Hype Cycle for the Digital Workplace, 2021

Published 12 July 2021 - ID G00747500 - 147 min read

By Analyst(s): Matt Cain, Michael Woodbridge

Initiatives: Digital Workplace Strategy

The continuing effects of the pandemic highlight the criticality of the digital employee experience and how it shapes the future of work. Application leaders can use this Hype Cycle to promote workforce digital dexterity and align technology strategies with emerging talent and business needs.

Analysis

What You Need to Know

During the pandemic, many office workers were absent from the physical workplace, and most interactions occurred virtually — putting the spotlight on the digital employee experience and new ways of working. This rapid escalation of digital work has been transformational, and most organizations are anxious to keep the momentum going. Many opportunities for further investment in the digital employee experience are represented in this Hype Cycle. The emerging imperative for most organizations is to harmonize the digital employee experience, a fundamental goal of the digital workplace.

Most employees have five main centers of attention in their digital employee experience. A role-based hub of applications and duties; a collection of personal and team productivity applications (the new work hub); and hubs sponsored by HR, IT and corporate communications (see Architect the Future of Work With the Digital Workplace Framework).

Digital workplace leaders must focus on ensuring that all employees are able to easily navigate this digital employee experience. Reflecting business needs and the future of work trends, organizations that prioritize applied technology services — whereby non-IT employees become productive with development, automation and analytics/AI technology, for example — will gain significant competitive advantage. This Hype Cycle explores the emerging technologies that will be most influential in the digital employee experience, spotlighting many key disciplines needed to maintain a competitive edge. It is largely focused on office workers; we have a separate Hype Cycle for Frontline Worker Technologies, 2021.

The Hype Cycle

This Hype Cycle continues to underscore the need for all office workers to attain proficiencies with personal and team productivity applications to work effectively in a hybrid environment. Toward that end, we consolidated and expanded our cloud office and new work nucleus coverage into a new innovation profile called the New Work Hub, which represents the essential tools any team needs to be productive. We added an aspirational element to the new work hub definition with the inclusion of augmentation services: development, automation and analytics components.

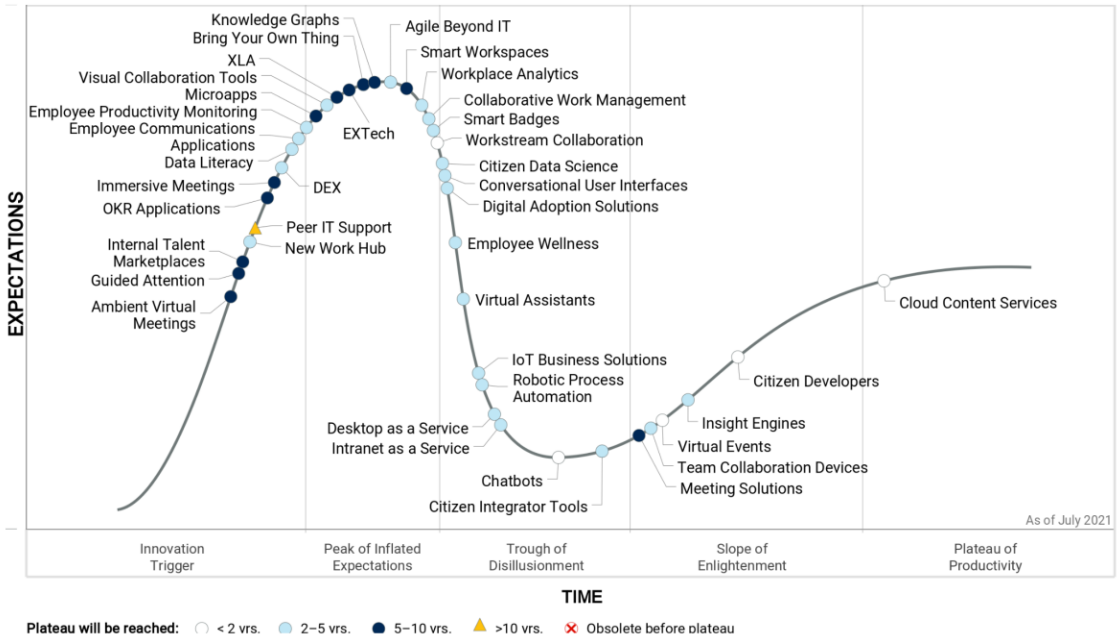
The new work hub includes online meeting tools, a category that has seen enormous interest due to the pandemic. Consequently, we added a new innovation profile — visual collaboration tools — and we flipped immersive workspaces to become immersive meetings, which joins its cousin, ambient virtual meetings.

The demand for greater remote team transparency and accountability also inspired us to add objectives and key results (OKR) applications to the Hype Cycle. The need for faster team clock speeds led us to add agile beyond IT, because that operating behavior has proven too valuable to be used only for IT projects.

The 2021 Hype Cycle also reflects the dual nature of the impact of communications. We added the Employee Communications Applications innovation profile to underscore the criticality of timely, effective and mobile communications for office and deskless/frontline workers, particularly in a time of sweeping changes in work patterns. The flip side of communications — where employees are bombarded with alerts, notifications and updates from both machines and humans — is a significant contributor to work fatigue. Consequently, we added the Guided Attention innovation profile to formally kick off a discipline to study and manage employee focus.

Finally, the need to continuously improve the digital employee experience led us to initiate a discipline we call DEX, or digital experience management. Multidisciplinary DEX tools combine performance and usage data from endpoints with contextual sentiment from employees about technology, use and add an organizational context from workplace analytics. DEX tools apply machine learning to drive automation to eliminate digital friction.

Figure 1: Hype Cycle for the Digital Workplace, 2021



Source: Gartner

Downloadable graphic: Hype Cycle for the Digital Workplace, 2021

The Priority Matrix

The pandemic has elevated the priority of various innovation profiles. In the transformational category, we have smart workspaces, which is of significant interest since most organizations are rethinking the purpose of their office space. Many organizations will be moving toward a shared seating model and are wide open to re-creating the office experience with apps for scheduling, wayfinding and in-office procurement, along with IoT services for authentication, heating, cooling, lighting and room occupancy. Another important innovation — virtual events — has become essential for business continuity during the pandemic, and the category is generating heated debate about the postpandemic future of these events.

The impact of IoT services will continue to reverberate outside the office, which led to the addition of IoT business solutions, ranked as transformational, as is citizen data science, the flip side to IoT. IoT generates enormous quantities of data, and making use of such data will increasingly become a mainstream business duty, along with data generated from other sources. Data literacy will be an essential digital dexterity element to ensure organizational prosperity through the end of the decade.

Virtual assistants also get the transformational nod, and we see an interesting pivot toward active nudging of employees toward best practices for well-being, time utilization and application navigation, with a wide variety of applications. Best-practice nudges are included in our EXTech profile. Finally, we would be remiss not to call out the important service agreement discipline called XLA, or experience-level agreement. XLAs highlight the expansion of the charter of the IT organization from operational fitness to a broader focus on the overall digital employee experience.

Table 1: Priority Matrix for the Digital Workplace, 2021

(Enlarged table in Appendix)

Benefit	Years to Mainstream Adoption			
	Less Than 2 Years	2 - 5 Years	5 - 10 Years	More Than 10 Years
Transformational		Agile Beyond IT Citizen Data Science Conversational User Interfaces Employee Communications Applications IoT Business Solutions New Work Hub Virtual Assistants	Internal Talent Marketplaces Smart Workspaces	
High	Chatbots Citizen Developers Cloud Content Services Virtual Events Workstream Collaboration	Collaborative Work Management Data Literacy Desktop as a Service DEX Digital Adoption Solutions Insight Engines Robotic Process Automation Smart Badges Workplace Analytics	EXTech Guided Attention Immersive Meetings Knowledge Graphs Meeting Solutions XLA	
Moderate		Citizen Integrator Tools Employee Productivity Monitoring Employee Wellness Intranet as a Service Team Collaboration Devices Visual Collaboration Tools	Bring Your Own Thing Microapps OKR Applications	Peer IT Support
Low			Ambient Virtual Meetings	

Source: Gartner (July 2021)

Off the Hype Cycle

We had a larger-than-normal turnover this year due to pandemic-driven workplace changes. As mentioned previously, we expanded the definition of cloud office while we transitioned it to the new work hub. Enterprise social networking graduated into full maturity. Employee reward and recognition as well as voice of employee were folded into EXTech. Digital experience monitoring was rolled into DEX. Content flow was removed because it failed to thrive (but might come back).

On the Rise

Ambient Virtual Meetings

Analysis By: Christopher Trueman

Benefit Rating: Low

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

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 three ways: through always-on meeting rooms/channels; gamified, social spaces; or instant-connectivity to colleagues via video conference based on presence status. In this way, AVM apps make video an omnipresent part of the work environment.

Why This Is Important

Ambient virtual meetings (AVMs) emerged from the meeting solutions market in response to the unique needs of remote workers. AVM apps focus on ad hoc collaboration between workers and allow for persistent video channels or gamified meeting spaces. AVM apps promote more social and collaborative work styles; encouraging spontaneous meetings, the virtual equivalent of chatting to someone in the office. They should be treated as a complement to, not a replacement for, existing meeting solutions.

Business Impact

AVM apps add novel ways to engage remote/hybrid workers through video conferencing. They are useful for IT leaders and managers seeking to increase social collaboration.

This engagement style can:

- Build team cohesion
- Mitigate feelings of isolation
- Improve responsiveness
- Resurrect serendipitous meetings

- Create more productive work styles

Teams spread across different time-zones (i.e., more than four to five hours difference) will see a reduced impact due to AVM apps' reliance on real-time communication.

Drivers

- COVID-19 caused a significant shift to hybrid and remote working. Most organizations have come to recognize that video meeting tools are a fundamental requirement to maintaining productivity and team cohesion in a hybrid work environment.
- Meeting solutions and other collaboration tools allowed structured and planned collaboration activities to continue, but spontaneous interactions and unstructured team conversations proved difficult to replicate with these tools. This resulted in IT leaders and managers exploring alternative solutions, such as AVM apps.
- AVM applications provide novel capabilities which make spontaneous and unstructured conversations more tenable. They do this in one or more of the following ways: (1) By creating persistent, video-enabled, virtual rooms or channels. Entering one of these channels is analogous to opening your office door, inviting colleagues to stop in randomly throughout the day to converse; (2) By introducing spatial video capabilities, where users can only hear/see other users in close proximity to them within the app. In these setups, users are represented as an icon or avatar and can either click on colleagues to join them or can roam a 2D virtual world freely using the arrow keys (or other input); and (3) By providing richer presence statuses and increased transparency into meetings taking place within a team or cohort. Users see who colleagues meet with in real time and can pull "available" colleagues into meetings.
- Most of the major technological hurdles have been solved by the meeting solutions, web-conferencing and communications platform as a service (CPaaS) providers that preceded today's AVM vendors.
- AVM apps provide the greatest benefits to teams or groups whose activities require frequent contact or are conversationally driven.
- With hybrid working now becoming the norm, even teams with infrequent conversation needs may find AVM or other collaboration tools necessary to bridge the gap created by moving work out of the office.

Obstacles

- Since most IT organizations prefer to minimize the number of meeting platforms they support, the value that AVM apps can bring has had difficulty resonating with enterprise IT buyers as they cannot replace traditional video conferencing tools.
- The use of AVM tools is still very new. Cultural and work style changes will be required for successful adoption of AVM apps at most organizations. This means that strong messaging and example setting from leadership/team managers will likely be needed. Expect a heightened focus to be placed on video/meeting etiquettes.
- AVM apps are built around real-time video conferencing capabilities. As such, they are only useful to teams with similar, overlapping work hours. AVM apps do not work well for teams spread across time zones that are more than four or five hours apart.

User Recommendations

- Evaluate AVM apps as a means for increasing the engagement and visibility of remote or geographically separated workers by first testing them as social gathering spaces among a pilot group.
- Align your organization's use cases for AVM applications with the most appropriate vendor(s) by assessing each vendors' strengths and weaknesses. Some AVM vendors specialize in internal, team collaboration, others specialize in education, large events or social gatherings.
- Do not become overly dependent on any individual AVM vendor. AVM apps are an emerging market. IT leaders should be prepared to switch vendors as the market evolves. Gartner expects many vendors to enter or exit the market, or to be acquired over the next few years.

Sample Vendors

Bramble; Gather; Pragli; Remo; Remotion; Shindig; Sococo; SpatialChat; Tandem; Teemyco

Gartner Recommended Reading

Product Manager Insight: Talent and Resourcing Through 2025 — Superheroes or Superteams?

Magic Quadrant Meeting Solutions

Critical Capabilities for Meeting Solutions

Digital Workplace Applications KI Primer

Digital Workplace Strategy KI Primer

Cool Vendors in Social Software and Collaboration, 2017

Guided Attention

Analysis By: Craig Roth

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Definition

Guided attention is a strategy that uses technology and worker-driven processes to help workers notice pieces of information that are important to them while avoiding distractions and wasted time from unimportant information.

Why This Is Important

Digital workplaces consist of a wide variety of communication, collaboration, social and content tools.

A side effect of the success of each of these tools is that it yields yet another thing to check (YATTC). Without guiding attention, productivity is decreased and workers are increasingly in danger of not noticing an important signal due to all the background noise and clutter of their information environment.

Business Impact

Inability to guide attention impacts decision quality and reaction time. Decision quality decreases when decision makers are unaware of key information. Poor employee satisfaction and engagement results when workers endure interruptions and waste time sorting through irrelevant information.

Reaction time increases when signals that should spur quick action are noticed in a timely fashion. Boosting worker alertness using technology and design yields a cascading improvement on team effectiveness.

Drivers

- **Improvements in machine learning:** Cloud office suites enable centralized tracking of activities indicating interest. This data and social graph can be leveraged by "Everyday AI" to determine relevance of future content to a particular worker. By 2026, 25% of information and conversations that workers process will be algorithmically promoted or demoted, growing to 50% in 2030.
- **Proliferation of attention demanding applications:** The number of applications where a critical bit of content could appear continues to increase. So does the amount of unimportant information that obscures insights and drains the time and energy of the worker. Office 365 now contains 13 components that could be YATTC (they can contain information a worker would be in danger of missing if they aren't proactively checked). Applications configured to send notifications often contribute to the noise when they are sent without consideration of relevance to current work and other notifications demanding attention. There has been a rapid shift into workstream collaboration tools, but they have fewer features to guide attention than popular email clients.
- **Rethinking of work spurred by the pandemic.** Organizations had to rethink how collaboration takes place with a distributed workforce. Usage of virtual collaboration tools (existing or newly purchased) increased. Processes and practices were adapted to the digital workplace. Mobile devices are now more prevalent. A Gartner survey revealed that in November and December of 2020, 10% more of workers' time is now spent on portable devices when compared to 2019. This increases the need for guiding attention to information that is fractured across devices.

Obstacles

- Software often lacks capabilities to guide attention. If it does have them, the capabilities are often obscure and difficult to use.
- Businesses have generally been successful at demanding more time and engagement from workers to address the increased pace of work. Mobile devices raise expectations of monitoring content and message feeds at any time.
- The attentional aspect of user experience is absent from product evaluations, so vendors deprioritize features such as sorting by relevance, granular notification options and rules. Workers lack the language (commonly accepted goals and terms) to demand these improvements.
- Workers do not complain due to learned helplessness (assuming it is insolvable), competitive advantage (their better attentional skills or discipline put them at an advantage over peers) or fear of sounding incompetent for saying they cannot manage.

User Recommendations

IT leaders should take an enterprise approach to improve decision quality and reaction time with concrete actions in digital workplace tools and processes:

- Take ownership of guiding attention and the unique opportunity of an IT leader to establish best practices and communicate them to the business.
- Research the information consumption habits and challenges of key roles in the organization.
- Change application defaults or predefined rules (such as predefined routing or notification defaults) where possible.
- Use capabilities or, in rare cases, new products to address the most glaring inhibitors of guided attention. For example, deploy conditional formatting in email for sales that highlights customer communications in purple. Or purchase an augmented analytics tool to discover trends hidden in data that a fraud team has been slow to recognize.
- Update user interface guidelines to address alerting, notification, subscription, and blocking of information on interfaces.

Internal Talent Marketplaces

Analysis By: Helen Poitevin

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

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.

Why This Is Important

The COVID-19 pandemic and the subsequent societal and market shifts have made adaptability and resilience critical. Upskilling and reskilling have long been promoted as necessary, due to the potential of technological unemployment with the rise of AI and automation. Agile learning is the necessary enterprise response, including learning through experiences. Internal talent marketplaces are key to enabling adaptability, resilience and agile experiential learning.

Business Impact

Early adopters of ITM have been using this capability to:

- Understand their workforces through a different lens — focused on the work, rather than the role.
- Gather data and support their talent through new and more agile methods.
- Address rapidly changing business priorities or delivery models, and redeploy existing employees in order to improve organizational sustainability.
- Encourage and track employee development and collaboration in new ways, with a focus on skills.

Drivers

- Agile and composable organizations will require more flexible deployment of workers across projects, products and other initiatives. Composable businesses are architected for real-time adaptability and resilience in the face of uncertainty. They need people with learning agility to adapt to changing skills demands. They also need to be able to align a highly networked workforce to the work that needs to get done in a dynamic way.
- HR and other organizational leaders benefit from the data and insights from internal talent marketplaces to support workforce planning and other talent processes. Team, project and product leaders within organizations benefit from more flexible staffing and improved visibility into talent. When deployed correctly, employees and contingent workers have better visibility into work opportunities, and can stretch and build up their skills and experiences in order to grow their portfolio of work and career.
- Hype around the internal talent marketplace has increased. Further point solutions have emerged in the market. HCM suite providers have acquired or developed capability to meet increasing demand and interest. Maturity in applying AI to detect, infer and map relationships between skills has increased, as has the use of AI techniques to automatically match talent to work opportunities.

Obstacles

Organizational challenges impeding adoption include:

- Talent hoarding.
- Lack of cultural readiness for more dynamic and adaptive organizational models.
- Lack of readiness to use AI-enabled skills graphs to infer and detect skills data which is more granular and detailed compared to existing competency frameworks.
- Lack of trust in AI-generated skills data.

Data related challenges include:

- Access to data regarding worker and worker experiences, knowledge and skills.
- Use of organization-specific and more granular skills to enable better matching.

- Difficulties in balancing privacy and the need for significant amount of talent data to enable better user experiences through more relevant matching.

User Recommendations

- Pilot internal talent marketplaces within business units or lines of business that use adaptive or agile organization models, or work with progressive talent management leaders who want to deliver agile skills development.
- Move forward with caution, given the emerging state of these technologies, and anticipate significant investments of resources into co-developing products with application providers.
- Use AI along with multiple data sources to generate initial skills and experience data. Ensure that there are workflows that allow employees to correct, add and refine this data over time.
- Invest in design thinking, work design and workplace ethnography. Deconstructing jobs into deliverables, skills and capabilities, and then allowing employees to bid for these jobs, represents a significant change to management practices.

