, reduce cost of integration and free up integration specialists’ time to focus on the more challenging requirements.

Consequently, citizen integrator capabilities may help reduce integration and business operations costs and enable tactical or strategic digital initiatives by supporting fast, pervasive integration by a wide range of employees within (and potentially also outside) the organization.

**Benefit Rating:** Moderate

**Market Penetration:** 5% to 20% of target audience
Maturity: Adolescent

Sample Vendors: Adeptia; APIANT; Formstack; IFTTT; OneSaas; Oracle; Quick Base; Tray.io; Workato; Zapier

Recommended Reading: “The Applications of the Future Will Be Founded on Democratized, Self-Service Integration”

“Boost Development Team Capacity at MSEs Using Citizen Developers and Integrators”

“Market Guide for Application Integration Platforms”

Meeting Solutions

Analysis By: Adam Preset

Definition: Meeting solutions are real-time collaboration tools that support interactions over a network between participants engaged in teamwork, presentations, training and webinars. Enterprise offerings perform equally well for desk-based workers (in an office or at home), mobile workers and workers in meeting spaces, thanks to integrated voice, video, messaging and content-sharing capabilities. Some vendors have individual products for one or more use case. Others offer broad solutions suitable for multiple use cases.

Position and Adoption Speed Justification: The meeting solution market emerged from two formerly distinct markets — web conferencing and group video systems — as a response to buyers’ preferences for converged solutions. Meeting solutions have core features for video, audio and content sharing. We see innovation in relation to:

- An emphasis on meetings as the center of a platform experience, which is giving rise to integrations with other collaboration tools.
- The use of automation and new intelligence to improve meeting processes before, during and after meetings.
- Vertical specialization for roles and activities not well-served by generic horizontal products.

IT departments generally prefer a “one size fits all” approach to strategic meeting platforms, but few vendors have strong offerings for all scenarios. Some vendors are focusing on certain processes (such as sales acceleration and insurance claims) or industries (such as telemedicine and financial services) to fill current gaps. Cloud office vendors, however, have the potential to dominate by integrating content creation products and artificial intelligence (AI) with their meeting solutions, which could have a dramatic impact on almost all enterprise meetings within five years.

User Advice: Digital workplace application leaders looking for meeting solutions should:
Prioritize the enabling of remote working and support for multiple device types, including personal endpoints.

Improve meeting experiences by first looking at innovations in the meeting products they have already deployed. If they have deployed a cloud office or unified communications suite that includes a meeting solution, they should use it to the full.

Select technologies that offer consistent experiences on mobile devices, on desktops and in meeting spaces.

Deploy alternative meeting solutions or supplementary third-party services as part of a managed portfolio, if meetings must be tailored to specific needs, roles or processes.

Experiment with workstream collaboration technology, meeting-related virtual personal assistants, natural language processing, meeting transcription and other enhancements, and evaluate whether these add business value to meetings.

**Business Impact**: Meeting solutions offer a richer and more flexible experience than more limited alternatives such as audio conference bridges and video rooms. A properly specified meeting solution for workers’ activities and needs can:

- Enable real-time collaboration to support remote work.
- Increase the engagement and visibility of remote workers.
- Reduce the risks of business travel.
- Support remote training at scale.
- Obviate the need for separate audioconferencing expenses.
- Provide an upgrade path from legacy video conferencing solutions.
- Enable faster decision making during internal collaboration.
- Accelerate sales by eliminating the need for in-person visits.
- Foster higher levels of trust in customer experiences.
- Reach a wider pool of job candidates and speed up the interview process.
- Replace more expensive webcasting technologies for large-scale virtual events.
- Save time and money.
As consumer video chat and online meetings at work become norms, enterprises are recognizing how essential meetings are. They are therefore demanding more capabilities from vendors’ meeting solutions.

**Benefit Rating:** High

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Sample Vendors:** Adobe; BlueJeans; Cisco; Google; Lifesize; LogMeIn; Microsoft; Zoom

**Recommended Reading:**
- “Improve Remote Work Effectiveness by Rising to These Top 10 Meeting Challenges”
- “Magic Quadrant for Meeting Solutions”
- “Critical Capabilities for Meeting Solutions”
- “Adoption of Meeting and Workstream Collaboration Solutions Spikes in Response to Coronavirus (COVID-19) Pandemic”
- “Choose a Meeting Solution That Performs Well on Virtual Desktop Infrastructure”

**Climbing the Slope**

**Insight Engines**

**Analysis By:** Stephen Emmott

**Definition:** Insight engines apply relevancy methods to discover, organize, describe and analyze data. This enables existing or synthesized information to be delivered interactively or proactively in the context of digital workers, customers or constituents at timely business moments.

