Hype Cycle for the Future of Enterprise Applications, 2023

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By Analyst(s): Patrick Connaughton, Tad Travis, Mark O'Neill, Kevin Matheny, Stephen Emmott

Initiatives: Enterprise Applications Strategy; Enterprise Applications Evaluation and Selection

> Enterprise application leaders should use this Hype Cycle to identify and prioritize foundational technologies and innovations that are key to delivering a transformative portfolio strategy.

Additional Perspectives

- 未来のエンタプライズ・アプリケーションのハイプ・サイクル：2023年 (19 October 2023)

Analysis

What You Need to Know

To deliver on digital transformation, organizations need applications that can be readily assembled, reassembled and extended. IT and professional developers are not the only drivers of technological innovations. Business technologists, such as citizen developers and citizen data scientists, deliver business automation through a variety of innovative and transformational technologies.

Enterprise application leaders work endless hours delivering technology that is both robust and flexible to meet current and future demands, yet users clamor for intuitive user experiences, more flexibility in where work is done and self-service intelligent analytics. New technologies are forthcoming that will meet these demands.

The Hype Cycle

This Hype Cycle has been created with a strong emphasis on the early-stage, sometimes embryonic, technologies that enterprise application leaders should be paying attention to. As a result, all of the technologies are at the Innovation Trigger, Peak of Inflated Expectations and Trough of Disillusionment stages. None has reached the Slope of Enlightenment or Plateau of Productivity yet.

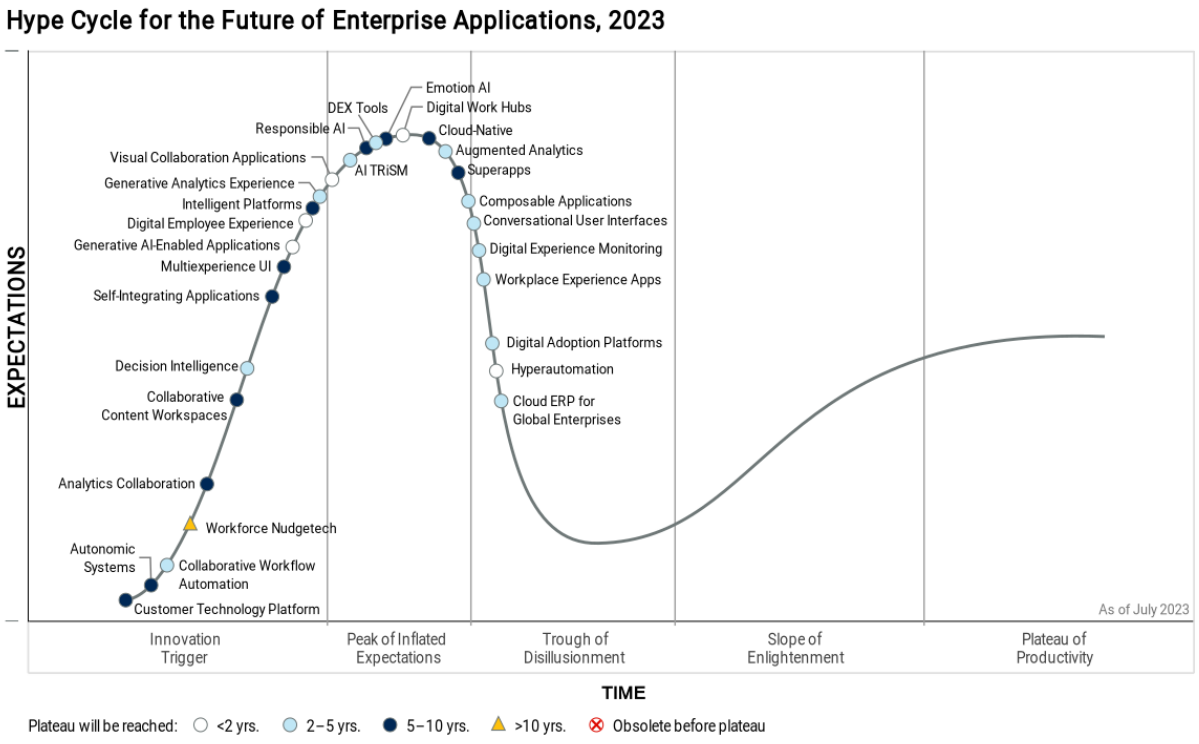
The research is designed to provide a starting point for:

- Partnering with the enterprise architect to establish secure, stable and scalable **digital foundations**. The digital foundation empowers developers, business technologists and fusion teams to create solutions in architecturally sound and secure ways (see Infographic: The Evolving Digital Foundation). This work includes setting the organization's guiding principles for enabling composable applications, building superapps, deploying cloud-native solutions and scaling for hyperautomation. It also includes creating strategic principles of AI trust, risk and security management (AI TRiSM).
- Reinventing the **digital employee experience** to drive higher levels of adoption and business value. This includes investing in new and emerging digital workplace technologies like collaborative workflow automation, workplace experience apps and workforce "nudgetech." It also includes developing a strategy on how the application teams will apply concepts like digital work hubs.
- Scouting emerging technologies and creating a point of view on how these solutions could be assembled to create more **intelligent applications**. Intelligent applications include AI-embedded capabilities by default, enabling continuous learning for a more adaptive contextual user experience. This will be shaped by not just one but a collection of technologies ranging from generative AI to autonomic systems and augmented analytics.