Sample Vendors

365Talents; Ascendify; Catalant Technologies; Degreed (Adepto); Eightfold AI; Fuel50; Gloat; Oracle; ProFinda; Workday

Gartner Recommended Reading

Innovation Insight for Internal Talent Marketplaces

Future of Work Trends Will Drive New Technologies to Track, Develop and Deploy Talent

New Work Hub

Analysis By: Gavin Tay

Benefit Rating: Transformational

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition

New work hub is a customer-assembled collection of personal and team productivity applications, along with services for development, automation and analytics, created for a particular constituency.

Why This Is Important

Enterprise adoption of the new work hub surged on account of the COVID-19 pandemic, a general preference for cloud deployments and the desire to reduce costs, redeploy IT staff, drive simplicity and provide more functionality to users. Organizations desperately want to offer their workforce the most attractive new features, especially as hybrid work becomes a long-term arrangement, including mobile apps, content discovery tools and AI available through cloud deployments only.

Business Impact

New work hubs are the basis on which vendors innovate and build ecosystems through add-ons and integrations. They have become widely adopted and supported by a variety of collaboration styles including video, conversational and social as well as the more conventional email and IM. Organizations adept at using a new work hub prior to COVID-19 had a much easier time pivoting to mandatory remote work.

Drivers

- Driven by the COVID-19 pandemic, business innovation is accelerating continuously and driving new work hubs.
- Organizations need to transition into an era of AI, machine learning and conversational experiences, on account of maturing SaaS.
- The ambition and ability of the workforce to use technology for better business outcomes, what we call “digital dexterity,” is an essential talent ingredient for continued organizational prosperity.
- To succeed in the long term, organizations must take a proactive approach to ensure that employees have the digital skills to exploit continuous technology change.
- Most organizations are moving to a stack of SaaS-based personal and team productivity applications, such as Microsoft 365 or Google Workspace.
- Migrations to the cloud are treated as infrastructure and operations projects, where uptime, security, compliance, governance and full provisioning are the marks of success.

Obstacles

- Three-decade-old collections of locally deployed personal and team productivity applications — such as email — are being replaced by an ever-changing portfolio of cloud-based applications that have substantially new capabilities, which we call the "new work hub." This shift is not only technically complex but also hard to keep up with.
- Given the significant shift from conventional technology and the continuous change new work hubs entail, leveraging them as an extension rather than merely a replacement can be overwhelming to end users.
- Driving individual and team accountability, transparency, efficiency and autonomy via new work hubs requires a conscious departure from on-premises predecessors, which is a complex process.

User Recommendations

- Focus beyond current-term technologies as chosen new work hub solutions may not meet all collaboration and communication requirements of users.
- Take note of the new work hub vendors' roadmaps and product announcements closely. The cloud model assumes almost continuous enhancement with new features and improvements. 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.
- Deem the new work hub to be a source of continuous innovation in a form that is relatively easy to adopt. Innovations like everyday AI, cross-tool integration and better meetings are likely to come from solutions that innovate in the cloud.

Sample Vendors

Adobe Workfront; Dropbox; Google; Microsoft; Salesforce (Slack); Zoho; Zoom

Gartner Recommended Reading

Digital Workplace Applications Primer for 2021

Market Guide for Cloud Office Migration Tools

Toolkit: Data Slicer to Derive a Cloud Office Migration Tools Shortlist

Quick Answer: What Is Microsoft Viva?

Expert Insight Video: Understanding Communications Culture and How It Shapes a Digital Workplace Applications Portfolio

Peer IT Support

Analysis By: Chris Matchett

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Definition

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

Why This Is Important

Peer IT support is happening in many places; but often it is organic and not formally defined. This is happening in both the consumer world on forums like commercial product support, Reddit and Facebook groups, and also in companies where application or product teams have already set up their own forums or Slack channels. While this organic growth is key to the importance of the concept and long-term prospects, it also makes it difficult to measure how many organizations are doing this.

Business Impact

- Peer support may decrease the workload of the Level 1 and 2 support teams, reduce costs, and allow the IT service desk to concentrate on other activities.
- Incident resolution can be expedited when the expertise resides outside the I&O organization.
- Consumer satisfaction with I&O can be improved by building engagement and trust when IT offers flexible support choices.

- The service desk hierarchy will be more fluid and responsive, and it will provide direct access to product support teams where DevOps is utilized for services of innovation.

Drivers

- Gartner's research into business consumer support preferences in the digital workplace confirms that younger 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.
- I&O leader interest in peer support has surged due to the increased shift to remote work resulting from the COVID-19 pandemic, and the need to ease IT service desk workload.
- Many organizations deployed collaboration tools such as Microsoft Teams or Slack during 2020.
- Some IT service management (ITSM) tool vendors are beginning to provide features that facilitate peer IT support.

Obstacles

- Although peer support is thriving outside of formal support practices, I&O leaders have been slow to introduce formal channels.
- Older business consumers prefer to contact only traditional support channels.
- Some business leaders don't want non-IT staff spending any of their own time working on IT issues.
- Lockdown-forced remote working has led to a drop in "ask a colleague for help" frequency according to our digital workplace study of more than 10,000 business consumers in late 2020.

User Recommendations

- Analyze the preferences and requirements of the user community before proceeding to roll out new support channels.
- Seek out business unit IT support that is already occurring in your organization, and identify pockets of knowledge within the employee community.
- Establish formal support channels that enable peer support for compatible audiences.
- 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 and reward employees that engage in peer support that drives digital dexterity and business productivity. Gamification approaches may help.

Gartner 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

2019 Strategic Roadmap for IT Service Management

Quick Answer: How to Build a Champions Network to Scale the Digital Workplace

Top 7 Insights From the 2021 Digital Worker Experience Survey

OKR Applications

Analysis By: Aapo Markkanen, Helen Poitevin

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Adolescent

Definition

Objectives and key results (OKRs) is a flexible goal-setting framework used to convert enterprise objectives and priorities into a concrete and measurable operational results model for setting and managing strategic goals. It is gaining interest and adoption among executives who seek ways to improve strategy execution in their organizations. OKR applications refer to purpose-built software products that have been developed for planning, instrumenting, monitoring and updating OKRs.

Why This Is Important

As OKRs move further into the mainstream, OKR applications are needed to improve the model's usability, effectiveness and scalability. Without appropriate tooling, OKRs can be a laborious method to utilize. The level of effort that an undertooled OKR program requires prevents many organizations from making use of OKRs and undermines the value it can deliver for the ones that have adopted them.

Business Impact

By deploying OKR applications, organizations are able to:

- Expand the scale and complexity of their deployments, without compromising on important methodological aspects such as alignment and transparency or risking pitfalls such as stakeholder pushback and employee inertia.
- Save on the expenses of developing internal tools or customizing general-purpose tools that an in-house approach to achieving an adequate level of tooling would require.

Drivers

- Following the maturation of agile methods and workflows in development functions, organizations are trying to find ways to increase agility in strategy. OKRs are viewed as one of the most promising techniques to do so.
- Digital transformation and product centricity in historically nontechnological industries are shifting attention to best practices that have proven successful in the technology sector. OKRs are one such idea that is migrating from tech to traditional enterprise.
- Remote working and distributed teams are causing friction when it comes to prioritization and alignment of efforts, as many of the everyday “safety nets” of physically colocated work disappear. OKRs, especially when enabled with modern tooling, can help address the related shortcomings.
- The increasingly extensive tooling of the digital workplace, overall, is drawing practitioners’ attention to new areas that previously have been handled largely manually. The key benefits of purpose-built OKR applications — such as visualizations, analytics, third-party integrations and innovative UIs — are tangible for anyone who is proactively looking for such areas of improvement.

Obstacles

- The OKR method is largely unstandardized, implemented through different and often contradictory approaches. OKR applications struggle to accommodate that methodological fragmentation within their feature sets.
- Most organizations lack a culture of using goals as systematically as what the OKR method requires. This makes large deployments dependent on change management, which acts as a barrier for the applications.
- Service providers supporting business process reengineering and change management seldom leverage OKRs in their engagements. This lack of universally recognized service partners makes it harder for OKR applications to be deployed as turnkey solutions.
- Given the digital workplace’s increasing tooling, many leaders have doubts about adding another point solution, especially if some of the existing tools deliver similar capabilities. For example, collaborative work management is one such horizontal alternative.

User Recommendations

End users planning to deploy OKRs for the first time, or looking for ways to retool an existing deployment, should:

- Ensure that the organization needs OKRs (and their overheads) in the first place by evaluating how well the existing goal-setting method delivers strategic focus and alignment.
- Map the tooling options by evaluating three to five dedicated OKR application vendors in terms of features, implementation support and customer references.
- Explore synergies within existing tools by assessing how well general-purpose alternatives, such as collaborative work management and low-code platforms, could deliver the needed use cases.
- Prepare for the OKR deployment or expansion by having key staff trained on the method, hiring an OKR coach and discussing use of OKRs with the organization's established service partners.
- Clarify the model's methodological aspects by identifying what process elements are unclear, reconciling them among the key staff and documenting the agreed approach.

Sample Vendors

Ally.io; Betterworks; ByteDance (Feishu); Fitbots; Gtmhub; Perdoo; Profit.co; Weekdone; WorkBoard; Workpath

Gartner Recommended Reading

How CIOs Can Implement OKRs That Align and Focus Their Teams

Quick Answer: Which Technologies Can Support an Objectives and Key Results Program?

How Do OKRs Fit Into the Digital Workplace?

Leverage OKRs to Improve Product Management's Responsiveness to Change

Immersive Meetings

Analysis By: Christopher Trueman

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition

Immersive meetings involve the use of extended reality technology (e.g., XR, VR, AR and MR) to host meetings, gatherings and events. Attendees — represented by avatars — are able to see, move and interact with shared virtual elements to simulate an in-person meeting or event experience.

Why This Is Important

Immersive meeting tools allow in-person meeting and event experiences to be more faithfully recreated in a virtual setting. Traditional video conferencing and meeting solutions do not provide the same level of immersion or participant engagement as they cannot convey the same sense of presence, nuanced body language or gestures. Hosting an immersive meeting results in a more natural and casual meeting experience and could ease meeting fatigue.

Business Impact

Immersive meetings can scale from very small meetings to more than 1,000-attendee virtual events. Meeting use cases where personal connections are highly valued will see the greatest benefits from these technologies.

There are several added values provided by these technologies over existing video conferencing and meeting solutions, such as:

- Greater attendee/employee engagement
- Reduced distractions/multitasking
- Natural gestures and body language
- Replacement of additional physical meetings (saving travel costs)

Drivers

- COVID-19 caused a significant shift to hybrid and remote working. Most organizations have come to recognize that collaboration and meeting tools are fundamental requirements to maintain productivity and team cohesion in a hybrid work environment.
- Employee preferences have shifted in favor of remote or hybrid working. Organizations are reevaluating their strategies and processes as a result of this shift, making them open to disruptive new technologies such as immersive meeting tools.
- Immersive meetings provide new capabilities that allow additional meeting use cases to be digitized. As such, they can further reduce the need to travel and add to the cost savings from traditional video conferencing. Companies seeking to actively reduce travel in order to meet corporate sustainability goals can tie immersive meeting technology to these key initiatives.
- Proven success stories from organizations pioneering VR collaboration and immersive meeting tools will drive more companies to pilot and adopt these solutions.
- Initial attempts to move in-person meetings and conferences to virtual events hosted on video conferencing platforms were met with, at best, moderate success in 2020. There is a growing interest in using VR and other technologies to build more engaging virtual events going forward.
- Using VR to simulate a virtual conference or event space allows experienced event-planning teams, advertisers and vendors to leverage more of their skill set in planning the event than video conferencing platforms would allow. Virtual event spaces can be planned and staffed similar to in-person events. Banner advertisements, vendor booths, stages, showrooms, information desks, gathering spaces, signage and other aspects of in-person events can be recreated in VR.
- Head-mounted display (HMD) technologies will see significant improvements and price reductions in the coming years, reducing the cost of entry.

Obstacles

- Immersive meetings do not replace traditional video conferencing.
- HMDs are expensive today, and a lack of standardization in display technologies, controllers and input devices means that selected devices can directly limit or enhance the user experience, and make setup difficult.
- The creation of custom environments or custom-made event experiences requires specialized skill sets that most IT departments lack today. Extensive professional service engagements or commissioned work can inflate costs if required for a particular event or activity.
- VR can cause users to experience motion sickness, eye strain, headaches and other physical symptoms. This can make long meetings or events challenging for new users who have not had sufficient experience with the technology to adapt to it. Improvements to hardware, devices and VR collaboration software to mitigate these adverse reactions are still in an early, experimental stage, with different platforms offering different, customizable options.

User Recommendations

- Start any virtual or augmented reality implementation by carefully considering the use cases for VR collaboration and immersive meetings within your organization.
- Create a successful initial pilot by targeting an area where there is a clear benefit for VR collaboration and immersive meetings over a traditional video conferencing approach.
- Link VR collaboration and immersive meetings to key business initiatives, such as the organization's digital transformation, by coordinating your actions with key stakeholders.
- Supplement any lack of skills or experience with immersive meetings within IT by leveraging professional services, training and other resources available from your XR software partners or third parties.

Sample Vendors

AltspaceVR; Arthur; ENGAGE; Glue; Kazendi; meetingRoom; MeetinVR; Spatial; The Wild

Gartner Recommended Reading

Virtual Reality and Augmented Reality for Remote Workers

Best Practices for Immersive Learning in Education

DEX

Analysis By: Dan Wilson, Stuart Downes, Autumn Stanish

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition

Digital employee experience management (DEX) tools aggregate performance and usage data from endpoints, contextual sentiment from employees about the use of technology and organizational context from workplace analytics. They apply machine learning to derive insights-driven automation to eliminate the employee experience degrading and productivity inhibiting issues.

Why This Is Important

Despite significant digital workplace investments, most IT leaders are unable to measure digital employee experience. While digital experience monitoring (DEM) is important, most DEM tools lack organizational context and sentiment data, as well as automation capabilities. These additional features enable DEX tools to become a strategic differentiator that can reduce overhead and improve experience, which is paramount given increased pressure organizations are under as the result of the pandemic.

Business Impact

DEX provides greater visibility and management of digital employee experience. Specific impacts include:

- Transparency into technology performance and employee sentiment around the technology
- Adding organizational context to identify how technology is used by persona and by business processes
- Identification of technical issues that prevent employee productivity
- The use of insights (ML rather than workflow or heuristics) to drive automation that eliminates problems and improves employee experience

Drivers

- With remote work, digital employee experience now makes up the majority of overall employee experience as employees mostly interact with peers, vendors and customers predominantly through technology. This demands deeper visibility into, and management of, experience.
- The need to gather employee sentiment in the context of technology use, rather than periodic or transaction surveys; which more accurately captures the impact that performance issues have on employees' work.
- IT leaders are looking to baseline and measure progress of technology improvement efforts, and to reduce administrative overhead through the use of automation.
- Increased acceptance of remote work has significantly increased service desk call volumes and agents require faster access to device configuration and performance data. Increased call volume has also increased wait times, so employees are looking for more self-help capabilities or automatic remediation of issues.
- The increased threat of cyberattacks demands faster identification and remediation of configuration issues and patching of vulnerabilities. Monthly patching cycles are proving ineffective to minimize modern threats.
- Several DEM or UEM tools have matured into or added DEX capabilities, and are adding more value though better insights driven by machine learning. Those insights also drive broader use of and better accuracy of automation.

Obstacles

- Those in a legacy IT culture that doesn't see a need for more data, doesn't trust or whose job security is threatened by automation.
- A lack of skill set to implement and use the tools.
- The cost and effort required to acquire a new DEX tool, upgrade existing tools to gain additional capabilities, or integrate DEM, workplace analytics, cloud office or SaaS management, and UEM tools.
- An "ignorance is bliss" mindset, fearing that a sudden unveiling of the massive volume of issues inhibiting workplace technology performance everyday will make them look bad.
- Organizations operating in countries, states or industries, as well as those with union workers, may have legal or regulatory limitations on data collection and use. Especially an individual's data that may be viewed as an employee privacy violation.
- The lack of maturity and feature parity among representative and similar tools; including common APIs for integration.

User Recommendations

New to the Hype Cycle, DEX has evolved from mature UEM, DEM and workplace analytics tooling, though the emphasis on insights (ML) driven automation positions hype at the pre-Peak of Inflated Expectations. For organizations that have not invested in DEX, Gartner recommends:

- Refrain from operating in a vacuum by promoting the value of DEX to gain C-suite support, selecting tools that integrate with DEM, ITSM, UEM and endpoint security tools, and collaborating with HR and Legal to ensure policy and legal compliance.
- Avoid tool sprawl by reviewing existing capabilities or potential upgrades before buying new.
- Upskill IT staff with a new focus on eliminating repeatable tasks to create capacity for more business value-added work, such as training ML engines and employee enablement.

Sample Vendors

1E; Aternity; ControlUp; Lakeside Software; Nanoheal; Nexthink; VMware

Gartner Recommended Reading

Enhance Digital Workplace Operations With Machine Learning and Automation

Predicts 2021: Digital Workplace Infrastructure and Operations

How to Monitor and Troubleshoot Remote Workers' Application Performance

Observe, Measure and Assist: Three Emerging Ways to Drive Workforce Digital Dexterity

Embrace Windows 10 Modern Management to Enable a Highly Distributed Digital Workplace

Market Guide for Digital Experience Monitoring

At the Peak

Data Literacy

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

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition

Data literacy is the ability to read, write and communicate data in context, with an understanding of the data sources and constructs, analytical methods and techniques applied. It is the ability to describe the use-case application and resulting business value or outcome.

Why This Is Important

Data and analytics are pervasive in all aspects of all businesses, in communities and in our personal lives. The ability to understand, interpret and act upon data — data literacy — is increasingly foundational to the digital economy and society. Data literacy helps explain to the board how data and analytics manifest in a company's use cases, explain how to identify, access, integrate and manage internal and external datasets, and describe advanced analytics techniques and enabling AI.

Business Impact

Data-driven enterprises require explicit and persistent organizational change to achieve measurable business outcomes. Employees know their organization is serious about change only when they see their leaders changing their own behavior. CDOs need to promote and orchestrate "leadership moments" where they act as role models, exemplifying new cultural traits at critical points. Central to success will be the ability to guide the workforce by addressing both data literacy and data-driven culture.

Drivers

- With the steady rise of the digital economy, and the need for businesses to be digitally literate, there is growing recognition of the role that employees' data literacy plays within an organization's overall digital dexterity.

- The role of the data and analytics function has changed. It is now at the core of an organization's business model and digital platforms.
- CDOs can emulate their higher-performing peers by putting much more emphasis, energy and effort into meeting the change management requirements of their data and analytics strategies.
- Defining what data-driven behaviors are expected, using a "From/To/Because" approach, is central to employee development plans. It ensures that creators, consumers and intermediaries have the necessary data and analytics skills, knowledge and competencies.
- CDOs need to take immediate action to create and sustain data literacy. Quick wins build momentum, but lasting and meaningful change takes time because it requires people to learn new skills and behave in new ways.