**Position and Adoption Speed Justification:** The hype behind insight engines stems from the use of AI to reinvent enterprise search, enabling enterprises to shift from keyword- to entity-centric discovery and unlock patterns inside unstructured and structured data, sourced both internally and externally. This shift enables insight — accurate and deep understanding — needed for purposeful action by placing data in context to inform. Data must be extracted from myriad sources, enriched and indexed; user queries must be analyzed and interpreted; and the touchpoint used must align with the task at hand. This comes packaged at a foundational level but must be developed by vendors, partners, and/or clients at the domain and situational levels where vendors do not offer prebuilt applications tailored to select domains and situations, e.g., CRM. Vendors have extended their use of AI (especially machine learning and knowledge graphs), new products are entering the market, and both Google G Suite and Microsoft Office 365 now include insight engines in their cloud office. Yet, the majority of enterprises have yet to shift from enabling search to delivering insight, and application of insight engines to the many and varied use cases they have the
potential to serve. As such, insight engines have moved through the Trough of Disillusionment and ascend the Slope of Enlightenment.

**User Advice:** Focus the purpose of insight engines on informing employees to deliver insight rather than searching for information. At the highest level of maturity, insight engines retrieve and synthesize facts, deliver these through other tools, and do so proactively. For instance, a chat with a bot through Microsoft Teams or Slack can be powered by an insight engine that delivers answers as snippets from documents. More typical is a traditional search page with enhancements to guide the user using (1) autosuggest or autocomplete, (2) structured results with relevant facets to allow refinement, and (3) recommendations. Moving from the latter toward the former requires clarity of purpose and discrete application of the underlying insight engine. The beneficiaries of insight — people — must be placed at the center of the initiative: personify them, identify their use cases, the applications they use to conduct work, and the sources of content and data they need to draw information from. Then, relate these back to specific business outcomes and their measures.

With most enterprises using or contemplating cloud office, many application leaders will find their cloud office includes an insight engine — Microsoft Search (in the case of Office 365) or Google Cloud Search (in the case of G Suite). These products are deeply embedded and demonstrate what is possible with a focus on collaboration and sharing. Breadth and depth of capabilities can be obtained by looking at other insight engine vendors, with customer use cases and case studies exemplifying what is possible. See “Magic Quadrant for Insight Engines” for more information.

Enterprises have one or more cloud offices, multiple search engines operating, and search and insight capabilities within CRM, ITSM, and other categories of their application portfolio. An essential step therefore is reviewing how these various search and insight engines perform and interrelate. Deciding the right portfolio of insight engines, configuring these, and enabling users to profit from them is key to ensuring insight can be facilitated across the foundational, domain and situational levels of the enterprise.

**Business Impact:** The principal impact of insight engines is on an organization's digital workplace and its capability to elevate the digital dexterity of its employees. They impact all functional domains across all industries, but are most impactful when utilized as a platform upon which to develop applications aligned with specific domains and situations. For example, proactively informing customer support agents in the context of a CRM. Such localization improves digital dexterity by enabling employees to better orient themselves to decide/act, acquire knowledge and collaborate.

A lesser-known but significant impact of insight engines is in terms of supporting automation. Insight engines can be integrated with other software such as RPA, to support the automation of various workflows relating to content, e.g., claims processing in insurance. Insight engines also have a role to play in support of digital experiences provided to external constituents, such as customer and suppliers, in the form of self-help knowledge bases, decision support, retrieval of content assets, etc.
Given these impacts, the semantic models and knowledge representation underlying insight engines and other applications will increasingly be a foundation for enterprises’ natural language ambitions.

**Benefit Rating:** High

**Market Penetration:** 20% to 50% of target audience

**Maturity:** Early mainstream

**Sample Vendors:** Coveo; Funnelback; Google; IBM; IntraFind; Lucidworks; Micro Focus; Microsoft; Mindbreeze; Sinequa

**Recommended Reading:** "Magic Quadrant for Insight Engines"

"Critical Capabilities for Insight Engines"

**Team Collaboration Devices**

**Analysis By:** Stephen Kleynhans

**Definition:** Team collaboration devices combine a computer and, usually, videoconferencing and/or audioconferencing hardware with a digital whiteboard and custom software to create a turnkey solution for meetings. As self-contained devices, these are relatively expensive; however, they can provide customized interfaces and simple operation. They typically are shared devices, without a specific assigned user.