Notable changes from last year:

- Generative AI-enabled applications, generative analytics experience, AI TRiSM, intelligent platforms, augmented analytics, autonomic systems, digital employee experience (DEX) tools, workplace experience apps, digital work hubs, visual collaboration applications, emotion AI, and workforce nudgetech were added.
- Virtual assistants, application portfolio management, cloud marketplaces, data fabric, design thinking, digital twin, event stream processing, self-service data and analytics, cloud migration, Web3, and decentralized applications were removed. But they are still covered in other Gartner Hype Cycles.
- Assemble your own app was renamed collaborative content workspaces.
- Intelligent applications was removed as its own stand-alone dot as Gartner is now defining it as a broad collection of many different types of technologies spanning different maturity levels.

Figure 1: Hype Cycle for the Future of Enterprise Applications, 2023



The Priority Matrix

The Priority Matrix shows the relative impact of innovations on the future of applications. It combines the potential benefit of an innovation on the vertical axis and the years-to-plateau rating on the horizontal axis. Application leaders can use this information for internal planning and the prioritization of emerging innovations.

Most innovations for the future of applications have great potential, with a transformational or high benefit. No transformational innovations are expected to become mainstream within two years; most are expected to be mainstream within two to five years. This means that there is still time to develop strategic plans and evaluate the impacts of these technologies on your organization.

Table 1: Priority Matrix for the Future of Applications, 2023

(Enlarged table in Appendix)

Benefit	*Years to Mainstream Adoption*			
↓	*Less Than 2 Years* ↓	*2 - 5 Years* ↓	*5 - 10 Years* ↓	*More Than 10 Years* ↓
Transformational	Digital Employee Experience Hyperautomation	Collaborative Workflow Automation Conversational User Interfaces Decision Intelligence Workplace Experience Apps	Autonomic Systems Customer Technology Platform Emotion AI Responsible AI Self-Integrating Applications	
High	Digital Work Hubs Generative AI-Enabled Applications Visual Collaboration Applications	AI TRiSM Augmented Analytics Cloud ERP for Global Enterprises Composable Applications DEX Tools Digital Adoption Platforms Digital Experience Monitoring Generative Analytics Experience	Cloud-Native Collaborative Content Workspaces Intelligent Platforms Superapps	Workforce Nudgetech
Moderate			Analytics Collaboration Multiexperience UI	
Low				

Source: Gartner (July 2023)

On the Rise

Customer Technology Platform

Analysis By: Gene Alvarez, Andrew Gianni, Saul Brand, Mike Lowndes

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Embryonic

Definition:

The customer technology platform (CTP) is the integration of all customer-facing technology and applications into a platform. This platform aligns the customer's "outside in" view of the organization's customer experience with the "inside out" delivery of the organization's CX vision, strategy and technology. This platform enables an organization to support a holistic and complete view of the customer experience that benefits both the customer and the organization.

Why This Is Important

The customer technology platform is created by using business capabilities and technology reference models. These models will enable organizations to:

- Build a bridge from their CX CORE objectives to the delivery of their CRM strategy.
- Determine which systems need to work with each other to support the delivery of the organization's CX and CRM strategy in order to create positive customer sentiment.
- Determine how to make improvements to their CRM systems in order to move the organization toward a CTP platform.

Business Impact

Digitalization of the customer experience has exposed process gaps and disconnected customer-facing processes to customers. This is due to CRM applications that were implemented solely to automate individual processes. Application leaders need to address these gaps by viewing CRM applications in the context of CX-centric application strategy that goes beyond CRM. Using a CTP approach to CRM applications can resolve these customer-facing gaps and lead to improved customer experiences.

Drivers

- Delivery of positive customer experience as a part of digital transformation is a key differentiator for any organization.
- Digital transformation of customer-facing processes has exposed disconnected CRM applications, leaving the customer to be the coordinator of their experience across an organization's points of interaction (POIs). Examples of POIs are call centers, chatbots, websites, mobile applications, stores and branches.
- Organizations seeking to scale their customer experience capabilities are using more customer-facing technologies and applications. These organizations want to provide a relevant and integrated customer experience that is intelligently coordinated across all POIs.
- Organizations seeking to provide integrated experiences such as "campaign to contract" know they need to integrate applications (such as campaign management, lead management, salesforce automation and configure, price and quote) to enable intelligent coordinated experiences across all POIs.