Obstacles

- Lack of common data literacy models/frameworks/standards
- A piecemeal approach to training and certification
- Aversion to change
- Lack of talent and poor data literacy
- Lack of initiatives to address cultural and data literacy challenges within strategies and programs
- "Data literacy" means different things to different providers: from enhanced data visualization skills to fostering curiosity about data more broadly
- Overall adoption will still take years

User Recommendations

- Create a strong narrative vision of desired business outcomes, particularly with respect to innovation. Raise awareness through storytelling.
- Call out examples of "good" and "bad" data literacy to promote desired behaviors.
- Work with stakeholders who have enthusiasm and appetite, and who recognize that improved data literacy is a factor for success.

- Partner with HR and business leaders to identify the level of data literacy, learning goals and outcomes for various job roles and personas. Use data literacy assessments to evaluate current data literacy levels and desire to participate.
- Go beyond vendor product training to focus on people's other role-related skills. Use a mix of training delivery methods (classroom, online, community, on the job) to improve overall learning effectiveness.
- Align training and self-service solutions with a broader data literacy portfolio to meet the data literacy needs of both data consumers and creators.

Sample Vendors

Avado; Coursera; Data To The People; Gartner Consulting; Pluralsight; Skillsoft; The Center of Applied Data Science (CADS); The Data Lodge; Udacity; Udemy

Gartner Recommended Reading

Roadmap for Data Literacy and Data-Driven Business Transformation: A Gartner Trend Insight Report

Tool: Communicating the Need for Data Literacy Improvement

Chief Data Officers Must Address Both 'Skill' and 'Will' to Deliver Data-Driven Business Change

Tool: Data Literacy Personas

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

Employee Communications Applications

Analysis By: Mike Gotta

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition

Employee communications applications (ECAs) enable organizations to plan, create, manage, execute and analyze internal communications. The employee value of ECA is based on delivery of relevant content, bottom-up feedback to leadership, and unified access to key applications.

Why This Is Important

Effective communications is strategic in a digital workplace, especially for making frontline workers feel informed and included. ECA enables leadership and those in communicator roles to flexibly interact with workers via multichannel, multidevice experiences and personalized audience segmentation. ECA solutions can positively affect employee experience by creating a sense of belonging, keeping staff aware of safety topics, providing organizational information, and reinforcing business goals.

Business Impact

- ECA solutions help organizations reach the entire workforce, especially staff with limited technology options, so they understand what's going on and what's being asked from them.
- ECA tools provide communicators (those in formal roles responsible for certain types of messaging) the means to plan, manage and analyze communication efforts.
- Workforce value of ECA is based on staff receiving content, providing feedback, and gaining streamlined access to key applications (payroll, benefits and shifts).

Drivers

- ECA tools are part of a broader collection of employee-facing solutions designed to influence and improve both employee experience and organizational culture.
- Leadership teams have largely recognized the value of more effective technology and information sharing with frontline workers who have generally been technologically disadvantaged. While ECA tools are often used across the workforce, they can focus on certain workforce segments. Objectives include better engagement, retention and operational effectiveness.
- Dissatisfaction with email and legacy intranets is encouraging leadership to explore modern ECA tools designed for multichannel and multidevice experiences (including digital signage) with the ability for personalized experiences based on workforce segmentation.
- Campaign-style features enable sequences of messages to be coordinated and delivered to employees following a “journey” concept to “tell a story” related to strategic goals. The concept of communication journeys shifts the focal point of communications from broadcast and delivery to understanding and behavior change to work in new ways and identify with the enterprise mission.
- ECA solutions are primarily used for organizational communications. However, ECA usage is slowly shifting to include operational communications with more emphasis on collaboration and work management (creating synergies with workstream collaboration tools).
- Advanced ECA analytics creates workforce insights that appeal to new stakeholders outside those deciding on ECA strategies, such as those involved in voice or employee and people analytics.
- Vendors in the ECA and emergency or mass notification service (EMNS) are slowly maturing to handle certain types of crisis and urgent communication use cases but differences remain entrenched as to EMNS unique value.

Obstacles

- Business and cultural value from ECA is not commonly known outside those in communicator roles (often in HR and Corporate Comms.), making cost vs. value debates common.
- Deep analytics creates suspicion over tracking or misuse of data, which causes staff (especially frontline workers) to not download the mobile app to personal devices.
- Strategists involved in ECA tool selection can have imperfect market awareness of vendors or insight to features needed to construct effective evaluation criteria.
- ECA vendors come from many different adjacent markets, which makes decision-making complex to find a single solution. Some vendors offer a general intranet option with specific ECA capabilities. Other vendors support broad mobile ECA scenarios with focused intranet features. Some vendors handle ECA needs from other domains such as workforce management, well-being, cloud office or collaboration-related solutions.

User Recommendations

- Establish use cases; identify audience segments, channels, media and content types, campaign objectives, integration needs, application access and analytics by working with stakeholders focused on hybrid work, frontline workers and urgent/crisis communications.
- Assess technical requirements of ECA vendors and select them by including more subjective qualities, such as usability and employee experience. Sustain business value by leveraging employee feedback on ECA usage.
- Ensure operational readiness by taking advantage of ECA vendor consulting options including strategy, proof-of-concept (POC), training and establishing internal support. Execute pilots to assess impact and expand use. Address governance by defining content and administration frameworks to ensure consistency and quality.
- Connect efforts with ECA technology by making use of adjoining strategy areas such as digital workplace, intranet packaged solutions and emergency mass notification services.

Sample Vendors

Akumina; Beekeeper; Dynamic Signal; Facebook; Four Winds Interactive (FWI); Microsoft; SocialChorus, Staffbase

Gartner Recommended Reading

Market Guide for Employee Communications Applications

Toolkit: Employee Communications Applications Vendor and Product Data

Eight Steps for Modernizing Employee Communications in the Digital Workplace

Market Guide for Intranet Packaged Solutions

Employee Productivity Monitoring

Analysis By: Helen Poitevin, Rashmi Kotipalli

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition

Employee productivity monitoring technologies use automated data collection and analytics to report on employees' activities, time spent, work locations and work patterns. They contribute to measuring and improving workforce productivity, well-being and experience.

Why This Is Important

Client interest in employee productivity monitoring has increased substantially through the COVID-19 pandemic. It can provide insights into when employees are working, what work is being done and how much time is spent on different activities. Employees, managers, and HR and business leaders have had increased interest in this in order to gain visibility into work activities in remote work environments.

Business Impact

Used well, insights from employee productivity monitoring can support efforts to improve organizational effectiveness, employee experience, worker well-being and working-time compliance. Used poorly, monitoring tools can present substantial employer brand risk, high cost due to erosion of trust, and low employee engagement due to worker backlash and a toxic work culture. It's best suited for roles where a large number of employees have similar and relatively routine work tasks and activities.

Drivers

- The COVID-19 pandemic drove many organizations around the globe to operate with a significant portion of their workforce working remotely. This drove substantially higher interest in monitoring employee activities and analyzing work patterns. This is true especially for business leaders who felt they had lost control by not having workers physically present in offices. Prior to the pandemic, these technologies were not widely considered or adopted.
- Talent analytics teams and HR leaders have shown increased interest in analyzing data from outside of HR systems to understand worker behaviors. The intent, in general, is to increase worker well-being, identify burn-out rates or improve employee experience. In some cases, the intent is to control for working-time compliance, especially in jobs or roles that would be eligible for overtime pay.
- Some investments in employee productivity monitoring aim to improve how teams work by identifying workload imbalances within teams and focusing on workforce optimization. They may also seek to improve productivity through advice to leaders around how to communicate or how to better organize work.

Obstacles

- Many monitoring tools offer basic categorization of activities (including applications, browser URLs or other activities) as work and nonwork related, and thus offer limited value.
- Organizations must weigh the potential organizational and cultural cost of monitoring employees against the value of the data collected and insights generated. Employees can feel a lack of trust, or a sense that time and volume of activities matter more than outcomes or impact.
- Labor regulations in a number of countries will limit the ability to use these tools, or require negotiations with workers councils to put them in place.
- Public opinion around privacy, in addition to privacy regulations, means that investments in employee productivity monitoring must be done with great care. Reasons for monitoring must be clearly aligned with employees' performance development, as well as specific controls put in place to limit who has access to what insights generated from the data, and for what purpose.

User Recommendations

- Inform your investment decisions through careful inquiry about data sources, user experience design and what value you intend to get from the data collected.
- Ensure that the technology is being implemented ethically by testing it against a key set of human-centric design principles. Mitigate risks through a careful communication strategy. In the case of COVID-19 response, align messaging to the enterprise response to the pandemic.
- Use a checklist to ensure that the purpose and scope of data collection is in line with how it will be used and supports employees doing their best work.

Sample Vendors

ActiveOps; ActivTrak; enaible; Fin Analytics; Prodoscore; Sapience; Teramind; Time Doctor; WorkMeter; Workpuls

Gartner Recommended Reading

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

Microapps

Analysis By: Jason Wong

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

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 possibly across multiple apps or applications. The microapp must be tightly scoped and is composed of user interface (UI), logic and data components typically bound to back-end microservices through a mediated API layer. Microapps can be used as part of a micro-frontend architecture to compose a fit-for-purpose user experience (UX).

Why This Is Important

The term “microapp” is not new. But the architectural concepts of microapps as part of a mesh app and service architecture (MASA), and applied to multiexperience development (spanning web, mobile and conversational apps), are important to designing for composable business and achieving composable experiences. Microapps help scale front-end development because they are built and run as self-contained activities that may rely on common back-end services.

Business Impact

- Microapps deliver composable experiences, enabling more dynamic and contextual user engagement.
- They improve agility and reuse, with an ability to develop functionality independently by different developers.
- They promote consistent UX, especially across a multiexperience user journey.

Drivers

- Microapps have gained traction as part of mobile app development, but have yet to be more broadly embraced for multiexperience. However, there has been a steady increase in the use of micro-frontend application architecture that aligns with the use of microapps, such as creating a library of React-based modules or components. Microapps also support event-based scenarios to present interactions based on context, which aligns with event-driven architecture trends.
- In recent years, the total number of vendors using the term “microapp” to describe capabilities of their offerings has steadily increased. Enterprise software providers, such as SAP and Citrix, are also enabling and delivering microapps for greater configuration of a multiexperience UX.
- Some providers have started to create “super apps,” which are the runtime mechanism for distributing microapps from their ecosystem and developers. The WeChat and Alipay apps in China are examples of super apps that allow for third parties to create and deploy miniprograms within their apps. Enterprise collaboration and messaging platforms, such as Microsoft Teams and Slack, are taking cues from these consumer super apps to also enable third parties to create and distribute microapps within their main mobile or web apps.
- On the enterprise side, Tata Digital announced the creation of its own super app to bring all the Tata Group consumer businesses onto a single platform. This is an evolution of the apps economy, driven by digital business ecosystems. Microapps align with agile development practices and support the shift to smaller units of development work that can be delivered continuously. Organizations must align to agile and DevOps practices to effectively deliver microapps, and shift to cloud-centric development to streamline self-service development and DevOps processes. Security and governance is a concern when multiple microapps, from different providers, run in a larger application context.

Obstacles

- One main challenge is in designing for microapps. This requires understanding the user journey and breaking down interactions into microjourneys. This mature UX design approach allows for microapps to be used across mobile apps, as well as in web apps and supporting conversational apps, such as a card UI within a chatbot interaction.
- The development effort requires a high level of skills and coordination. Some organizations rely on specific client-side frameworks or proprietary platforms, such as low-code application platforms (LCAPs) or multiexperience development platforms (MXDPs), to implement an architecture supporting microapps. Using platforms and frameworks could lead to vendor lock-in risks; therefore, development teams must use appropriate isolation techniques to separate their code.

User Recommendations

Application and software engineering 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 MASA.
- Identify suitable development frameworks or technologies for microapp enablement and orchestration across your target touchpoints (e.g., web, mobile app, chatbots).
- Avoid functional conflicts by managing governance of the microapp runtime container's capabilities (such as permissions, user consent and location service).
- Learn and strengthen modern application development skills that improve architecture, development and delivery.

Gartner Recommended Reading

3 Key Practices to Enable Your Multiexperience Development Strategy

Essential Skills for Modern Application Development

One Versus Many — When to Consolidate Your Enterprise's Apps

Visual Collaboration Tools

Analysis By: Brent Stewart

Benefit Rating: Moderate

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition

Visual collaboration tools offer a set of features designed to enable collaborative creativity in a real-time, cloud-based workspace. Visual collaboration tools go way beyond the virtual whiteboard with feature sets and templates that allow users to facilitate live sessions, run planning sessions, generate ideas, evaluate concepts, and co-design.

Why This Is Important

Prior to COVID-19, visual collaboration tools were already gaining traction. Since the remote work imperative, they have become a key toolset for creative teams, including UX. Top vendors in the market have successfully handled their new status and the associated business and functional demands, revealing a level of maturity that is remarkable. Gartner expects visual collaboration tools market to expand and solidify a foundational role in the continuing global shift to remote work.

Business Impact

Visual collaboration tools further legitimize and support the case for remote work. In fact, it is possible visual collaboration tools elevate creativity in general due to the frameworks they provide for ideation, evaluation and participation (by multiple team members and/or customers).

Drivers

- **Shift to remote work:** Global shift to remote work makes visual collaboration tools the “new whiteboard.”
- **Design thinking and collaborative creativity:** The rise of design thinking and collaborative creativity in the form of workshops, design sprints, strategy sessions and more requires a shared workspace that enables shared ideation, evaluation and decision making.
- **Tools and templates:** Visual collaboration tools include templates for brand, business, marketing and product strategy methods and techniques that accelerate discovery, exploration and validation

Obstacles

- **Return to the office:** As the pandemic subsides, Gartner expects several companies will return to the office and/or implement hybrid working models. When teams can gather around a physical whiteboard, visual collaboration tools become less critical.
- **Digital product design platforms:** Collaboration and co-design features in digital product design platforms, specifically in Figma, are close to — or on par with — purpose-built visual collaboration tools.
- **Integrations:** Visual collaboration tools need to enable deeper integration with design, product management and development tools to become a permanent part of the digital product design toolset.

User Recommendations

Software engineering leaders interested in collaborative creativity should:

- Engage in a platform evaluation and selection process.
- Employ a visual collaboration tool as the de facto meeting tool for research, strategy and creative teams (potentially replacing Zoom, Teams or Webex).
- Plan and execute workshops and design sprints on the selected platform.
- Plan and execute user research methods and techniques that require real-time one-on-one facilitation.

Sample Vendors

Bluescape; Figma; Miro; MURAL

XLA

Analysis By: Daniel Barros, David Groombridge

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition

Experience-level agreements (XLAs) help drive better user experience by leveraging elements of digital experience monitoring (DEM), sentiment analysis, and traditional service-level metrics that monitor the timeliness and effectiveness of supporting processes. XLAs measure the end-to-end employee experience when consuming corporate IT services and focus on employee productivity and engagement.

Why This Is Important

Having the right XLAs allows organizations to attract digitally dextrous talent and ensure the optimal productivity of its workforce. While XLAs are possible in an internally staffed workplace delivery structure, they are mainly used in outsourced digital workplace services (ODWS) deals, where enterprises seek to transform employees' digital experience. Modern workplace technologies are often delivered by multiple parties and require coordination.

Business Impact

Traditional service desk and field service outsourcing has proved to be of low value for a digitally dexterous workforce that expects organizations to provide a workplace environment that is engaging and adapts to modern work-from-anywhere user needs. Often, employees stop using low-skilled service desks, giving the impression these services have low demand. Having XLAs that focus on providing a modern digital workplace for employees is critical to attracting and retaining talent.

Drivers

- XLAs aim to measure the end-to-end experiences of users in consuming the IT services necessary to perform their daily activities. 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 to business KPIs, allowing the creation of outsourced service deals that contract for defined business outcomes.

- 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 service engagement to bridge the gap between the intended business performance improvements and the services that will be delivered and measured through the XLA metrics.

- 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; endpoint performance; performance of the applications that are relevant to the specific intended experience objectives; time to access needed applications; and user sentiment.

Obstacles

- **Lack of awareness:** Many clients are unaware of the existence of new outsourced digital workplace services and put out prescriptive RFPs asking for value-deprived service desk and field service support.
- **XLA washing:** Some service providers have rebranded their traditional SLAs as XLAs, leaving out the end-to-end experience monitoring and business value focus.
- **Risk aversion:** Many clients seek to offset all business risk through their ODWS contracts with service providers. However, true business value, and the exact digital workplace solution that will provide it, requires co-development with the provider. The same applies to service providers that claim they will only monitor what they are directly responsible for delivering.
- **Unwillingness to change:** Some enterprises are unwilling to enter into the workplace transformation required to improve the user experience and maximize the value of XLAs.

User Recommendations

- Create XLAs that measure end-to-end user experience by including more than simple timeliness and technical metrics. The key element to a successful XLA is to implement monitoring that focuses on the employee experience and not on what the service provider or internal IT organization is responsible for delivering.
- Select outsourcing providers with a strong track record in process mapping, analytics and digital experience monitoring by prioritizing providers that have demonstrated referenceable business improvement from ongoing XLA delivery.
- Improve internal operations by identifying the leading causes of employee dissatisfaction with IT services and improving them with a series of XLAs.
- Link technical service delivery to business KPIs by adopting XLAs with their service providers to measure and drive the desired user experience.

Gartner Recommended Reading

Contract for User Experience When Outsourcing Managed Workplace Services

Observe, Measure and Assist: Three Emerging Ways to Drive Workforce Digital Dexterity

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

Market Guide for Digital Experience Monitoring

EXTech

Analysis By: Ron Hanscome

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition

Employee experience technologies (EXTech) are a diverse collection of employee-facing solutions designed to influence and improve employee experience and organizational culture. This spans worker interactions with HR, managers, teams and communities. Behavioral economics and positive psychology principles often underpin solution design to maximize worker engagement and encourage mindsets that align with organizational culture, values and objectives.

Why This Is Important

Leading enterprises have realized that employee engagement and retention are primarily downstream results of an optimized employee experience (EX). Emerging disciplines such as neuroscience, behavioral economics and positive psychology have taught us much about motivating individuals.The need to enable these principles via technology while effectively supporting pandemic-related return-to-work scenarios (including “forever hybrid” for many) has driven much greater interest in EXTech in 2021.

Business Impact

Worker motivation and engagement are key in work environments that demand ever-increasing levels of innovation, creativity and collaboration across teams. EXTech solutions can help to increase employee motivation and engagement, thus contributing to business performance and outcomes while supporting a 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.

Drivers

There are three primary EXTech solution types in the market:

- "Overlay" solutions that streamline and/or orchestrate the digital aspect of EX in a fragmented app landscape. These come from new work hub providers, HR service management solutions, HCM suites, horizontal bot/workflow providers, modern intranet vendors and microapp providers.
- Solutions delivering a wide set of digital experiences to a specific worker type (such as knowledge or frontline workers), or even a worker type within an industry (such as frontline retail, call center).
- Products that digitize emerging EX aspects and interventions, such as leadership actions, well-being, social responsibility and inclusion.