**Position and Adoption Speed Justification:** Digital workplace initiatives are driving an interest in new options for conference room and meeting technology solutions. Team collaboration systems include software to manage meetings (start, stop, share and archive), enable projection from both the device itself or from participant devices, and include all of the functionality of interactive whiteboards. Features include the ability to walk up and start using the device immediately with limited or no sign-in process. The process may be aided by proximity and presence detection.

Prices in this space run from $5,000 to $10,000 for entry-level systems to more than $25,000 for large, full-featured solutions. Smaller units are well-positioned for huddle spaces, offices and ad hoc meetings, with larger units servicing full-size meeting rooms. Both help enable small-to-midsize groups to have more effective meetings, with some participation from remote participants. The downside is that they are often best integrated with a specific vendor’s communication and collaboration ecosystem.

The three most recognized products in this space are the Microsoft Surface Hub, Cisco Webex Board and Google Jamboard. Successful devices in this category provide:

- Easy walk-up usage with minimal effort on the part of users
- High-precision pen inputs with low latency, to make drawing feel natural
Team collaboration devices provide a natural use model with no setup required to start drawing on the device. However, some basic user training may be required to fully unlock some of its more-complex features around multitasking or conferencing.

User Advice: Even though these devices are simpler to use than cobbled together solutions, they often still are not used optimally as users are often poorly trained or unable to understand their value. Ensure user education and localized expert champions are developed to ensure a return on the investment.

To some extent these device compete with but also complement turnkey meeting room systems from various suppliers (Microsoft Teams Room, Zoom Room Systems) although the lines are blurring to enable these separate solutions to work together more smoothly.

Analyze collaboration requirements across different user groups and physical workspaces. Select vendors based on integration with existing productivity software, and on the ability to support your organization’s different geographical locations. Some vendors require an ongoing cloud subscription that should be calculated as part of the overall platform investment.

Expect the life span of these systems to be no more than five years.

Business Impact: As the nature of work becomes increasingly collaborative, organizations will invest more to equip shared workspaces to encourage physical and virtual collaboration. In some instances, organizations may require complex and expensive room systems with multiple screens and telepresence. In other cases, many smaller, shared spaces used for team collaboration will be fitted with less-expensive devices.

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: Cisco; Google; Microsoft; Prysm; Ricoh; Sharp

Recommended Reading: “Select the Right Technology for Modern Meeting Rooms”
"Create a Catalog of Activity-Based Spaces in the Digital Workplace to Improve the Employee Experience"

Citizen Developers

Analysis By: Jason Wong

Definition: A citizen developer is an employee who creates new business apps mainly for internal consumption, normally by teams or workgroups, using development tools and runtime environments sanctioned (or at least not actively forbidden) by corporate IT or the business units.

Position and Adoption Speed Justification: Citizen development is part of the business-led IT shift and the democratization of technologies trend. Business leaders are increasingly looking outside the IT organization for applications, as well as building an increasing number of applications themselves. A trend in the digital workplace is promoting digital dexterity in the workforce, which includes fostering citizen development. The COVID-19 pandemic has compounded the need for greater business agility and putting better tools in the hands of employees so they can more rapidly solve their problems with new apps and automation for enhanced productivity and decision making. According to a 2019 Gartner survey on citizen development, 41% of respondents have active citizen development initiatives and 20% of those that don’t are either evaluating or plan to start citizen development initiatives. We expect this adoption trend to accelerate further due to the changes brought on by COVID-19, which promote the idea of a digital workplace.

Citizen developers are empowered by the availability and power of low-code development tools, and “no code” tools that specifically market to the nonprofessional developer. Many smaller vendors and some large ones (such as Microsoft and Salesforce) now provide powerful low-code application platforms that make it easier for end users to develop their own applications — even applications that once required professional development skills, such as building mobile apps and using AI services. Typically cloud-based and offered as SaaS, many of these tools require only a web browser to login and build, deploy and run an app. Over time, some citizen developers will become part of fusion teams that include business and IT collaboration and development.

User Advice: Application leaders must engage potential citizen developers more actively to enlist and enable them to become “good citizen developers.” Ignoring or attempting to prevent citizen development often carries more risks and limits enterprise innovation. Specifically, application leaders should:

- Mitigate shadow IT risks by working with business unit leaders to enlist citizen developers to establish trust and define safe activity zones.
- Enable self-governing citizen development practices by fostering a community of practice (CoP) across business units and with IT.
- Improve outcomes for citizen-developed apps by joint (business and IT) selection of the right tools and enabling technologies.
Business Impact: The long-term strategic impact of citizen development is enabling self-service business innovation through employees in business units, aided by IT. Citizen development hackathons are a great way to promote and foster citizen development, while enhancing digital dexterity across the enterprise. Citizen developers have the potential to generate new ideas that can lead to greater business agility, as well as increased workforce productivity and efficiency.

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Sample Vendors: Google; monday.com; Mendix; Microsoft; Oracle; OutSystems; ProntoForms; Quick Base; Salesforce; ServiceNow

Recommended Reading: “The Future of Apps Must Include Citizen Development”

“Platform-Enabled Citizen Development (BP)”

“Maximize Digital Dexterity by Cultivating Citizen IT”

Entering the Plateau

Enterprise Social Networking Applications

Analysis By: Nikos Drakos

Definition: Enterprise social networking applications facilitate, capture and organize open and diverse conversations and information sharing and publishing between large groups or networks within an organization. In addition to capabilities that support conversations and information sharing, they can keep track of the network of relationships between participants in order to deliver a personalized stream of updates about events or conversations via news feeds and activity streams.

Position and Adoption Speed Justification: The popularity of consumer social networking platforms has spurred the use of similar social technology within businesses. Enterprise social networking applications, such as Workplace from Facebook, provide broader employee communications functionality with a core around large groups and diverse conversations, but also including video streaming and chat, as well as a bot framework. Others are part of general-purpose suites (such as Microsoft’s Office 365 and Google’s G Suite).

Increasingly, products in related markets offer “good enough” social networking functionality but with additional capabilities and support for other important business activities. These include content collaboration platforms (for example, Box and Dropbox), collaborative work management (such as Asana, Smartsheet, Trello or Wrike), workstream collaboration (such as Slack, Microsoft Teams and Cisco Webex), as well as intranet and employee communications products. This is
perhaps the reason that interest in “pure” enterprise social networking applications has remained static and is expected to decline over time.

**User Advice:** Many organizations don’t pay enough attention to what needs to be done beyond technology deployment to achieve the expected business results. IT leaders should deploy social networking applications that target specific use cases. Many enterprise social networking application deployments have failed, been ignored or slowly withered, because they lacked a clearly defined and appropriate purpose to make them relevant to the work activities of targeted participants. One particular use case with renewed interest is community and employee crowdsourcing, given the rise in remote work in order to address isolation, well-being and peer support as well as to connect frontline workers.

Governance and oversight should be addressed without compromising the flexibility and transparency required to make social networking applications attractive and engaging. There is a broad range of use cases and activities supported by these applications (such as employee communications, knowledge capture and diffusion, innovation acceleration, strategic alignment, customer support and employee engagement). An increasingly important use case is employee communications and community-building efforts, to reassure and connect the workforce during turbulent times, especially when there are high degrees of anxiety over well-being and employment. Deployments should be aligned with the requirements and nuances of each targeted use case.

Technology choices should be based on “fitness for purpose” against each use case, but without unjustified tool proliferation, bearing in mind that “good enough” social networking capabilities are increasingly available from a variety of products. Business benefits come from improved communications, the ability to influence behavior and discover people, and the opportunity to gain insights into specific activities around which social interaction occurs. Valuable information is created, shared and refined through self-selection, social incentives and decentralized control, rather than by top-down resource allocation and coercion.

**Business Impact:** Enterprise social networking applications add persistence and opportunities for discovery and reuse to otherwise transient, informal interactions. Social networking applications become relevant by connecting individuals to communities of interest and practice. They improve interpersonal communication and information sharing, making conversations and activities visible, and stimulating collaboration that involves communication, exploration, innovation, creativity, discovery, knowledge capture and training. The rise in remote work as a response to the COVID-19 pandemic is already generating more interest and demand for richer employee communication channels such as those provided by enterprise social networking applications.

Evidence of successful social networking application deployments is present, but not ubiquitous. Risks of organizational culture clashes and privacy issues, and questions about workers’ productivity and content quality, highlight the need for caution.