These solution types will intersect with the following to drive selection over the next 2-3 years:

- Attracting and retaining staff for regions and industries fighting the next "war for talent." Although it began in 2019, the uneven impact of the pandemic has caused this driver to intensify for many enterprises, while subsiding for others.
- Supporting a more agile organization and increasingly fluid future of work, including the splitting of jobs or roles into groupings of tasks requiring similar skill sets.
- Improving EX within the context of remote or hybrid environments by rendering HR processes and tasks within a pervasive new work hub.
- Enhancing employee-facing processes such as performance feedback, coaching, encouragement, learning, competition, participation and recognition.
- Incorporating EX techniques such as gamification, recommendations, nudges, mindfulness and well-being to increase adoption, engagement and performance.

- Increasing the connection of employees to others and to common purposes.
- Unifying EX for a portfolio of HCM solutions with divergent UX, architectures and data models.
- Integrating with (or augmenting) continuous listening solutions to enable consistent employee feedback, including specifics on work-related factors such as schedule quality, best practices and working conditions.

Obstacles

- There is currently no comprehensive EX "platform" that meets the needs of all worker types and work patterns in the major industries across all employee size segments and geographies. Despite robust development (and marketing) efforts by many providers, one is not likely to emerge in the next five years, so enterprises will usually deploy multiple EX solutions to meet their requirements.
- EX usually has multiple stakeholders, with HR, corporate communications, digital workplace leaders and operations all wanting to drive (or at least influence) solution design and deployment. This can cause difficulties in gaining consensus on the issues and outcomes.
- The market has become increasingly crowded, with digital workplace, cloud HCM suite, HR service management, frontline communications, modern intranet and specialist vendors all positioning their offerings as "employee experience platforms." This has increased market confusion in terms of which solution is best fit for a given use case.

User Recommendations

- Assess each solution's philosophy and design approach to determine its cultural and contextual fit, using Gartner's digital workplace framework to identify its relationship to existing work "hubs." Also evaluate your incumbent cloud HCM suite, as most are also investing in EXTech.
- Realize that success of EXTech is more reliant on an employee-centric culture and mindset than technology. Any solution, even one that applies the latest techniques, won't be able to overcome cultural resistance.
- Consider agile pilots, as EXTech solutions are emerging, features vary and relative impact differs across worker types and industries. Focus on employee value-add and time to benefit.
- Use leading design practices such as personas and employee journey mapping to ensure that the delivered solution actually improves interaction quality.
- Consider EXTech tools for both shorter-term hybrid work environment needs and longer-term requirements to cultivate a deeper relationship between organization and employee.

Sample Vendors

Akumina; Centrical; Humu; InFlight; LeenaAI; Limeade; Microsoft (Viva); ServiceNow; WeSpire; WorkJam

Gartner Recommended Reading

Deliver on Employee Experience in the New Workplace When HCM Technology Replacement Isn't an Option

Market Guide for Voice of the Employee Solutions

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

Quick Answer: What Is Microsoft Viva?

Bring Your Own Thing

Analysis By: Nick Jones

Benefit Rating: Moderate

Market Penetration: Less than 1% of target audience

Maturity: Emerging

Definition

Bring your own thing (BYOT) refers to individuals using personal smart devices at work, because they provide benefits in convenience, fashion or productivity. BYOT will involve a wide range of smart objects, such as wearables, smart lights, air filters, voice assistants, earbuds, remote-controlled power sockets, consumer virtual reality (VR) headsets, drones or coffee machines. In the longer term, BYOT will include highly sophisticated devices, such as autonomous vehicles and domestic robots.

Why This Is Important

BYOT is the next step in consumerization, which has been driving consumer technology into the workplace for decades. As consumers acquire more sophisticated personal IoT, a growing range of “things” will be brought into offices or be used to support remote working. They’ll provide new and more convenient ways to perform tasks or will improve the quality of the working environment; however, diverse, intelligent, networked BYOT devices will also pose privacy and security challenges.

Business Impact

The early business impact of BYOT both in office- and home-working situations will be to improve convenience and quality of life, e.g., using smart lights, beverage makers, smart earbuds, or virtual assistants and personal healthcare devices. In the longer term, it is likely that some workers will find new ways to use advanced smart devices to assist them, e.g., using domestic robots or indoor drones to fetch and carry items, or VR devices or smart contact lenses to support some tasks.

Drivers

- The early drivers for BYOT will be convenience and ease of use. For example, using technologies like smart assistants to provide simple control of devices such as desk lights or beverage makers. Workers will also use personal accessories such as fitness bands to monitor working behavior and use smart earbuds for calls and to control equipment.
- BYOT will grow slowly over a period of a decade as homes and domestic technology become smarter, and consumers acquire a wider range of personal smart devices. One of the long-term legacies of COVID-19 is likely to be a reduction in office-based work, which will accelerate BYOT in the home-working environment.
- In the longer term, some workers will discover new ways to use smart devices to improve their performance at tasks, or to automate processes in new ways. For example, using domestic robots, consumer VR devices, earbuds for hands-free tasks, or assistive devices that improve their senses such as smart contact lenses.

Obstacles

- Many personal smart devices will be networked and will contain sensors, cameras and audio capabilities, so will pose a wide range of security and privacy concerns.
- Many personal BYOT devices will exploit cloud services, and could transmit information to unacceptable organisations or locations.
- In the longer term, personal devices such as drones and robots could cause physical risks.
- Infrastructure and operations staff will resist connecting uncontrolled personal devices to corporate Wi-Fi.
- Enterprise security tools and policies are unsuited to managing or monitoring the diverse range of personal smart devices.
- BYOT may create new digital divides inside the organization depending on the employee's ability to afford new types of devices.

User Recommendations

IT executives and staff responsible for cybersecurity should:

- Look for ways in which consumer IoT devices could improve productivity, effectiveness or working conditions. Monitor on-premises BYOT to identify opportunities.
- Create policies and guidelines that extend to personal BYOT and educate employees.
- Establish a separate controlled Wi-Fi zone for BYOT.
- Deploy security tools such as network monitoring and CASB which can indicate where some types of BYOT are occurring, and monitor the behavior of certain devices.
- Discuss BYOT with your device management and security vendors to understand their roadmaps in this area.
- Monitor how BYOT devices are used in home-working situations, they could pose risks or provide opportunities outside the office.

Sample Vendors

Amazon; Apple; Blue Frog Solutions; D-Link; Google; iRobot; Panasonic; Samsung Electronics; Signify

Gartner Recommended Reading

Forecast Analysis: Wearable Electronic Devices, Worldwide

Alexa for Business: B2B/B2E Disruptor ProfileUse Sensors and Multimodal Interactions to Differentiate UX in Connected Home SolutionsForecast: Wearable Electronic Devices, Worldwide, 2018Technology Investments for Frontline Workers Will Drive Real Business Benefits

Knowledge Graphs

Analysis By: Afraz Jaffri

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition

Knowledge graphs are data structures, representing knowledge of the real world including entities (people, companies, digital assets, etc.) and their relationships, which adheres to a graph data model — a network of nodes (vertices) and links (edges/arcs). The knowledge within the graph can be explicitly stated or implicitly inferred using rules that are defined in an ontology for classes of entities and relationships. Further knowledge can be derived using graph analytics and machine learning.

Why This Is Important

Knowledge graphs capture information about the world in an intuitive way that is often easier to understand, manipulate and use than other types of data models. Google, Facebook, Amazon and other tech companies use graphs as the backbone of a number of products and services due to their ability to encode and interrelate disparate data at source. They support collaboration and sharing, search and discovery, and the extraction of insights through analysis.

Business Impact

Knowledge graphs can drive business impact in a variety of different settings including:

- Digital workplace (e.g., collaboration, sharing and insight).
- Automation (e.g., ingestion of data from content to RPA).
- Machine learning (e.g., augmenting training data).
- Investigative analysis (e.g., law enforcement, cybersecurity or financial transactions).
- Digital commerce (e.g., product information management and recommendations).
- Data management (e.g., metadata management, data cataloging and data fabric).

Drivers

- Ongoing digitization and globalization initiatives lead to growing levels of complexity and dynamics, creating a need for more adaptive and integral approaches, as offered by knowledge graphs, replacing more static and siloed approaches.
- Increasing awareness of the use of knowledge graphs in consumer products and services such as smart devices and voice assistants, chatbots, search engines, recommendation engines and route planning.
- Improvements in graph DBMS technology that can handle the storage and manipulation of graph data structures at scale. This includes PaaS offerings that take away the complexity of provisioning and optimizing hardware and infrastructure.
- Knowledge graph platform providers are entering the market that provide a suite of tools for creating, managing and using knowledge graphs. Low/no-code tools are developing and expanding the use of knowledge graphs to business and nontechnical users.
- The desire to make better use of unstructured data held in documents, images and videos using standardized metadata that can be related and managed.
- The need to manage the increasing number of data silos where data is often duplicated and usage and consumption cannot be controlled.
- The increasing use of graph algorithms and machine learning to identify influencers, customer segments, suspicious activity and critical bottlenecks in complex networks.
- Service providers are specializing in knowledge graph implementation and building offerings based on the technology.

Obstacles

- Awareness of knowledge graph use cases are increasing but business value is difficult to capture in the early stages of implementation making them low priority initiatives.
- Moving knowledge graph models from prototypes to production requires engineering and system integration expertise. Methods to maintain knowledge graphs as their size increases to ensure reliable performance and handle duplication and data quality remain immature.
- Fragmentation of the graph DBMS market across the types of knowledge graph data models (RDF or property), implementation architectures (native or multimodal) and differences in optimal workloads (operational or analytical) continue to cause confusion and hesitancy among adopters.
- Key to the long-term success of knowledge graphs is enabling data within organizations to be interoperable with external knowledge graphs to enable the ingestion, validation and sharing of ontologies and data relating to entities e.g., geography, people, events, etc.

User Recommendations

- Identify use cases where there is a need for custom-made knowledge graphs through the use of a pilot project that delivers tangible value for the business, but also learning and development for data and analytics staff.
- Take an agile approach to knowledge graph development to decrease time to value. Assess the data that is needed to feed a knowledge graph, both structured and unstructured, creating a minimum viable subset that can be used to capture the information of a business domain.
- Utilize vendor and service provider expertise to validate use cases, educate stakeholders and provide an initial knowledge graph implementation.
- Include knowledge graphs within the scope of 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.

Sample Vendors

Cambridge Semantics; Diffbot; eccenca; Ontotext; Semantic Web Company; TopQuadrant

Gartner Recommended Reading

How to Build Knowledge Graphs That Enable AI-Driven Enterprise Applications

Top Trends in Data and Analytics for 2021: Graph Relates Everything

Graph Steps Onto the Main Stage of Data and Analytics: A Gartner Trend Insight Report

Working With Graph Data Stores

Financial Data Strategy and Knowledge Graphs

Agile Beyond IT

Analysis By: Lorri Callahan

Benefit Rating: Transformational

Market Penetration: 20% to 50% of target audience

Maturity: Adolescent

Definition

Agile is a discipline that will help shorten the time it takes to accomplish strategic goals. This discipline focuses on improved investment decision making, iterative and adaptive practices, frequent customer interactions and increased team effectiveness. With more technology decisions driven outside of IT to enable digital business transformation, it is necessary for organizations to become more agile in how they approach all types of work. Agile is not just about IT anymore.

Why This Is Important

The benefits gained from IT's adoption of agile practices have created interest and momentum in extending these practices throughout the organization. The need to improve business performance holistically has opened the doors to adopting new ways of working in HR, audit, marketing, finance and other functions. Every function needs to be conversant in agile terminology and understand how their own processes need to change in order to effectively work with groups that have adopted agile.

Business Impact

PPM leaders can support the adoption of agile because of their visibility into planned work and its alignment to strategic imperatives. When adopted and rigorously applied, the mindset can enable the enterprise to move faster and to be more focused on ensuring outcomes that deliver value. This means further integration of business and IT teams, moving from a “me” to “we” culture. New ways of doing business boost performance through group accountability for business results.

Drivers

Key agile adoption trends that support the extension of agile beyond IT include:

- Organizations continue to turn to new ways of working, like agile, to keep pace with the rate of disruption and change in the marketplace that requires: (1) finding the balance between being adaptive and innovative; (2) removing wasted motion; and (3) creating greater clarity and focused commitment to the desired outcome.
- Agile, steeped in long-standing lean practices, is recognized as a means to create efficiency and make iterative adjustments for higher quality results.
- Business-led IT analysis and investment continue to increase.
- Recognition of the criticality of multidisciplinary (fusion) teams to drive digital transformation success.
- Interest in adoption of enterprise agile frameworks continues to increase.

Obstacles

- Organizations do not realize the adoption of agile takes discipline, knowledge and practice.
- Existing processes and behaviors are often not suitable for operating in an agile way of working.
- Prioritization practices do not have adequate criteria to ensure work requests are aligned to strategic imperatives, contain defined business outcomes, and articulate the KPIs that will be used to ensure both.
- Infrequent portfolio reviews do not enable the ability to closely monitor proposed, planned and in-progress work to continually reassess performance and replan accordingly.

User Recommendations

Agile is an approach to achieving customer-centered collaborative results under conditions of uncertainty, and is not limited to IT and software development. Begin by providing general overviews to help orient everyone to the concepts and practices needed to adopt agile. Next, identify a pilot team of dedicated resources to address a specific scope of work with these considerations:

- Limit the amount of interdependencies and complexity.
- Enable the pilot team to commit to the shortest possible deadline required to achieve a viable outcome, without burning out people and without disrupting day-to-day operations.
- Publicize the progress of the pilot team and the shift in their behaviors as they implement agile practices.
- Create opportunities for others to learn about the pilot through demos and pilot team metrics.
- Extend the lessons learned from the pilot to additional areas, playing forward the successes and lessons learned from each subsequent group to the next.

Gartner Recommended Reading

Adopting Agile in Audit

The Agile HR Function

An Introduction to Agile Marketing Utilization

Expand Your Process Improvement Toolkit to Include Agile

Smart Workspaces

Analysis By: Gavin Tay, Rashmi Kotipalli, Annette Jump

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition

A smart workspace exploits the growing digitalization of physical objects enabled 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 devices, software applications, enterprise social graphs and artificial intelligence (AI) to improve workforce efficiency and effectiveness.

Why This Is Important

Remote working instituted by COVID-19 has diversified smart workspaces. Home spaces now support employee productivity, safety and cultural perception of the workplace. Employee experience improvement is a priority so that employees make better use of smart workspaces for hybrid work. Traditional office models that were pandemic-struck and underutilized are being phased out. Utilization data of these changes is leading to smart workspaces focused on well-being and safety while reducing cost.

Business Impact

Smart workspaces have been forever reshaped into multilocation workspaces. The digitalization and programmability of these multilocation workplaces is creating new integration opportunities. IT methodologies related to system design are requiring new skills for design teams to understand how people use places and things. Smart workspaces are also having an organizational impact as IT teams now need to work with facilities management teams in ways not previously envisioned.

Drivers

- Digital workplace strategies that focus on facilities modernization, more agile/hybrid work environments and the value of employee experience continue to shape interest in smart workspace technologies. We see synergies between 10 trends: the IoT; AI-related technologies; AR/VR/MR; digital signage and electronic whiteboards; indoor mapping; smart buildings, including trends in integrated workplace management systems (IWMSs); IWMS platforms (as they move into IoT-based services); remote working/collaboration and virtual workspaces; occupancy and motion sensors; wearables; and facial recognition/natural language processing (NLP).

- 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; ome spaces (due to remote working instituted by COVID-19); co-working spaces to support agile/hybrid work; office and desk spaces; conference and huddle rooms; smart meeting rooms; retail and shop floors; and manufacturing assembly lines.

- "Things" participate in a smart workspace. Examples include building interfaces (HVAC), large digital displays, smart badges, workstations, mobile devices and wearables.

- Electronic whiteboards are becoming integrated with traditional collaboration and content software systems to address a hybrid workforce. 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 postpandemic, contactless authentication using facial recognition and QR code scanning has become the norm.

Obstacles

- Smart workspaces are emerging at an uneven pace as organizations prioritize potential solutions independent of one another. For instance, building upgrades may take longer than expected, and some market sectors will lag in terms of smart workspace adoption. Localization needs will also influence smart workspace adoption.
- Adoption rates will vary based on organizations' requirements to support flexible hybrid work models that optimize the physical and interactive aspects of places and things (as well as employees' privacy concerns).
- As workers return to work postpandemic, we should expect organizations to take full advantage of a smart workspace. It requires organizations' expertise to reimagine and redesign strategies to include methods for gaining a better understanding of how people participate in physical spaces or adhere to social distancing. Such insight, which is scarce, can create new capabilities related to seating and room allocation, access management, and wayfaring.

User Recommendations

- Focus digital workplace strategies and digitalized business processes toward smart workspace trends. Seek deployment opportunities that include hybrid offices, co-working spaces and in-building open spaces.
- Expand beyond traditional productivity scenarios, with emerging applications that are more industry- and process-specific. Examples derived from COVID-19 include insurance professionals using a remote digital pen that interacts with back-end processing systems, and patients being remotely monitored via a wearable that interfaces with diagnostic systems to update healthcare professionals.
- Foster close partnerships between IT, and real estate, facilities and HR teams. Identity and access management (IAM), privacy and security teams play a critical role in supporting contact-tracing requirements. Anonymizing data is key to safeguard privacy expectations and promote adoption of new services while delivering employee experience.

Sample Vendors

AgilQuest; Condeco; Estimote; Eutech; Microsoft; Oblong; Planon; PRYSM Group; Spacewell; Trimble

Gartner Recommended Reading

Emerging Technology Analysis: Smart Spaces

Emerging Technologies: Smart Robots Will Augment Human Workers, Not Replace Them

Market Insight: Choose the Right Technology to Dynamically Track People Within a Smart Space

Transform Ghost Offices Into 24/7 Wellness-Monitored Co-working Offices and Capitalize on Tax Relief

Workplace Analytics

Analysis By: Dan Wilson, Stuart Downes

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Adolescent

Definition

Aggregated insights derived from technology performance data and organizational context are used to improve technology performance and adoption as well as influence employee experience, collaboration and productivity. Data is commonly collected through agents, sensors, graphs or APIs.

Why This Is Important

While many organizations are making significant investments in digital workplace and digital transformation initiatives, most are not collecting data on or are unable to effectively measure the impact of their efforts. Without data and analytics, digital workplace leaders are unable to justify additional investments required to scale new technology. This is especially important given the financial pressure that organizations are under and increased demands to improve employee experience.

Business Impact

Workplace analytics (WPA) provide digital workplace leaders visibility into the impact on digital and organizational change management, including:

- Transparency into technology performance and usage.
- Application of organizational context data.
- Derived insights, which help uncover ways to drive adoption and enhance experience, identify productivity inhibitors, and help improve technology and business alignment.
- The ability to feed data into or include nudge engines to reinforce best practices.