**Benefit Rating:** High
Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Sample Vendors: Aurea (Jive); Facebook; Microsoft; Salesforce; SAP

Recommended Reading: “A Strategic Framework for Communicating With Frontline Workers in Times of Anxiety”

“How to Select Collaboration Technology Using Gartner’s ACME Framework”

“How Technical Professionals Can Make an Impact With Team Collaboration”

“Seven Ways to Make Workplace by Facebook Successful in the Digital Workplace”

“Market Guide for Employee Communications Applications”

“Market Guide for Workstream Collaboration”

“Eight Steps for Modernizing Employee Communications in the Digital Workplace”

Cloud Office

Analysis By: Gavin Tay

Definition: Cloud office, also known as the “new work nucleus,” refers to a collection of the most broadly used SaaS-based personal productivity, horizontal collaboration and communication tools, combined into one product. It generally includes email, IM, file sharing, conferencing, document management and editing, search and discovery, and collaboration. Microsoft’s Office 365 and Google’s G Suite are the primary examples. The term “cloud office” is a general term. “Microsoft Office” refers to a specific set of products.

Position and Adoption Speed Justification: Cloud office continues to advance quickly along the Hype Cycle as enterprise adoption grows and the technologies become well-understood. In 2020, cloud office has reached the Plateau of Productivity as it becomes an accepted cornerstone of most organizations’ collaboration and communications infrastructure.

Enterprise adoption has increased on account of a general preference for cloud deployments and the desire to reduce costs, redeploy IT staff, drive simplicity and provide more functionality to users. Vendors are also offering their most attractive new features — such as mobile apps, content discovery tools and artificial intelligence available through cloud deployments only.

User Advice: Application leaders responsible for digital workplace initiatives should:

- Look beyond a “like for like” deployment that focuses only on recreating previous on-premises functionality through the cloud. Although this can be a good initial step, investigate the unique capabilities of cloud office suites to improve digital dexterity, efficiency and innovation.
Not assume that the chosen cloud office product will meet all collaboration and communication requirements. Look beyond cloud office to meet specific needs or user requirements.

Monitor the cloud office vendor’s roadmap and product announcements closely. The cloud model assumes almost continuous enhancement with new features and improvements coming regularly. Assess these additions for their impact on your operations and how to take advantage of them.

Plan specific efforts to address user adoption by focusing on user change management. It is usually not obvious how to use the new capabilities to increase effectiveness. Users will benefit from assistance and guidance, perhaps from more advanced colleagues, as a part of the digital dexterity initiative.

Look to cloud office suites as a source for continuous innovation in a form that is relatively easy to adopt. Innovations like every day AI, cross-tool integration, and better meetings are likely to come from cloud office products.

**Business Impact:** Cloud office solutions are so widely adopted that they are becoming the basis on which other vendors innovate, through add-ons and integrations. Cloud office is an important part of the emerging new work nucleus. These products support a wide variety of styles of collaboration including video, conversational, and social as well as the more conventional email and IM. Most organizations have made the move, developed a plan, or specifically decided to put off making a move that will be difficult to avoid in the longer term. Organizations that were adept at using cloud office prior to COVID-19 have had a much easier time pivoting to mandatory remote work.

**Benefit Rating:** High

**Market Penetration:** More than 50% of target audience

**Maturity:** Mature mainstream

**Sample Vendors:** Google; Microsoft; Zoho

**Recommended Reading:**

“Market Guide for Cloud Office Migration Tools”

“Create a Culture of Digital Dexterity With the ‘New Work Nucleus’”

“Enable More Productive Meetings With Google G Suite or Microsoft Office 365”

“Maximize the Effectiveness of Office 365 and G Suite With Everyday AI”

“How to Organize IT to Support Office 365, G Suite and Other Digital Workplace Applications”

**Appendixes**
**Hype Cycle for the Digital Workplace, 2019**

**Phase** | **Definition**
--- | ---
**Innovation Trigger** | A breakthrough, public demonstration, product launch or other event generates significant press and industry interest.  

**Peak of Inflated Expectations** | During this phase of overenthusiasm and unrealistic projections, a flurry of well-publicized activity by technology leaders results in some successes, but more failures, as the technology is pushed to its limits. The only enterprises making money are conference organizers and magazine publishers.  

**Trough of Disillusionment** | Because the technology does not live up to its overinflated expectations, it rapidly becomes unfashionable. Media interest wanes, except for a few cautionary tales.  

**Plateau of Productivity** | The technology becomes mature, stable and accepted within its target environment. Some early adopters continue to use the technology, but its wide adoption is limited.  