Drivers

- Overall employee experience is now heavily influenced by the technology experience as the majority of interactions with peers, vendors and customers are exclusively through technology. IT leaders are looking for data to baseline and measure the progress of improving the stability, availability and performance of the devices and systems they deliver, especially as changes are made.
- Digital transformation requires visibility into what technology employees depend on, and how well they can use technology to improve work and improve productivity.
- The increased threat of cyberattacks requires IT and security teams to understand what devices and technology are being used and from where they are being used so appropriate measures can be implemented to reduce risk. This includes use of unmanaged devices (BYOD or BYOPC) or public conferencing technology to conduct internal or confidential classified business.
- Remote work has limited a leader's ability to see and adjust collaborative behaviors and patterns, as they could in the office. The patterns themselves have also changed to be less timebound, requiring leaders to adjust accordingly.
- Organizations are also looking for data to inform the return to the office as a collaboration hub by prioritizing those that are struggling with remote work and for insights into potential employee engagement and wellness issues.
- WIth all of this data and advanced analytics, organizations can also look to identify and promote best practices.

Obstacles

- The inability of IT, HR and business leaders to agree on requirements and use cases.
- The tendency to use dashboards before defining the questions leaders seek to answer.
- Union workers or legal/regulatory limitations on data collection due to privacy concerns within some organizations.
- The threat that leaders with trust issues may misuse data for employee surveillance.
- The failure of change-averse teams to adopt processes focused on delivering change based on analytics-derived insights that, instead, continue to use historic precedence.
- The cost of several tools or capabilities to aggregate data and insights from other digital workplace technology management tools.
- Paying too much attention to experience scores and benchmarking inside analytics tools, which can misclassify efforts due to algorithms lacking context or sophistication.
- A delta between what organizations want from WPA and what can actually be done with the data collected.

User Recommendations

Hype has passed the Peak of Inflated Expectations as more organizations are using WPA, but some are struggling with the need to use multiple tools or aggregate several data sources to maximize value. Gartner recommends:

- Consolidate requirements and align collective goals to corporate objectives by collaborating with shared services and line of business peers.
- Ensure policy and legal compliance by partnering with HR and Legal.
- Avoid tool sprawl by reviewing existing capabilities or potential upgrades before buying new.
- Minimize risk by training managers on appropriate use before granting access and ensuring that employees understand the intent and use of WPA.

- Avoid irrelevant comparisons to other companies by using tool-provided experience scores to baseline and measure your own progress.

Sample Vendors

ActivTrak; Avanade; Humanyze; Microsoft; Sapience; Scalable Software; Worklytics

Gartner Recommended Reading

Enhance Digital Workplace Operations With Machine Learning and Automation

Adapt the IT Operating Model to Deliver Indispensable Digital Workplace Services

Top Strategic Technology Trends for 2021: Anywhere Operations

Optimize End-User Services Through Segmentation of Work Settings

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

Collaborative Work Management

Analysis By: Nikos Drakos

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition

Collaborative work management (CWM) tools provide task-driven workspaces that support business users in work planning and execution. They combine task, project, workflow and automation capabilities with conversations, content publishing, reporting, analytics and dashboards.

Why This Is Important

CWM blends work modeling and planning with management oversight and work execution. CWM fills a gap between free-form collaboration and business or custom applications by supporting emergent structure and coordination, such as in organizing a marketing campaign coordination or in planning an event. CWM technology supports work that can be planned top down, as far as it is possible to plan it, while enabling flexible, self-organizing execution and collaboration.

Business Impact

- Improve activity coordination in a flexible and agile manner
- Empower business users with sophisticated but easy-to-use tools for planning, execution, coordination, optimization and, increasingly, automation of day-to-day work
- Transparency for oversight, as well as the ability to define and fix guardrails that represent constraints on outcomes, timelines, budgets or resources
- Real-time visibility into execution with status roll-ups, dashboards and notifications depending on role or interest

Drivers

- Remote and hybrid work: Rise in interest in CWM, consistent with the recent increase in remote and hybrid work. In-person meetings and conversational channels that lack focus and context and are not enough to provide clarity and alignment — for example by modeling objectives and key results in a flexible and dynamic way. CWM tools are a natural complement to workstream collaboration and/or meeting solutions.

- Supply-side investments: There is notable investment activity and early signs of market consolidation on the supply side. In 2020 we had the Asana IPO as well as the acquisitions of Workfront and Wrike by Adobe and Citrix, respectively. But there is also no shortage of new vendors entering the market (we are aware of at least 80 vendors in the CWM market).

- Interest from vendors in adjacent markets: Vendors are entering this market from multiple adjacent markets (including project management, workstream collaboration, cloud office suites, employee communications, and business applications) contributing to the diversity and heterogeneity of the available products. They are recognizing an opportunity to position their products as solutions that appeal to a much broader user base.

- Demand generation tactics: Vendors are trying to attract business buyers with prebuilt work templates and/or generate demand directly by targeting end users with free/freemium products. One consequence of this use-case-specific vendor push is that many organizations end up purchasing more than one product, each narrowly deployed in a narrow business domain.

- Rising customer demand for a variety of work use cases: Buyers are recognizing the relevance of CWM to work scenarios that are collaborative by nature.But, they also require activity coordination in a context that may not justify purchasing or building specific solutions for everyday or ad hoc projects, case management, service management, product management, work scheduling, etc.

Obstacles

- Vendor and product risk: Most of the vendors in this market are small, in a market that is changing rapidly and where large platform vendors have yet to play their hand. This means buyers face a higher vendor and product risk than in more mature markets.
- No enterprise role for steering large scale deployments successfully: CWM solutions are introduced into many organizations by end users or via small departmental deployments. Most organizations using CWM solutions are introduced tactically without a coherent plan of what it would mean to operate them at scale.
- Lack of experience on governance at scale: When business users are effectively building applications for modeling work, it has implications for roles and responsibilities, quality control, release management and support.
- Culture attitudes and skills readiness: Not everyone will be comfortable or willing to work transparently or welcome more autonomy. Also, some may not have the digital skills to use the technology effectively.

User Recommendations

- Identify business context: Establish specific work management use cases and identify participants, activities and context by working together with relevant business stakeholders to ensure business alignment.
- Address governance issues: Address inevitable governance questions by determining access rights to work management capabilities to ensure consistency, quality and reuse.
- Start small and iterate: Test product and vendor readiness by starting with small, targeted deployments, making sure that use-case-specific issues and vendor readiness are addressed. Focus early deployments on situations where working transparently and collaboratively is already the norm to minimize the challenges from culture and behavior attitudes. As usage grows, rationalize technology choices, including interoperability with existing technology. Establish roles, support structures and governance principles to ensure consistency, quality, and best practice diffusion.

Sample Vendors

Adobe; Asana; Atlassian; Citrix; monday.com; Smartsheet

Gartner Recommended Reading

Market Guide for Collaborative Work Management

Toolkit: Collaborative Work Management Vendor and Product Data

Quick Answer: Which Technologies Can Support an Objectives and Key Results Program?

Market Guide for Marketing Work Management Platforms

Smart Badges

Analysis By: Tracy Tsai

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Adolescent

Definition

Smart badges are miniaturized integrated circuit cards in a device form factor that have built-in sensors and the ability to transmit data wirelessly. Sensor examples are infrared sensors, accelerometers, microphones and scanners. Unlike access management smart cards or smart IDs, smart badges are devices that provide advanced features, such as location-based contextual services and analytics, to improve workplace communication, operational efficiency, and employee well-being and performance.

Why This Is Important

Smart badges are increasingly important, especially for frontline workers' safety and health during the pandemic. Examples include contactless operation for workplace access and employees' location tracking for social distancing. Enterprises are seeking innovative technologies in the digital workplace to improve frontline workers' engagement and performance. Smart badges, other than employees' identities, can serve multiple functions to support enterprises' goals.

Business Impact

Smart badges bring high benefits for IT leaders to improve the digital workplace, such as:

- Increase workers' operation efficiency for hands-free identification verification and access authentication — for example, POS or equipment operations.
- Monitor workers' social distance during COVID-19 for employees' safety.
- Augment business with real-time context about the workers and surrounding environment, such as location-based data.
- Improve workers' experiences in the workplace and productivity.

Drivers

Smart badges worn by employees in the workplace have become an important information point about employees and their surrounding environment. Below are the major drivers to move smart badges from the Peak of Inflated Expectations to the Trough of Disillusionment:

- Enterprises' demand to improve the digital workplace for better user experience, such as quick and hands-free identification verification, access authentication, product codes scanning, information checking and task status reporting. Examples include contactless operation for retail POS systems to identify workers who are in close proximity or security authentication for single sign-on within organizations for access control.
- Emergency management by tracking and alerting the nearest available staff on where to go when urgent help is needed.
- Keeping employees' safe, such as. keeping social distances, providing contactless operation to reduce employees' infection during COVID-19, monitoring the fall sensors to detect workers' operational safety, avoiding a collision in forklifts or providing panic buttons.
- Event management to support attendees with personalized experiences and services, such as event schedule and notification. With E Ink's technologies, smart badges for event visitors can be repeatedly used with customizable context on the smart badge's display.
- Maturity of the technology solutions, such as electronic ink, RFID, NFC and sensors, enable smart badges to provide benefits, including customizable context, easy-to-see large displays, mobile payment, or added safety and security functions.

Obstacles

Despite all the benefits and drivers of smart badges in digital workplaces, it will still take two to five years for smart badges to reach the Plateau of Productivity. Here are the major obstacles:

- Employees' privacy is a concern. The smart badges constantly collect information about frontline workers' status, raising the concerns about the intrusion of privacy, potentially reducing workers' morale or and creating resistance toward smart badges.
- Complexity of integrating multiple technologies is a challenge for IT leaders based on different use cases and requirements. There is no "one size fits all" solution in the market.
- Fragmented technology solutions, such as wireless connectivity, sensors, electronic ink, audio, display, form factors and software applications, vary in maturity level.
- Strong justification for investment is needed due to the time and resources required to identify the business cases and conduct a proof of concept (POC) for each application.

User Recommendations

- Work with line of business (LOB) leaders to identify which of their issues and objectives can be assisted by apps for smart badges.
- Clearly explain how employee privacy is protected when implementing smart badges. Enterprises need to let frontline workers understand in advance what's being tracked and analyzed.
- Partner with technology providers to jointly develop the POC that supports not only the applications, but also helps technology providers build their understanding of the business domain.

Sample Vendors

Boni Global; E Ink; Group Dynamics; HID Global; Humanyze; Microchip Technology; PwC; rf IDEAS; SoloProtect; Zebra

Gartner Recommended Reading

Manage Social Distancing and Contact Tracing With Location-Aware Technologies and Devices

Hype Cycle for Frontline Worker Technologies, 2020

Magic Quadrant for Indoor Location Services, Global

Workstream Collaboration

Analysis By: Mike Gotta

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition

Workstream collaboration (WSC) tools create a persistent chat-based workspace divided into channels. Tools integrate direct and group messaging, along with meeting capabilities, file sharing, alerts, activity streams, tasks, bots, search and other plug-ins. They also come with APIs for customized applications.

Why This Is Important

WSC tools improve aspects of teamwork, especially intrateam messaging. They combine support for channel-based chat, information sharing, task coordination and meetings in order to act as team activity hubs. They help coordinate work, regardless of where team members are located — a key feature for hybrid working. Although still not popular among frontline workers, WSC tools will increasingly impact operational work and external collaboration.

Business Impact

WSC tools help team communication, information sharing, task coordination and management of the overall work process by acting as new work hubs. They also act as governance points for security and compliance, helping to safeguard organizational communications and content.

Business use cases include project management, service and support, sales, marketing and operational scenarios.

WSC tools also help maintain continuity as hybrid teams split their time between remote and on-premises working.

Drivers

- The shift to hybrid working models makes WSC tools essential to satisfy communication, information-sharing and task coordination needs, and creates synergies with collaborative work management tools. It also supports work governance, security and compliance, sometimes via third-party add-ons.
- COVID-19 has prompted a significant increase in the number of remote workers, who need a common work hub to support individual and team productivity in lieu of in-office interactions.
- Online meetings with audio and video support are a fundamental requirement for organizations, and this has resulted in tremendous reliance on WSC tools for everyday productivity.
- Many WSC tools natively support, or are easily integrated with, content services to provide workgroup management of files, which also aids remote working.
- Additional integration capabilities of WSC tools enable plug-ins for other needs, such as tasks, meetings and intranet services. They also enable developers to create more custom extensions.

Obstacles

- Although Microsoft and Google offer native WSC tools, not all business scenarios can be accommodated by everyday productivity suites. This can prompt organizations to adopt multiple WSC tools, which increases costs and complicates IT management.
- WSC vendors are not collaborating on message interoperability. Use of multiple tools to ensure workers can communicate creates “chat silos” and can lead to “tool sprawl.” Although third-party vendors use public APIs to exchange messages between tools, risks arise if these vendors lack contractual relationships with WSC tool vendors.
- Frontline workers have not adopted WSC tools to the same extent as office workers. WSC tool vendors need to better address the distinct needs of frontline workers and adjust their offerings.

User Recommendations

- Assume everyday productivity needs can be satisfied by the incumbent productivity suite vendor (Microsoft or Google) when evaluating WSC tools. Remain open to adding WSC tools for process-driven and operational-role-based work when assessing business use cases that are not productivity-centric. Consider frontline workers' needs as being "stretch goals" for many WSC tool vendors.
- Prioritize a strong focus on employee communications, a champion program, analytics, training and promotion of best practices based on successful use of WSC tools by staff, in order to reinforce new ways of working.
- Onboard new team members using WSC solutions and establish the right usage behaviors early.
- Reduce "noise" and fatigue by educating staff about chat etiquette and communicating best practices for using WSC tool features by, for example, showing them how to fine-tune alerts and notifications.

Sample Vendors

Cisco; Coolfire; Google; Mattermost; Microsoft; Rocket.Chat; Salesforce (Slack)

Gartner Recommended Reading

Market Guide for Workstream Collaboration

Forecast Analysis: Workstream Collaboration, Worldwide

Forecast Analysis: Social and Collaboration Software in the Workplace, Worldwide

Sliding into the Trough

Citizen Data Science

Analysis By: Carlie Idoine, Shubhangi Vashisth, Rita Sallam

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition

Citizen data science is a set of capabilities and practices that allow users to extract advanced analytic insights from data without the need for extensive data science expertise. This provides responsive insights and faster time to insight for driving business decisions.

Why This Is Important

Innovations in augmented analytics tools enable those without expert data science knowledge and experience to be productive in applying data science and machine learning (DSML) methods within their analyses. Citizen data science helps unlock new insights beyond use of basic descriptive and diagnostic capabilities, enabling democratization of analytics capabilities as well as an upskilling path and new opportunities for business analysts and developers.

Business Impact

Citizen data science forms the foundation of next-generation analytics and can be leveraged to:

- Make insights from DSML more accessible and pervasive.
- Narrow the DSML talent gap due to the shortage and high cost of data scientists.
- Bring extensive domain expertise and increase efficiency of expert data scientists.
- Perform specific phases of the analytics life cycle (such as feature generation and selection, and algorithm selection) to scale and focus use of expertise where needed.

Drivers

- Historically, building DSML models required expert data scientists who are difficult and expensive to hire and retain. Citizen data science helps overcome such limitations.
- Central to citizen data science is the availability of augmented analytics capabilities. These include automated, streamlined data access and data engineering; augmented user insight through automated data visualization and exploration; modeling and pattern detection including feature engineering, model selection and validation; automated deployment and operationalization; and capabilities to support collaboration and sharing.
- Citizen data science will be a key driver of analytics adoption for the foreseeable future. Many business users want to upskill their analytics knowledge and expertise and may already be doing so. This population has become so prevalent that tools and features have been designed specifically for their use.

Obstacles

- Upskilling in advanced DSML techniques and approaches is important to derive value from citizen data science. Classroom learning provides a foundation but must be supported by on-the-job learning and experimentation.
- Tools with augmented analytics capabilities and additional processes to manage creation and sharing of models will be required to support citizen data science.
- There is still a need to (statistically) validate results of citizen data science by expert data scientists.
- Expert data scientists often resist or underestimate the effectiveness of citizen data science approaches.
- Citizen data science is often deemed to be just a preliminary, elementary step and not a fully functional DSML approach.
- Citizen data science leveraged in silos with no oversight or collaboration among experts and others with a vested interest in DSML success could lead to duplication of data engineering and analytic effort, lack of operationalization and limited visibility and standards.

User Recommendations

- Scan opportunities for citizen data science to complement existing analytics and expert data science initiatives across the data science life cycle.

- Define the citizen data scientist as a formal persona. Define its “fit” relative to other roles, and identify those who fit the citizen data scientist profile.
- Track the capabilities (technology) and roadmaps of existing business intelligence (BI) and data science platforms and emerging startups for support of augmented features.
- Educate business leaders and decision makers about the potential impact of a broader range of users leveraging DSML to gain leadership support.
- Acknowledge that you still need specialist data scientists to validate and operationalize models, findings and applications.
- Provision augmented analytics tools (including but not limited to citizen data science tools), platforms and processes to support and encourage collaboration between business users, application developers and data science teams.

Sample Vendors

Aible; Alteryx; BigSquid AI; Dataiku; DataRobot; dotData; H2O.ai; SAS; SparkBeyond; Tellius

Gartner Recommended Reading

Worlds Collide as Augmented Analytics Draws Analytics, BI and Data Science Together

Build a Comprehensive Ecosystem for Citizen Data Scientists to Drive Impactful Analytics

Pursue Citizen Data Science to Expand Analytics Use Cases

The 5 Myths of Citizen Data Science

Best Practices to Avoid Citizen Data Science Failure

Conversational User Interfaces

Analysis By: Magnus Revang, Van Baker

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition

Conversational user interface (CUI) is a high-level design model in which user and machine interactions primarily occur in the user's spoken or written natural language. The sophistication of a CUI can vary from understanding just simple verbal utterances to handling complex multiturn interactions.

Why This Is Important

CUIs promise a shift in responsibility between the user and the interface. In traditional UIs, the user operates the technology and is largely responsible for the effects of using it. In a CUI, this responsibility shifts. The CUI is responsible for determining the user's intention and executing it, meaning the CUI has taken over some of the responsibility from the user. This makes CUIs the first widespread adoption of agent user interfaces for software, devices and the IoT.

Business Impact

The conceptual shift away from the user as the operator, toward the user conversing with an agent that will execute on a determined intention, has a 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 CUIs becoming the dominant interaction model in the future.

Drivers

- The 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 it reaches its potential. Vendor and technology choice are tactical for the foreseeable future. Voice will also arrive as a strong modality.
- Users increasingly expect to be able to hold conversations and ask natural language questions of applications they use.

Obstacles

- Developing a good CUI requires much more effort than similar instructional GUIs. More intelligence has to be built into the conversation to deal with different kinds of users, different modalities and different edge cases.
- A conversational UI will make predictions about the user's intent. These predictions will sometimes be wrong, so the designer of a CUI has to have deeper knowledge about potential consequences, and design defensively with nonreversible actions and keeping ambiguity in mind.
- CUIs will need to employ anthropomorphism for the foreseeable future, lending elements of human communication to make it easier for users. A lack of personality, fragmented tone of voice, poorly written dialogue and flows that do not align with the user's behavior are affecting user sentiment toward CUIs, labelling them simple and, in many cases, useless.

User Recommendations

- 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 entering the market, such as CUI-to-CUI communication and specialist tooling.
- 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.

Digital Adoption Solutions

Analysis By: Melissa Hilbert

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition

Digital adoption solutions (DASs) improve adoption and usage of technology across an organization, aiding digital transformation. A DAS provides in-application guided learning that helps users complete business processes, giving a consistent user experience, providing visually clear paths to complete tasks and reducing manual entry. Analytics provide insight into usage and where improvements can be made to help tie to key metrics for ROI. Nudges help change user behavior to improve outcomes.

Why This Is Important

DASs enable 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. For external use cases where your company sells software, consider white labeling a DAS. Its capabilities help with onboarding, user adoption and increased customer satisfaction.

Business Impact

DAS can provide high value to an organization looking to improve adoption of and employee experience with work applications.

The return for a DAS solution can be measured by:

- Reducing employee onboarding and training costs
- Speeding time to new-hire productivity
- Eliminating change management training
- Reducing support tickets

DAS benefits include:

- Little technical involvement and quick deployment
- Little, if any, degradation in performance of the original software

Drivers

Digital adoption solutions are relevant for any organization in any vertical. Evident use cases to date include where SFA, HR, ERP or digital workplace solutions are used. Additionally, they are relevant for organizations selling software where its customers' adoption and usage are of concern.

The solution provides:

- In-application guidance to accomplish a task quickly
- Light automation of some data entry, reducing manual data entry and errors
- Cross-application support, removing the burden of moving between applications manually
- Macro and micro analytics to understand usage and improve business processes, efficiency and user experience
- Deployment for cloud and, for some vendors, legacy on-premises as well

They are most helpful when:

- There are multiple solutions that need to be adopted for employees to perform their jobs
- There is poor adoption of existing solutions
- Tasks are complex within an application
- Tasks are performed infrequently
- Business processes are changing frequently
- An application changes frequently
- Customer end users using your software have low adoption rates

Obstacles

- On-premises applications behind firewalls are more difficult to connect to and will be more costly to deploy.
- Some vendors utilize a per-application (including varying pricing for application complexity) and per-user pricing model, which can increase costs when deploying at the functional or enterprise level.
- Many vendors do not support mobile application usage elegantly.
- DAS vendors do not employ machine learning intelligence recommendations yet.
- Some vendors do not support cross-application deployment well.

User Recommendations

- Investigate DAS where there is lack of adoption for a required application such as sales force automation (SFA), ERP or Office 365 (O365) as a first use case within a job role.
- Create a plan by functional area to incorporate DAS and prioritize across the entire tech stack.
- Within a functional area, evaluate all applications for an employee's work hub (all applications used to get work done).
- License a DAS in a bundled purchase for a functional area or at the enterprise level to minimize pricing of the overall solution.
- Create goals and tie them to trackable metrics such as a reduction in support tickets to prove positive results.
- Ensure analytics are deep at both a macro and a micro level and can cross applications for a single workflow.
- Make sure to include employees in the design and testing of the workflows and to benchmark and track improvements to performance.

Sample Vendors

AppLearn; Digital Attitude; EdCast; InsideBoard; Knowmore; Pendo; tts; WalkMe; Whatfix

Gartner Recommended Reading

Improve Employee Usage, Engagement and Productivity With Digital Adoption Solutions

Utilize Digital Adoption Solutions to Assist With Process Transformation and Employee Experience

Video: Digital Adoption Solutions Improve Employee Productivity

Observe, Measure and Assist: Three Emerging Ways to Drive Workforce Digital Dexterity

Employee Wellness

Analysis By: Sam Grinter

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Early mainstream

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 dashboards 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 and challenges).

Why This Is Important

The nature of work and life has changed. Employees may find themselves working from home more of the time, and/or that the level of activity and how work is completed have altered. This disruption will increase stress and anxiety among employees, which increases the risk of burnout. To offset this, employers should make investments to reduce stress and anxiety and to promote healthy living. This can be achieved through investment in employee wellness.

Business Impact

Wellness programs have historically focused on reducing employer healthcare costs. Recent evidence suggests that these initiatives offer limited and indirect cost savings, and other initiatives (such as disease management) are more effective at reducing healthcare costs. Employers are looking beyond cost control to determine how a more holistic, consumer-driven wellness initiative can positively influence employee experience, digital dexterity, organizational culture and business productivity.

Drivers

- Prior to COVID-19, demand for employee wellness solutions was limited to moderate. However, Gartner has noted an uptick in interest, as employers act to respond to the hidden impacts of COVID-19, such as depression and reduced physical activity.
- When deployed, employee wellness initiatives are usually incorporated as part of a wider organizational-culture and employment value proposition (EVP) initiative. The value of employee wellness programs should stand employers in good stead with the workforce, potentially increasing loyalty among employees who value such initiatives.

Obstacles

- The biggest challenge for employee wellness remains the difficulty in quantifying the ROI and value of such an initiative. As such, employee wellness vendors have only found success among larger employers. These include employers who have the budget to spare for such initiatives and that do not require a rock-solid business case to spend it, and those whose culture is based around wellness and well-being.
- A future obstacle for this market is what happens once COVID-19 subsides. Will the uptick in demand continue? The answer to this question is currently unclear. It is likely that the attitude of society toward well-being will have shifted, and that it will take longer to revert back to the previous state (if it does at all). However, given the historic limited fortunes of this market, it is unlikely we will see much in the way of significant further adoption of such solutions.

User Recommendations

- Think holistically, and pilot where possible to justify further investment. 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. Wellness coaches, and recognition and rewards tools, can play a key role in encouraging participation and building communities.
- Enroll senior leadership as champions for wellness and well-being. 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.
- Plan how employee wellness technology will connect with your wider HR technology ecosystem. Employee wellness can be delivered via point solutions, benefits management systems and HCM suites. Buyers should first review the wellness capabilities offered by existing benefits and HCM providers, and then consider wellness point solutions if needed.

Sample Vendors

Apple; Castlight; ComPsych; Fitbit; GO Mammoth; Limeade; Virgin Pulse; Vitality; Welltok; Whil

Gartner Recommended Reading

Employee Wellness: A Shift From ROI to Employment Value Proposition

Virtual Assistants

Analysis By: Van Baker

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition

Virtual assistants (VAs) help users with tasks previously handled by humans. VAs use semantic and deep learning models, natural language processing, prediction models, recommendations and personalization to interact with people via voice or text conversations. Increasingly, they also automate processes and workflows. VAs learn from user behaviors, build data models, and recommend and complete actions to support VA users. VAs can be deployed in simple as well as complex use cases.

Why This Is Important

Conversational interactions are inherently appealing to both customers and members of the workforce. The ability to converse with applications to retrieve information or accomplish transactions is a natural extension of human-to-human interactions to human-to-machine interactions. A well implemented virtual assistant is always available, cannot be distracted, and can be very efficient in assisting humans in accomplishing tasks and retrieving necessary information.

Business Impact

VAs, RPA, event brokers and other technologies are automating the enterprise. VAs use contextual multiturn conversations to drive business workflows. Integration with enterprise applications enhances the handling of complex tasks by VAs. Consumer VAs led to enterprise VAs embedded in SaaS platforms. Business channels such as websites, mobile apps and messaging are commonplace. Voice-based VAs are becoming the focus of conversational AI providers. Additionally, use of VAs can expand hours of operation and improve customer response time.

Drivers

- Customer expectation for access to customer service anytime, anywhere. This is especially true for online e-commerce businesses that have seen extreme growth in response to the pandemic.
- Consumer expectation for access to product information anytime, anywhere. E-commerce is a 24/7 business and consumers expect to get their answers whenever they engage.
- Employee access to information on a real-time basis via conversational queries, resulting in enhanced productivity because of increased use of business-critical information.
- Increasing demand for technology that is easy to understand and interact with. While this is true for all workers, it is especially needed by remote workers in the enterprise.
- A strong desire by businesses to automate business workflows and processes wherever automation can deliver value to the business.
- The ability to initiate communication with your workforce in response to event triggered conditions or transactions. This facilitates more timely response to changing business conditions by removing the need for workers to initiate transactions.
- The ability of conversational AI platforms to deliver more complex transaction capabilities spanning multiple users and business processes.
- Improved access to the business across multiple channels addressing the preferences of particular customer segments, allowing them to select their channel and modality of choice.
- Improving capability for conversational AI platforms to use natural language generation. This allows the virtual assistants to initiate interaction with customers and employees rather than just reacting to user requests.
- VA tools are becoming available that enable the automatic ingestion of unstructured and structured data to enhance and improve the language models.
- Enabling technologies are making creation of VAs easier such as low-code tools, automated identification of intents and entities, and the use of APIs for complex integrations.

Obstacles

- Poor or inadequate language models for the use case that is deployed. The virtual assistants need to be able to respond to an extraordinary variety of users' questions. They should also be able to handle off-topic questions to some degree.
- Inadequate conversational AI platforms that do not have the capabilities needed to deliver virtual assistants. Many platforms lack the ability to handle complex transactions, context switching, multi-intent utterances, strong integration, process automation and other functionality needed for virtual assistance level capabilities.
- A design approach that oversimplifies use cases for virtual assistants. Many dialogue designs assume consistency in the way that people ask questions or do transactions that do not exist. This often leads to successful pilot development efforts that fail upon deployment.
- The need for ongoing continual retraining of the language models is often overlooked or ignored leading to poor performance over time.

User Recommendations

- Assess the continual rapid evolution of the technologies that support the creation and deployment of virtual assistants. These technologies are evolving at a very rapid pace that is not expected to slow in the near term.
- Deliver significant levels of integration and business process automation in conjunction with virtual assistant conversational capability as the platforms in the market are becoming increasingly sophisticated. Many conversation AI platforms include workflow automation capabilities as part of their offering.
- Evaluate that VAs will have voice and text capabilities with voice becoming the dominant modality.
- Define a chatbot strategy at the enterprise level and decouple the technical decisions from it.
- Pick your core services by favoring modular technical solutions that allow the same.

Gartner Recommended Reading

When Should I Use Embedded Conversational Assistants?

Making Sense of the Chatbot and Conversational AI Platform Market

Craft a Chatbot Initiative Based on Your Business Requirements and Solution Complexity

Roles and Responsibilities for Scaling Chatbot Initiatives

Solution Criteria for Enterprise Conversational AI Platforms

IoT Business Solutions

Analysis By: DD Mishra

Benefit Rating: Transformational

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition

IoT business solutions are often implemented by integrating IoT devices, IoT data, IoT platforms and IoT applications — combined with IT assets (business applications, legacy data, mobile, and SaaS) — to work together toward desired business outcomes.

Why This Is Important

IoT adoption is rapidly increasing; the enterprise IoT platform market will grow to $7.6 billion in 2024 with a 31% CAGR. Companies are investing in a wide range of diverse IoT technologies and integrating them into different applications in order to drive different business outcomes. To succeed in IoT implementations, application leaders must thoroughly examine and understand the full scope of end-to-end IoT business solutions and the functional role of IoT platforms within them.

Business Impact

IoT Business solutions are widely used in different verticals such as Pharmaceuticals, Healthcare, Energy, Transportation among others, with use cases ranging from plant and process automations, smart contract solutions, asset tracking, inventory management, resource utilization and energy conservation.

Drivers

- The potential benefits and drivers vary from organization to organization, but we see the demand for asset tracking, predictive maintenance, productivity and process, and power optimization as the key driver for growth and adoption of IoT.

Obstacles

- IoT Implementations often encounter bottlenecks and hurdles across businesses. The inhibitors of growth include technical complexity, security and privacy challenges, integration challenges and skill gaps.

User Recommendations

- Analyze your desired business outcomes. While limited IoT point solutions themselves can deliver some business value, more complete IoT business solutions can achieve expanded outcomes via automated business responses.
- Plan what your end-to-end IoT business solution should look like, clearly identifying and prioritizing which IoT-enabled business outcomes you desire and create a roadmap.
- Commission an IoT center of excellence (COE) to explore the potential business value of IoT solutions and their potential impact on existing business units, IT infrastructure and your business processes and applications.

Gartner Recommended Reading

Predicts 2020: As IoT Use Proliferates, So Do Signs of Its Increasing Maturity and Growing Pains

Use the IoT Platform Solution Reference Model to Help Design Your End-to-End IoT Business Solutions

Robotic Process Automation

Analysis By: Robert Hetu, Hanna Karki

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

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.

Why This Is Important

The ongoing pandemic forces retailers to optimize costs and redeem savings by eliminating and revamping outdated processes. Labor is one of the highest costs on the balance sheet, and with the competitive pressure from an industry during a seismic transformation, staff will be impacted by job loss or redeployment. 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.

Business Impact

- RPA not only provides efficiencies and cost savings to retail core processes, it also highly impacts customer satisfaction and organizations' bottom lines.
- Immediate and quantifiable business impact can be attributed to manual effort savings, cycle time and error reductions, cost to serve and improved overall stability. These indirectly impact customer satisfaction and other top-business level goals.

Drivers

- Several existing retail business processes such as merchandising, supply chain, customer support and back-office operations require extensive manual effort. Many retailers, even those at the Tier 1 and Tier 2 level, are still heavily reliant on Microsoft Excel, Access or other spreadsheet tools in many areas of their company.
- Separate customer and product data repositories, legacy architecture and siloed organization structures necessitate manual data transfers that are time-consuming, fail to deliver robust or accurate results and are prone to errors.
- Seismic disruption in the retail industry means that traditional multichannel retailers have a critical need to optimize labor costs and improve efficiency.
- Headquarters, with large numbers of well-paid associates, are prime targets for reduction and elimination through automation.
- The 2021 Gartner CIO Survey indicates that a higher percentage of retailers are planning to deploy RPA within the next 12 months, playing catch up with other industries.
- RPA is therefore on a path to catch up with other industries, and growing interest has driven it into the trough for 2021.

Obstacles

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 cataloged and curated ones, 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.

User Recommendations

- 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.
- Create strong foundations for automation selection, maintenance and governance by working closely with your company's center of excellence for automation. 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 specific KPIs to ensure that customer-facing automation will not have a negative impact on customers' experiences. Use the lessons to develop a more comprehensive RPA implementation plan. This is a critical part of the learning experience for the organization.
- Ensure that your choice of automation supports both short- and long-term business goals by partnering with the business to build a comprehensive customer fulfillment automation roadmap.

Sample Vendors

Atos|Syntel; Automation Anywhere; Blue Prism; Cognizant; Jacada; Pegasystems; Tech Mahindra; UiPath; WorkFusion; Zensar

Gartner Recommended Reading

6 Steps to Tenable and Quantifiable Results Through Algorithmic Retailing

Infographic: Artificial Intelligence Use Case Prism for Retail

Preparing for the AI-Based Retail Nervous System

What Retail CIOs Need to Know About AI for Merchandising

Desktop as a Service

Analysis By: Stuart Downes, Mark Margevicius, Tony Harvey

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition

Desktop as a service (DaaS) solutions provide a virtualized desktop experience to workers, entirely from a remote hosted location such as the public cloud. DaaS eliminates the need for businesses to purchase the physical infrastructure associated with desktop virtualization, instead functioning through subscription- and usage-based payment structures. DaaS includes provisioning, patching and maintenance of the management plane and resources to host workloads.

Why This Is Important

DaaS provides secure remote access to applications and desktops using a network connection. No data resides on the endpoint, offering a solution that can increase security, redundancy, bursting and performance for remote workers. DaaS offers scalable services, allowing clients to appropriately size and consume their environments hour by hour, day by day, and month by month; however, not all have such granular billing options.

Business Impact

The pandemic highlighted the requirement to deliver secure desktop and application experiences to users in any location:

- Revenues grew by 98% in 2020 compared to 2019 as clients adopted DaaS to secure work-from-home experiences.
- DaaS enables business continuity and anywhere operations for home-based and hybrid home-office operations.
- DaaS enhances security for BYOPC use cases reducing risks for businesses.

Drivers

- Improve security and compliance — centralize data, minimize exposure on notebook PCs.
- Support remote work with no data residing on the endpoint.
- Endpoint computing models that allow any device models and bring your own PC (BYOPC) endpoints.
- Simplified end-user computing operations that are performed in the cloud, especially evident with a highly distributed workforce.
- Business continuity, the main driver for DaaS growth in 2020.
- On-demand desktops.
- A financial model that allows scaling of cloud resources and an opex model.
- Scaling to meet the needs of short-term employees, such as seasonal workers.
- Securely extend services to external contractors, including IT developers and business process outsourcing (BPO).
- Enabling rapid access to systems during mergers, acquisitions and divestitures.
- Rich graphics use cases like engineering, games development, fashion and geographic information systems (GIS) benefit from GPU-enabled workstation class virtual desktops and applications.
- Where supply of devices, or high attrition rates, makes the provision of a physical device difficult.
- Eliminates the need for complex virtual desktop infrastructure (VDI) implementations.
- Enables business expansion to new regions without the need to deploy data centers.

Obstacles

- Cost — In many cases, direct infrastructure cost comparisons show higher IT costs for DaaS compared to VDI or desktop PCs, usually the business case turns positive only when business and users costs are included.
- Multimedia streaming, web meetings and video call performance in DaaS are not equivalent to that of a physical endpoint.
- Applications and data that are landlocked in on-premises data centers that have, or are perceived to have, network-related performance issues when the desktop or application is hosted in the cloud.
- Some DaaS solutions require complex configuration, which, although simpler than VDI, can in some cases require careful configuration and selection of appropriate storage services to ensure a performant DaaS experience.

User Recommendations

DaaS will continue to mature and increase in adoption through 2025. DaaS is yet to move through the Trough of Disillusionment onto the Slope of Enlightenment. Clients should:

- Understand the three DaaS market segments and select a vendor from the appropriate segment: (1) Client-defined DaaS: Clients configure their DaaS experience and manage their workloads. This requires less skill than VDI; *2) Vendor-defined DaaS: The vendor configures the DaaS experience and clients manage their workloads; and (3) Managed DaaS: The vendor configures the DaaS experience and the vendor manages the workloads.
- Choose a DaaS vendor whose services best align to your requirements; even within each segment, there are differences between the services vendors offer.
- Optimize multimedia streaming, web meetings and video calls.
- Select a DaaS vendor that offers billing granularity that you require; some are granular hour by hour, others day by day or month by month.

Sample Vendors

Amazon Web Services; Citrix; Evolve IP; Microsoft; SACA; SimpleCloud; VMware; Workspot

Gartner Recommended Reading

Market Guide for Desktop as a Service

Microsoft's Restrictions for Licensing Windows and Office 365 for VDI/DaaS on AWS and Other Hyperscale Clouds Require Attention

Physical, Virtual and Cloud Desktops: Is a Hybrid Approach Inevitable?

How to Build a Successful Business Case for Desktop Virtualization

Intranet as a Service

Analysis By: Gene Phifer

Benefit Rating: Moderate

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition

An intranet as a service, typically delivered via the combination of a cloud office solution and an intranet packaged solution (IPS), is an easily deployable SaaS package that provides out-of-the-box functionality and interfaces that deliver web- and mobile-based intranet solutions. Intranet-as-a-service vendors facilitate configuration, customization, integration and management to align with customers' digital workplace initiatives, providing the core technology for modern intranets.