**Slope of Enlightenment** | The technology begins to mature and is adopted more broadly within its target environment. Applications become more common, but acceptance is still limited.  

**As of July 2019**

Source: Gartner  
ID: 368477
<table>
<thead>
<tr>
<th>Phase</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slope of Enlightenment</td>
<td>Focused experimentation and solid hard work by an increasingly diverse range of organizations lead to a true understanding of the technology's applicability, risks and benefits. Commercial off-the-shelf methodologies and tools ease the development process.</td>
</tr>
<tr>
<td>Plateau of Productivity</td>
<td>The real-world benefits of the technology are demonstrated and accepted. Tools and methodologies are increasingly stable as they enter their second and third generations. Growing numbers of organizations feel comfortable with the reduced level of risk; the rapid growth phase of adoption begins. Approximately 20% of the technology's target audience has adopted or is adopting the technology as it enters this phase.</td>
</tr>
<tr>
<td>Years to Mainstream Adoption</td>
<td>The time required for the technology to reach the Plateau of Productivity.</td>
</tr>
</tbody>
</table>

Source: Gartner (July 2020)

### Table 2: Benefit Ratings

<table>
<thead>
<tr>
<th>Benefit Rating</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transformational</td>
<td>Enables new ways of doing business across industries that will result in major shifts in industry dynamics</td>
</tr>
<tr>
<td>High</td>
<td>Enables new ways of performing horizontal or vertical processes that will result in significantly increased revenue or cost savings for an enterprise</td>
</tr>
<tr>
<td>Moderate</td>
<td>Provides incremental improvements to established processes that will result in increased revenue or cost savings for an enterprise</td>
</tr>
<tr>
<td>Low</td>
<td>Slightly improves processes (for example, improved user experience) that will be difficult to translate into increased revenue or cost savings</td>
</tr>
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</table>

Source: Gartner (July 2020)

### Table 3: Maturity Levels

<table>
<thead>
<tr>
<th>Maturity Level</th>
<th>Status</th>
<th>Products/Vendors</th>
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Gartner, Inc. | 447991
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<tr>
<th>Maturity Level</th>
<th>Status</th>
<th>Products/Vendors</th>
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<tbody>
<tr>
<td><strong>Embryonic</strong></td>
<td>In labs</td>
<td>None</td>
</tr>
<tr>
<td><strong>Emerging</strong></td>
<td>Commercialization by vendorsPilots and deployments by industry leaders</td>
<td>First generation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High price</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Much customization</td>
</tr>
<tr>
<td><strong>Adolescent</strong></td>
<td>Maturing technology capabilities and process understandingUptake beyond early adopters</td>
<td>Second generation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Less customization</td>
</tr>
<tr>
<td><strong>Early mainstream</strong></td>
<td>Proven technologyVendors, technology and adoption rapidly evolving</td>
<td>Third generation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>More out-of-box methodologies</td>
</tr>
<tr>
<td><strong>Mature mainstream</strong></td>
<td>Robust technologyNot much evolution in vendors or technology</td>
<td>Several dominant vendors</td>
</tr>
<tr>
<td><strong>Legacy</strong></td>
<td>Not appropriate for new developmentsCost of migration constrains replacement</td>
<td>Maintenance revenue focus</td>
</tr>
<tr>
<td><strong>Obsolete</strong></td>
<td>Rarely used</td>
<td>Used/resale market only</td>
</tr>
</tbody>
</table>

Source: Gartner (July 2020)

Evidence

1 Gartner’s Digital Workplace Survey was conducted online from 28 April through 11 May 2020 with 131 responses from members of Gartner’s Research Circle — a Gartner-managed panel.
Recommended by the Authors

Understanding Gartner's Hype Cycles
Employee Digital Dexterity Is an Essential Element of the Next-Generation Workforce
Create a Culture of Digital Dexterity With the 'New Work Nucleus'
Adopt Continuous Endpoint Engineering and Modern Management to Ensure Digital Workplace Success

Recommended For You

Summary Translation + Localization: 3 Keys to Persuading Your CFO to Use Product-Based Budgeting
2020 Gartner Supply Chain Top 25: Asia/Pacific
Supply Chain Priorities for Managing Customer Engagement During COVID-19 Recovery
In Focus Video: Amazon Prime Day — A Brand Strategy by Haus Laboratories
Technology and Service Provider Portfolio Benchmarks

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