Why This Is Important

Intranets are the centerpiece of many digital workplace strategies. Many intranets are mired in old ways of thinking and have outdated content. They aren't providing what employees need to access their content and applications and to collaborate with others. Intranet as a service provides a key technology that allows enterprises to move forward. With the advent of COVID-19, this model proved to be a salvation for many enterprises, enabling employees to work remotely with nothing but a browser.

Business Impact

Intranets, done right, are the lifeblood of enterprises. They empower employees with the information, content, applications, communication, collaboration and knowledge they need to be efficient and effective. They provide employee self-service capabilities while enabling various business processes.

Intranet as a service is intranet done right, allowing an enterprise to move from a traditional to a modern intranet and to support the processes and employee experience a digital business needs.

Drivers

- The move to cloud computing. Intranet as a service is delivered predominantly in a SaaS model, fitting nicely the cloud computing strategies of most organizations.
- The rush to digital from COVID-19. As employees were sent home to work in response to the COVID-19 pandemic, intranet as a service proved to be a substantial enabler of the work-from-home crowd.
- The desire to improve and evolve existing intranets. Many intranets are old, outdated and stale; they don't give employees what they need. Many enterprises are looking for something better. Intranet as a service is a key ingredient to many new, modern intranet implementations.
- The need for flexibility and agility. Intranet as a service provides a flexible model for intranet deployment. It allows a "front door": the primary entry point for accessing intranet services. They also allow multiple "side doors," providing alternate access to intranet services for different use cases, such as wireless access for a frontline worker or a conversational model for hands-free access.
- Time to value. The out-of-the-box features of intranet as a service are generally available within two months.
- The need for a variety of tools. While IT provisions a set of intranet tools, it is common to see tools provisioned by business units or teams or used by individuals. Intranet as a service supports the integration of IT-provisioned as well as other intranet tools.

- The pervasiveness of cloud office tools. Microsoft 365 and Google Workspace are common among large enterprises. These cloud office tools, while valuable, don't provide a finished intranet, lacking the "glue" that binds together intranet services and the ability to deliver a robust intranet destination site. Intranet as a service tools feature an end-user-oriented web publishing model, which allows enterprises to create a single destination site, a set of decentralized destination sites or an employee portal.

Obstacles

- Many traditional intranets are bound to an on-premises model. They run on local-area networks with file servers housing content, and applications that run on on-premises servers and mainframes. While an intranet as a service can be architected to include some on-premises features, this complicates the solution, and in some cases, requires a parallel VPN to access ongoing on-premises data, content and applications.

- Some enterprises think that all they need is a cloud office tool to deliver a modern intranet. They end up force-fitting tools that weren't built for robust website creation, and as a result, delivering a suboptimal employee experience.

- Other enterprises think that all they need is a web content management (WCM) server. This is what might be called a do-it-yourself model, which requires significant amounts of construction. It is a build model, whereas an intranet as a service is more of a buy model.

User Recommendations

- Fix your broken intranet with a high-value, composable solution to allow flexible deployment to different types of users and use cases.

- Target out-of-the-box, rapidly deployable intranet solutions with an intranet as a service to deliver fast time-to-value.

- 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, but a key part it is.

Sample Vendors

Akumina; Beezy; Igloo Software; Interact; LiveTiles; LumApps; MangoApps; Powell Software; Simpplr; Unily

Gartner Recommended Reading

Traditional Intranets Are Dead — Modern Intranets Are Alive and Well: Part 1Traditional Intranets Are Dead — Modern Intranets Are Alive and Well: Part 2

Modern Intranet Top Practices

Market Guide for Intranet Packaged Solutions

Tool: Intranet Packaged Solutions Vendor and Product Data

Chatbots

Analysis By: Magnus Revang

Benefit Rating: High

Market Penetration: More than 50% of target audience

Maturity: Early mainstream

Definition

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

Why This Is Important

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. Offerings in the market include developer self-service platforms, managed products, middleware offerings, integrated offerings and best-of-breed approaches.

Business Impact

Chatbots are the face of AI and will impact all areas with communication between machines and humans. Customer service is an area where chatbots are already very influential and will have a great impact on the number of service agents employed by an enterprise and how customer service is conducted. The change from “the user learns the interface” to “the chatbot learns what the user wants” has implications for onboarding, training, productivity and efficiency inside the workplace.

Drivers

- Chatbots in social media, service desk, HR or commerce, as enterprise software front ends and for self-service, are all growing rapidly.
- For enterprises, the main challenge with chatbots has been scaling and operationalizing them out of the proof-of-concept phase. As COVID-19 has accelerated adoption of chatbots, vendors seem to have “cracked the code” on operationalization. Vendors are now able to deliver multiple bots for multiple use cases, with no-code environments allowing multiple roles to participate in operationalization. This is creating a market for enterprise conversational AI platforms fueling the next generation of chatbots.

Obstacles

- Scaling and operationalizing still remain a challenge in some cases, due to lack of dedicated internal teams to work on continuous improvements.
- Figuring out the composition of teams, and the methodologies to iterate effectively, are still emerging practices with strong vendor dependency.
- Technology is improving at an astounding pace, but best practices on adoption and use of these technological advancements are still trailing, resulting in a lot of trial and error for enterprises.
- Selected vendors are sometimes unable to keep pace with the technology and the market dynamics.
- The vendor landscape comprises over 2,000 vendors, despite some consolidation during 2020. However, this is composed of many subcategories, majority of which are tactical. With this many vendors, the majority of chatbots will have to switch their underlying technology in the near to midterm future. Still a category of enterprise-grade platforms has emerged, with an estimated 120 vendors. These enterprise-grade platforms are becoming suitable as a more tactical choice.

User Recommendations

- Select an enterprise-grade platform to develop multiple use cases with orchestration of the assets needed.
- Focus on operationalization of chatbots as a product, with the necessary organization and roles in place, to evolve and maintain chatbots over time.

Sample Vendors

Amazon; Amelia; Cognigy; Google; IBM; Kore.ai; Microsoft; Pypestream; ServisBOT; Uniphore

Gartner Recommended Reading

The 3 Decisions You Must Make Before You Begin a Chatbot Project

Consolidate Your Chatbot Initiatives Into a Single Enterprise Strategy

When Should I Use Embedded Conversational Assistants?

Citizen Integrator Tools

Analysis By: Massimo Pezzini, Tim Faith

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Early mainstream

Definition

Citizen integrator tools are typically cloud-hosted services providing very intuitive, no-code integration process development tools. This way expert business users with minimal IT skills can handle relatively simple application, data and process integration tasks (or "automations") by themselves. Citizen integrator tools also provide a rich set of packaged integration processes (PIPs) that business users can rapidly configure and run with no assistance from integration specialists.

Why This Is Important

Organizations must address a growing amount of integration challenges in shorter and shorter timeframes, which implies having at their disposal several “integrators” equipped with high productivity tools.

Citizen integrator tools enable business users with minimal IT skills to perform self-service integration work, thus increasing the organization’s overall delivery capacity. However their ungoverned proliferation can lead to security and compliance risks and duplicated costs.

Business Impact

Citizen integrator tools enable business users to automate tasks currently integrated via slow and error-prone manual methods. Integration specialists or ad hoc integrators (developers, SaaS administrators), also use these tools to quickly sort out simple tasks instead of using more powerful, but expensive and complex tools. Therefore, citizen integrator tools contribute to improving organizations’ efficiency, productivity, agility and innovation by reducing the relevant integration costs.

Drivers

- Citizen integrator tools may help deliver business value faster, reduce integration costs and support tactical or strategic digital initiatives. These outcomes are achieved by enabling rapid, pervasive integration by a wide range of employees within (and potentially also outside) the organization. However they are available in many forms, which address different markets and needs: PIPs — At times called “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. As such buyers are typically application owners or SaaS administrators. Integration software as a service (iSaaS) — Cloud services that enable users to implement brand new PIPs and to deploy, run and customize existing ones. They are typically sold to individual business users or work teams. Integration platform as a service (iPaaS) — These are targeted to professional integrators, but several iPaaS provide an iSaaS-like development environment and/or make available collections of configurable PIPs atop their platform.

- iSaaS tools have achieved notable traction in the consumer and SMB markets, thanks to their very low cost of entry, intuitive user experience, low skills demand and their rich set of PIPs. However, they have failed to penetrate other segments due to their lack of enterprise capabilities and services (for example, consulting).

- PIPs and iPaaS providing citizen-integrator-oriented capabilities are becoming more and more popular in midsize, large and global organizations. The growing use of AI, ML, NLP and chatbots in iPaaS offerings to facilitate integration development is augmenting their appeal for citizen integrators, thus further favoring adoption.

Obstacles

- Business users are increasingly technology savvy and often driven by time-to-market pressures, especially in the post-pandemic era that 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 for them. However, this will create a few challenges: If not framed in a proper governance model, citizen integrator tools adoption by business users will inevitably lead to security, compliance, management and governance issues.
- Although some central IT departments will adopt a positive attitude and proactively address these challenges, others will try to stop business users from leveraging these tools to prevent these risks. In addition, excessive expectations for ultra-easy, super-fast integration and the simplistic nature of some citizen integrator tools may still lead to disappointment, thus hindering their more widespread adoption.

User Recommendations

Software engineering leaders responsible for integration should:

- Engage with business teams to understand their automation needs and identify to what extent citizen integrator tools can improve their responsiveness and productivity.
- Approve, certify and support a set of citizen integrator tools that meet these needs 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.
- Beware when selecting citizen integrator tools that: some tools are rather simplistic and lowest-common-denominator in nature; and PIPs provided by SaaS vendors may have been designed for a professional IT developer audience.
- Give preference to providers that can support both “professional” and citizen integrator requirements when selecting an iPaaS.

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

Sample Vendors

Adeptia; Celonis (Integromat); elastic.io; IFTTT; Microsoft; Quickbase; Tray.io; Workato; Zapier

Gartner Recommended Reading

Accelerate Your Integration Delivery by Using Packaged Integration Processes

The Applications of the Future Will Be Founded on Democratized, Self-Service Integration

Quick Answer: When to Use (or Not Use) Embedded Integration Features Provided by Your SaaS Vendor

Climbing the Slope

Meeting Solutions

Analysis By: Tapan Upmanyu

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Early mainstream

Definition

Meeting solutions are real-time collaboration tools that support 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.

Why This Is Important

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, content sharing to support hybrid working environments for real-time collaboration between local and remote participants. Meeting solutions also offer audio-video enabled meeting room systems for office spaces like boardrooms and training rooms.

Business Impact

Meeting solutions offer a richer and more flexible experience than audio conference bridges and video rooms. A properly specified meeting solution for workers' activities and needs can:

- Enable faster decision making for internal collaboration and speed up business processes such as sales, interviews, training, etc.
- Reduce travel costs and in-person visits.
- Enrich customer experiences.

Drivers

- Remote and hybrid workplaces postpandemic have increased the need for advanced conferencing and collaboration tools.
- Hybrid work environments require real-time collaboration for internal and remote workforce to increase the engagement, inclusion and visibility for remote workers. Meeting solutions come with messaging-based real-time collaboration, content sharing and virtual whiteboards, either as embedded capabilities or options to integrate with third-party applications.
- Meeting participants prefer the bring-your-own-device (BYOD) method to access meeting solutions. Majority of vendors offer the options to participate in the meetings from personal computers (downloadable applications or browser-based clients), mobile phone-based applications and the meeting room kits.
- Users expect an enhancement in premeeting and postmeeting experience than the legacy conferencing tools. Modern meeting solutions are including the innovations through AI to add a degree of automation to levitate the premeeting, during the meeting, and postmeeting experience for the users.

Obstacles

- Digital workplace leaders responsible for managing the meeting portfolio often struggle to select the best solution for the organization, as the communication requirements of different users, departments and teams vary with their operations.
- Some users see meeting solutions as a replacement of audioconference and conference bridge alone. However, they also have additional valuable functions for workstream collaboration, online training, webinars, among others. The users may miss out on leveraging the benefits of these collaboration features.
- The pandemic has increased hybrid workplaces where a proportion of the employee base will work from remote locations. These hybrid workplaces demand similar experience for the meetings, no matter if the participants are joining from office or remote locations.

User Recommendations

- Evaluate the meeting use-case scenarios for the organization and select the most suitable vendor from available options. Selecting more than one vendor may be necessary, as one solution may not support all the scenarios.

- Improve meeting experiences by first looking at innovations in the meeting products they have already deployed. Experiment with workstream collaboration technology, meeting-related virtual personal assistants, natural language processing, meeting transcription, digital whiteboards.
- Select technologies that offer consistent experiences on mobile devices and desktops for both browser-based application and downloadable client application, and in meeting spaces.

Sample Vendors

BlueJeans by Verizon; Cisco; Google; LogMeIn; Microsoft; Zoom

Gartner Recommended Reading

Magic Quadrant for Meeting Solutions

Critical Capabilities for Meeting Solutions

How to Pick the Right Virtual Meeting Portfolio and Save Money

Improve Remote Work Effectiveness by Rising to These Top 10 Meeting Challenges

Team Collaboration Devices

Analysis By: Stephen Kleynhans

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition

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

Why This Is Important

Plans for future office use include a focus on increasing and improving meeting spaces. Team collaboration systems act as intelligent whiteboards and can improve meeting experiences. They include software to manage meetings (e.g., start, stop, share), 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 use the device with limited or no sign-in process.

Business Impact

As the nature of work becomes increasingly collaborative, organizations will invest more to equip shared workspaces to encourage physical and virtual collaboration. The rise in remote workers increases the need for better tools that extend the meeting experience to all participants.

Drivers

With all meetings now including some remote participants, the need for a digital whiteboard solution has increased. Team collaborative systems are positioned at the premium end of the market and provide:

- Easy walk-up usage with minimal effort on the part of users, including inviting the device to join a meeting
- High-precision pen inputs with low latency, to make drawing feel natural
- An embedded whiteboard canvas with easy capture to an enterprise repository (e.g., Microsoft OneDrive for Business and Google Docs), and usually the ability to support third-party collaboration canvas applications
- Content sharing with local and remote participants (Microsoft Teams and Cisco Webex)
- Security that removes meeting content from the device after it ends
- Integration with enterprise collaboration tools

Team collaborative systems combine these capabilities into an easy-to-deploy and easy-to-operate solution that spans multiple use contexts. Smaller units are well-positioned for huddle spaces, offices and ad hoc meetings, with larger units servicing full-size meeting rooms. Both enable small-to-midsize groups to have more effective meetings, with some participation from remote participants. 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 in multitasking or conferencing.

Obstacles

- Team collaborative systems are priced at the high end of the market, compared with basic digital whiteboards. Prices run from $5,000 to $10,000 for entry-level systems to more than $25,000 for large, full-featured solutions.
- They are also often best integrated with a specific vendor's communication and collaboration ecosystem. In the current environment, many companies require access to multiple conferencing tools to handle internal and external meetings of varying sizes.
- Newer systems often offer access to alternative collaboration platforms, so they often sacrifice some of their simple, intuitive operation. Devices are often not used to their potential, because users are unfamiliar with their capabilities.
- These devices compete with and complement turnkey meeting room systems from various suppliers (e.g., Microsoft Teams Room and Zoom Room Systems) complicating meeting room design. However, products are improving to enable these separate solutions to work together smoothly.

User Recommendations

- Educate users, and develope localized expert champions to ensure ROI. Even though these devices are simpler to use than cobbled-together solutions, they are rarely used optimally, because users are often poorly trained or are unable to understand their value.
- 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.

Sample Vendors

Cisco; DTEN; Google; Microsoft; Prysm; Ricoh; Sharp

Gartner 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

Virtual Events

Analysis By: Christy Ferguson

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition

Virtual events bring large groups of people together online for short periods for defined purposes. 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 and/or external to an organization. Planning, operations and production workstreams typically operate in parallel to execute complex events. Hybrid events add virtual, remote experiences to face-to-face events.

Why This Is Important

Enterprises rely on events to achieve demand generation goals, accelerate deals in the pipeline and strengthen customer relationships. A variety of event types are required to support the engagement objectives with customers and buyers. Virtual events enable teams to engage attendees, execute dynamic content delivery, manage event logistics and integrate with other technologies in order to deliver world-class experiences for attendees.

Business Impact

The proliferation of virtual events due to the COVID-19 pandemic required a new approach and focus on engagement. The hype accelerated as enterprises were forced to shift to virtual delivery models and quickly turned to a need to expand into a hybrid model as in-person events return. As enterprises look to the future, hybrid event strategies — a mix of in-person and virtual event models — will grow. While virtual events have a place in this future, support for multiple delivery models, including in-person, will be necessary.

Drivers

- The global health pandemic resulted in the mass cancellation of in-person events, which forced enterprises to accelerate digital transformation and rethink the entire event experience, resulting in a quick shift to virtual events.
- Audience reach of virtual events increased when compared to in-person events as barriers of travel budgets and schedules became less prominent.
- The cost-effectiveness of virtual events enabled enterprises that had not hosted their own events to expand into this engagement channel over the last year.
- While Gartner clients have expressed interest in hybrid delivery models that enable streaming in-person content to virtual attendees, Gartner sees hybrid evolving as an event strategy that requires both in-person events and separate virtual events supported in a single platform where users have real-time access to all event data in one solution.

Obstacles

- As in-person events return, enterprises will need to determine whether a point solution to deliver virtual events is the most appropriate. As the market evolves, enterprises should expect to see the growth of all-in-one solutions that can deliver every event model: virtual, in-person and hybrid.
- The hybrid event model has yet to be fully defined, and vendors are immature in this delivery model.
- The expansion from adjacent markets is likely to include well-established meeting solutions that will broaden their offerings to meet the needs in this market over time.
- Integrations and ecosystems are lacking in this market, impacting the ability of enterprises to leverage attendee engagement data to move attendees along the buyer journey and measure return on investment.

User Recommendations

- Define objectives and determine whether an existing meeting solution or webinar tool will meet the needs of one, some or all of your virtual events. Use virtual event vendors when you have multiple tracks, require a high level of engagement requirement, plan various session types or seek to integrate data into a martech stack.
- Expect rapid product roadmap evolution and advancement in the market. Develop a clear understanding of plans to ensure that short-term goals and expectations are met.
- Develop the skill set among existing employees to manage virtual as attendee expectations increase. If not, seek professional services to supplement existing internal capabilities.
- Define expectations for integration to the existing technology stack, with a focus on attendee tracking. For example, session attendance, view time, survey results, meeting engagement and target account engagement are all metrics to track to optimize efforts and align back to objectives.

Sample Vendors

Bizzabo, Hopin, Intrado, ON24

Gartner Recommended Reading

Market Guide for Event Technology Platforms

Market Guide for Enterprise Video Content Management Systems

Magic Quadrant for Meeting Solutions

Event Data: An Opportunity to Improve Marketing Performance

The Future of Event Marketing: Virtual, Hybrid and In-Person Events

Insight Engines

Analysis By: Stephen Emmott

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

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 employees, customers or other constituents at timely business moments.

Why This Is Important

Insight engines use artificial intelligence (AI) to reinvent enterprise search, enabling enterprises to shift gear to semantic search, thereby unlocking patterns held within both unstructured and structured data, sourced internally and externally. Content and data are presented in context, as information, to deliver the insight needed for purposeful action. Insight engines provide the platform to gather content/data from myriad sources, enrich it for indexing, and query this via multiple touchpoints and integrations.

Business Impact

Insight engines are core to the digital workplace, amplifying digital dexterity by underpinning knowledge management. They apply across all domains (business functions and industry verticals), augmenting work in foundational and domain and situational scenarios; for example, intranet search or proactive recommendations within a CRM system. Insight engines also can be integrated with other software (for example, robotic process automation) to support the automation of workflows relating to content.

Drivers

Progress is driven by:

- Developments in semantic search, which drive the capability of insight engines, enabling content/data to be synthesized as information throughout the digital workplace
- Programmatic access to content (and other data sources) for various applications to support digital transformation (e.g., automation)
- The need to provide better user experiences with less friction, by including information in the applications where it is needed, bringing orientation, decision and action into one place/tool
- The need for an AI platform upon which multiple insight applications can be developed and delivered cohesively, and according to aspiration
- The fact that insight engines are now bundled with cloud office services provided by Microsoft (Microsoft 365) and Google (Google Workspace), providing a foundational service by default
- The need for custom-made applications aligned to domain and situational contexts, thereby providing deeper context and amplifying relevance

For these reasons and more, insight engines have reached more than 50% of target audience as the technology continues its ascent up the Slope of Enlightenment toward the Plateau of Productivity.

Obstacles

Progress is obstructed by the following:

- Deployment and maintenance is rarely done solo in-house, but rather involves the vendor and/or a third-party service provider, adding to the complexity and cost of professional services.
- Custom development is often required, expanding the time, skills and cost needed to attain higher aspirations for the technology.
- The range of connectors available for the ingestion of content and data varies from vendor to vendor. This constrains the choice of product according to available connectors, rather than the core purpose of semantic search, although custom connectors can be developed in most cases.
- Similarly, the range of prebuilt integrations into third-party applications is often limited, driving customers to further custom development.
- The complexity and expense of insight engines means they can be challenging for proof-of-concept initiatives, and usually entail a long-term (typically three-year) commitment once selected and deployed.
- Many organizations have yet to shift from simple to semantic search, leaving the employee benefits as desirable rather than essential for the majority of employees.

User Recommendations

To exploit this innovation:

- Place the beneficiaries — employees (or other constituencies as appropriate) — at the center by focusing the purpose of insight engines on ensuring that employees have the insight they need to decide and act, rather than searching.
- Personify employees, identify their use cases, and the applications they use to conduct their work, and the sources of content and data from which the information they need is retrieved or synthesized.
- Establish whether insight engines included in cloud office are sufficient for all employees and their use cases.
- Having just one insight engine is unlikely, so review and shape your portfolio to ensure you can address use cases across the foundational, domain and situational levels.

- Align expectations; at the highest level of maturity, insight engines synthesize information proactively in the context of work, but more typically they offer enhanced search.
- Ensure the steer of your portfolio is coordinated and linked to your wider natural language initiatives.

Sample Vendors

Coveo; Elasticsearch; Google; IBM; IntraFind; Lucidworks; Microsoft; Mindbreeze; Sinequa; Squirro

Gartner Recommended Reading

Magic Quadrant for Insight Engines

Critical Capabilities for Insight Engines

Citizen Developers

Analysis By: Jason Wong

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition

Citizen developers are employees not in the IT organization who create or extend application capabilities, mainly for internal consumption by teams or workgroups. They can use development tools and runtime environments sanctioned (or at least not actively forbidden) by corporate IT or the business units. A citizen developer is not a title, role or professional developer in the business unit, but rather a persona taken on by an employee.

Why This Is Important

Citizen development is part of the business-IT continuum and the democratization of technology trends. Business leaders are increasingly owning their departmental applications, as well as building an increasing number of applications themselves. The COVID-19 pandemic and remote working have accelerated 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.

Business Impact

The long-term strategic impact of citizen development is enabling self-service business innovation within business units. Citizen developers are often aided by IT in some aspects of co-creation or technical support. They can generate new ideas leading to greater business agility, as well as increased workforce efficacy and efficiency. Citizen development hackathons are a great way to promote and foster citizen development, while enhancing digital dexterity across the enterprise.

Drivers

- According to a 2021 Gartner survey on Reimagining Technology Work, 41% of respondents can be classified as business technologists. These are employees who don't report into an enterprise or business unit IT function yet they use tools to produce some technology output, such as analytics reports, apps or automation. (Note: Some of these business technologists are professional developers, such as software engineers, working in a business unit like marketing, or research and development. These professionals are not citizen developers, but do work with citizen developers.)

- Employees have easier access to more tools than ever before, and it's only increasing. A citizen developer is not a full-time professional developer, nor a specific role, but rather a persona of a business technologist using these tools. They may have some job responsibility to develop a solution, or simply choose to engage in development activities to achieve some business outcome for the greater good. Gartner's 2021 Hyperautomation Survey found that business technologists working on business-driven automation initiatives use on average 2.7 tools (out of 21 tools shown).

- Citizen developers feel more empowered by powerful low-code development tools and "no code" tools that specifically cater to them. Many vendors now provide robust low-code development platforms making it easier for citizen developers to develop their own applications — even applications that once required professional development skills, such as building mobile apps or using AI automation services like chatbots.

- Citizen developers may also take on other citizen personas depending on their skills, ambition and scope of work. Gartner often sees citizen data scientist, citizen integrator and citizen automator personas in the digital workplace. Over time, some of these citizen developers have become part of fusion teams including business and IT collaboration and development.

Obstacles

- IT leaders often have a negative view of development outside of IT and label it as "shadow IT." Citizen development is not shadow IT. IT's resistance to recognizing business technologists' work and embracing citizen development results in missed opportunities to drive toward business and IT alignment.
- IT leaders also often fear losing control on account of increasing citizen development activities, making their teams less relevant or burdening IT with unmaintainable apps. However, the risks of citizen development are typically outweighed by the benefits. Risks to IT can be better managed by directly addressing inadequate tooling and disorganized support for a citizen development community, which are key factors leading to poor outcomes and risky apps.

User Recommendations

- Engage nonprofessional business technologists more actively to enlist and enable them to become citizen developers. Ignoring or attempting to prevent citizen development often carries more risks and limits enterprise innovation.
- 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.

Gartner Recommended Reading

How to Define and Guide Citizen Development Practices

Platform-Enabled Citizen Development (BP)

Democratize and Distribute Technology Work Across the Entire Enterprise to Accelerate Digital Business

Entering the Plateau

Cloud Content Services

Analysis By: Marko Sillanpaa, Michael Woodbridge

Benefit Rating: High

Market Penetration: More than 50% of target audience

Maturity: Mature mainstream

Definition

Cloud content services are a set of services and microservices used to fulfill content-centric use cases across diverse content types: documents, files, images, and video. In the past, document management and enterprise content management systems were implemented as monolithic, on-premises systems, and often proved difficult to extend and adapt to business needs. Cloud content services have the potential to simplify deployment, shorten development cycles and provide greater ongoing flexibility.

Why This Is Important

Cloud content services are employee-centric content services platforms (CSPs) delivered as either SaaS or PaaS offerings. They are either the evolution of established content services platforms or new offerings designed specifically for the cloud. They are growing in popularity as organizations seek to provide modern, collaboration-centric ways of working with content, and look to avoid the infrastructure management and upgrade cycles of previous implementations.

Business Impact

CSPs are a key component of the digital workplace. Cloud content services solutions have the same capabilities, and are simpler to deploy, implement and address the three major business initiatives:

- Increasing employee digital dexterity by provisioning services that support the digital workplace
- Supporting digital business transformation through the ability to develop new applications
- Supporting the requirements of information governance

Drivers

- Microsoft 365 has accelerated market demand for cloud content services. The more long-standing vendors are starting to rearchitect their on-premises products to the cloud, yet current versions are provider-managed virtual private PaaS, with varying degrees of success. Newer offerings, without the restriction of legacy architectures, tend to be public PaaS.
- Adoption of cloud content services as specialized for specific roles, is more advanced. Specialized applications of cloud content services in spaces like contract life cycle management, legal documents and employee documents have also been growing. We are even seeing adoption in traditionally conservative applications such as regulatory pharm, as evident in the SaaS-regulated enterprise data management suite (EDMS) space.

Obstacles

- Complexities around upgrades, migration and functional limitations within the cloud environments have limited broader enterprise adoption of cloud content collaboration. So organizations also express concern in storing large volumes of machine generated content in the cloud.
- Where vendors are addressing this as virtual private PaaS, upgrade costs can be additional lump sums as newer versions of the product are released. These costs along with others appear as operations charges which may be significantly higher when compared to public PaaS where this is included.
- Change management can be a challenge for organizations selecting public cloud platforms as the vendor controls the release and update cycle. Organizations should assess vendors' capabilities to manage this challenge with sandbox environments and acceptance mechanisms for when the change is deployed and the flexibility in release schedules.

User Recommendations

- Address the business problems and the expected outcomes. The user experience and speed with which a vendor can address a particular problem are differentiating factors. Often, there are specific integrations or prebuilt solutions that can aid productivity and make a substantive difference to the evaluation and choices.
- Develop an operational model that suits the way your business works. Many vendors offer provider-managed virtual private PaaS, which can be a good fit where there is a large degree of sensitivity about the data and processes concerned.

- Conceive an open API framework that provides for customization and support microservices. Cloud content services solutions provide a quick way to improve user experiences, so they are a good fit for organizations looking to continually modernize.

Sample Vendors

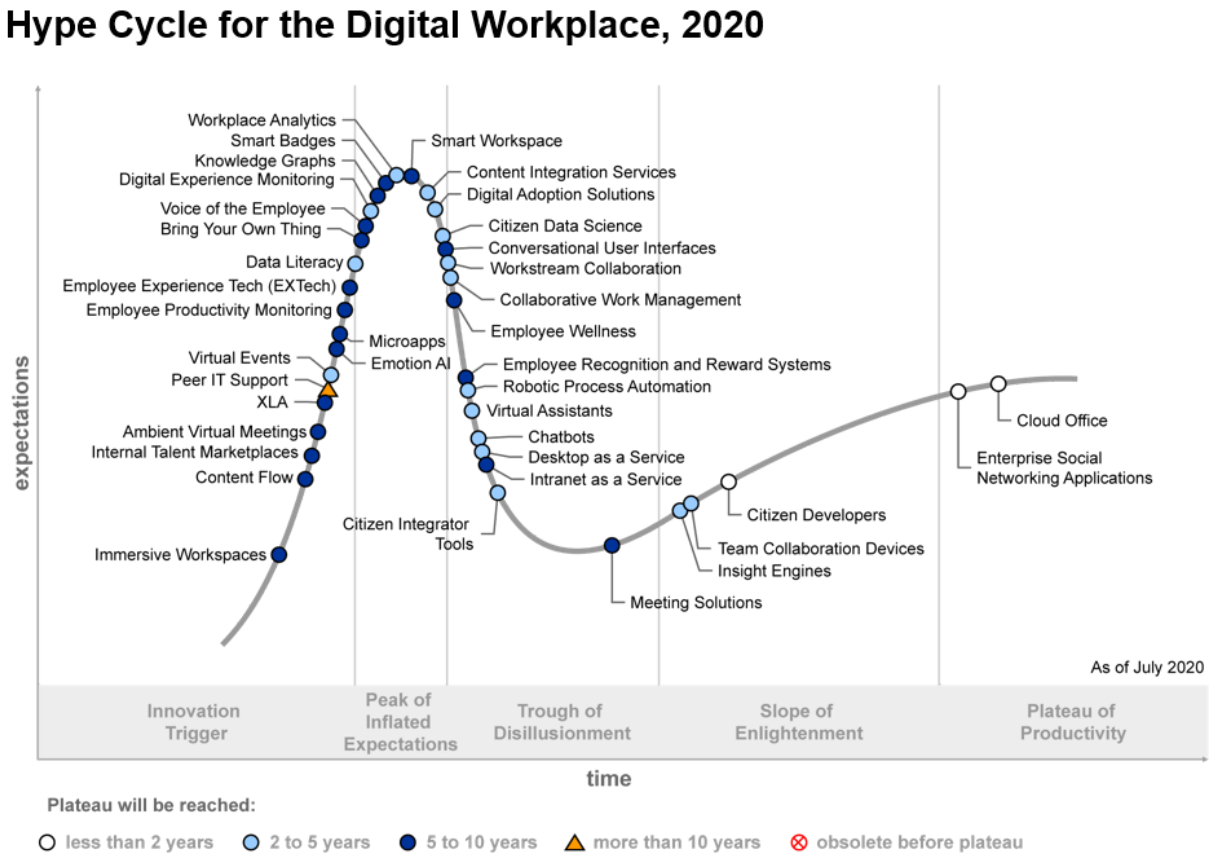
Box; Hyland; iManage; Microsoft; NetDocuments; OpenText

Gartner Recommended Reading

Magic Quadrant for Content Services PlatformsCritical Capabilities for Content Services Platforms

Appendixes

Figure 2: Hype Cycle for the Digital Workplace, 2020



Source: Gartner
ID: 447991

Gartner

Hype Cycle Phases, Benefit Ratings and Maturity Levels

Table 2: Hype Cycle Phases

(Enlarged table in Appendix)

Phase ↓	Definition ↓
Innovation Trigger	A breakthrough, public demonstration, product launch or other event generates significant media 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 innovation is pushed to its limits. The only enterprises making money are conference organizers and content publishers.
Trough of Disillusionment	Because the innovation does not live up to its overinflated expectations, it rapidly becomes unfashionable. Media interest wanes, except for a few cautionary tales.
Slope of Enlightenment	Focused experimentation and solid hard work by an increasingly diverse range of organizations lead to a true understanding of the innovation's applicability, risks and benefits. Commercial off-the-shelf methodologies and tools ease the development process.
Plateau of Productivity	The real-world benefits of the innovation 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.
Years to Mainstream Adoption	The time required for the innovation to reach the Plateau of Productivity.

Source: Gartner (July 2021)

Table 3: Benefit Ratings

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

Source: Gartner (July 2021)

Table 4: Maturity Levels

(Enlarged table in Appendix)

Maturity Levels	Status	Products/Vendors
Embryonic	In labs	None
Emerging	Commercialization by vendors Pilots and deployments by industry leaders	First generation High price Much customization
Adolescent	Maturing technology capabilities and process understanding Uptake beyond early adopters	Second generation Less customization
Early mainstream	Proven technology Vendors, technology and adoption rapidly evolving	Third generation More out-of-box methodologies
Mature mainstream	Robust technology Not much evolution in vendors or technology	Several dominant vendors
Legacy	Not appropriate for new developments Cost of migration constrains replacement	Maintenance revenue focus
Obsolete	Rarely used	Used/resale market only

Source: Gartner (July 2021)

Document Revision History

Hype Cycle for the Digital Workplace, 2020 - 17 July 2020

Hype Cycle for the Digital Workplace, 2019 - 23 July 2019

Hype Cycle for the Digital Workplace, 2018 - 18 July 2018

Hype Cycle for the Digital Workplace, 2017 - 26 July 2017

Hype Cycle for the Digital Workplace, 2016 - 6 July 2016

Hype Cycle for Digital Workplace, 2015 - 22 July 2015

Hype Cycle for Digital Workplace, 2014 - 29 July 2014

Recommended by the Authors

Some documents may not be available as part of your current Gartner subscription.

Understanding Gartner's Hype Cycles

Learn How Hybrid Working Can Transform the Employee Experience

Build a Pragmatic Content Services Strategy in 3 Steps

How to Keep Remote Employees Connected in the Hybrid Organization

Cool Vendors for Digital Workplace Strategy and Applications

Quick Answer: What Team Guidelines Promote Healthy Hybrid Work?

Create Your Own Hype Cycle With Gartner's Hype Cycle Builder

© 2021 Gartner, Inc. and/or its affiliates. All rights reserved. Gartner is a registered trademark of Gartner, Inc. and its affiliates. This publication may not be reproduced or distributed in any form without Gartner's prior written permission. It consists of the opinions of Gartner's research organization, which should not be construed as statements of fact. While the information contained in this publication has been obtained from sources believed to be reliable, Gartner disclaims all warranties as to the accuracy, completeness or adequacy of such information. Although Gartner research may address legal and financial issues, Gartner does not provide legal or investment advice and its research should not be construed or used as such. Your access and use of this publication are governed by Gartner's Usage Policy. Gartner prides itself on its reputation for independence and objectivity. Its research is produced independently by its research organization without input or influence from any third party. For further information, see "Guiding Principles on Independence and Objectivity."

Table 1: Priority Matrix for the Digital Workplace, 2021

Benefit	Years to Mainstream Adoption			
	Less Than 2 Years	2 - 5 Years	5 - 10 Years	More Than 10 Years
Transformational		Agile Beyond IT Citizen Data Science Conversational User Interfaces Employee Communications Applications IoT Business Solutions New Work Hub Virtual Assistants	Internal Talent Marketplaces Smart Workspaces	
High	Chatbots Citizen Developers Cloud Content Services Virtual Events Workstream Collaboration	Collaborative Work Management Data Literacy Desktop as a Service DEX Digital Adoption Solutions Insight Engines Robotic Process Automation Smart Badges Workplace Analytics	EXTech Guided Attention Immersive Meetings Knowledge Graphs Meeting Solutions XLA	
Moderate		Citizen Integrator Tools	Bring Your Own Thing Microapps	Peer IT Support

		Employee Productivity Monitoring Employee Wellness Intranet as a Service Team Collaboration Devices Visual Collaboration Tools	OKR Applications	
Low			Ambient Virtual Meetings	

Source: Gartner (July 2021)

Table 2: Hype Cycle Phases

Phase	*Definition*
Innovation Trigger	A breakthrough, public demonstration, product launch or other event generates significant media 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 innovation is pushed to its limits. The only enterprises making money are conference organizers and content publishers.
Trough of Disillusionment	Because the innovation does not live up to its overinflated expectations, it rapidly becomes unfashionable. Media interest wanes, except for a few cautionary tales.
Slope of Enlightenment	Focused experimentation and solid hard work by an increasingly diverse range of organizations lead to a true understanding of the innovation's applicability, risks and benefits. Commercial off-the-shelf methodologies and tools ease the development process.
Plateau of Productivity	The real-world benefits of the innovation 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.
Years to Mainstream Adoption	The time required for the innovation to reach the Plateau of Productivity.

Phase ↓	Definition ↓

Source: Gartner (July 2021)

Table 3: Benefit Ratings

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

Source: Gartner (July 2021)

Table 4: Maturity Levels

Maturity Levels ↓	*Status* ↓	*Products/Vendors* ↓
Embryonic	In labs	None
Emerging	Commercialization by vendors Pilots and deployments by industry leaders	First generation High price Much customization
Adolescent	Maturing technology capabilities and process understanding Uptake beyond early adopters	Second generation Less customization
Early mainstream	Proven technology Vendors, technology and adoption rapidly evolving	Third generation More out-of-box methodologies
Mature mainstream	Robust technology Not much evolution in vendors or technology	Several dominant vendors
Legacy	Not appropriate for new developments Cost of migration constrains replacement	Maintenance revenue focus
Obsolete	Rarely used	Used/resale market only

Source: Gartner (July 2021)