Obstacles

- Major investments in CRM applications that are already live and operational in organizations are making it hard to integrate CRM applications into great customer experiences.
- It can be difficult to determine how to integrate CRM applications with the organization's entire IT portfolio.
- Investment in strategic vendor relationships has made the integration of many CRM applications a requirement that vendors must support. However, organizations may not be able to wait until then, due to a need to improve their customer experiences today.
- Customer dissatisfaction or frustration can come from organizational inertia. Customers are exposed to new ways of doing things from competitors or organizations in other industries, and they view the organization as behind in helping customers with their "job to be done." This organizational inertia can come from a variety of sources, such as a mindset that change is a risk rather than a tool that can be used to improve the customer's experience.

User Recommendations

- Use Gartner's CX CORE approach to first build the organization's business capability model. This model will determine what business capabilities are needed to support the integration of an organization's business model and its operating model.
- Avoid misalignment of CRM applications and technology and the organization's business model (for example, using self-check-out in a luxury store environment). This approach will ensure that the organization's CRM applications and technology are properly aligned with its CX objectives.
- Use an architecture that includes business capability and technical reference models to identify which key CRM applications and other technology needs to be intelligently coordinated within the CTP to deliver the right customer experience.
- Use an architecture that includes business capability and technical reference models to determine what needs to be changed when the organization faces a customer experience disruption in its market from competitors.
- Use a CX-CORE-driven approach to design customer experiences. Couple this with using a CTP architectural approach to ensure that all CRM applications and technology are aligned to the organization's CX objectives.

Gartner Recommended Reading

Enable Great Customer Experiences Using Gartner's Customer Experience CORE Model

Drive Your Customer Experience With a CTP Reference Architecture Model

Improve CX With a Customer Technology Platform Reference Architecture Model

Video: How to Build Your Customer Technology Model

Quick Answer: How to Get Started With the CTP Reference Architecture Model for CX CORE

Autonomic Systems

Analysis By: Erick Brethenoux, Nick Jones, David Cearley

Benefit Rating: Transformational

Market Penetration: Less than 1% of target audience

Maturity: Embryonic

Definition:

Autonomic systems are self-managing physical or software systems, performing domain-bounded tasks, that exhibit three fundamental characteristics: autonomy (execute their own decisions and tasks autonomously without external assistance); learning (modify their behavior and internal operations based on experience, changing conditions or goals); agency (have a sense of their own internal state and purpose that guides how and what they learn and enables them to act independently).

Why This Is Important

Autonomic systems are emerging as an important trend as they enable levels of business adaptability, flexibility and agility that can't be achieved with traditional AI techniques alone. Their flexibility is valuable in situations where the operating environment is unknown or unpredictable, and real-time monitoring and control aren't practical. Their learning ability is valuable in situations where a task can be learned even though there is no well-understood algorithm to implement it.

Business Impact

Autonomic systems excel where:

- Conventional automation applying composite AI techniques is inadequate, or using fixed training data is impractical or not agile.
- It is impractical to provide real-time human guidance, or training conditions can't be anticipated.
- We cannot program the exact learning algorithm, but the task is continuously learnable.
- Continuously or rapidly changing tasks or environments make frequent retraining and testing of ML systems too slow or costly.

Drivers

Autonomic systems are the culmination of a three-part trend:

- Automated systems are a very mature concept. They perform well-defined tasks and have fixed deterministic behavior (e.g., an assembly robot welding cars). The Increasing number of use cases around automation using AI techniques is a strong base for autonomous systems.
- Autonomous systems go beyond simple automation to add independent behavior. They may exhibit some degree of adaptive behavior, but are predominantly under algorithmic control (e.g., self-driving cars or a Boston Dynamics' Spot robot 1 that has its overall route and goals set by a remote human operator but has substantial local autonomy over how it achieves them). Adaptive AI capabilities are a necessary foundation for autonomic systems and should accelerate the adoption of autonomic systems.
- Autonomic systems exhibit adaptive behavior through learning and self-modifying algorithms (e.g., Ericsson has demonstrated the use of reinforcement learning and digital twins to create an autonomic system that dynamically optimizes 5G network performance. It learns from network behavior and local conditions and adjusts software and physical network control parameters to optimize performance). This trend is showing the feasibility of such systems and early learning about carefully bounded autonomic systems will build trust in their capabilities to operate independently.

Longer-term drivers include:

- Autonomic behavior is a spectrum. For example, chatbots learn from internet discussions; streaming services learn which content you like; delivery robots share information about paths and obstructions to optimize fleet routes. The advantages of systems that can learn and adapt their behavior will be compelling, and many examples will involve physical devices.
- Substantial academic research is underway on autonomics, which will result in more widespread use.

Obstacles

- **Nondeterminism:** Systems that continuously learn and adapt their behavior aren't predictable. This will pose challenges for employees and customers who may not understand how and why a system performed as it did.
- **Immaturity:** Skills in the area will be lacking until autonomics becomes more mainstream. New types of professional services may be required.
- **Social concerns:** Misbehavior, nondeterminism or lack of understanding could generate public resistance when systems interact with people.
- **Digital ethics and safety:** Autonomic systems will require architectures and guardrails to prevent them from learning undesirable, dangerous, unethical or even illegal behavior when no human is validating the system.
- **Legal liability:** It may be difficult for the supplier of an autonomic system to take total responsibility for its behavior because that will depend on the goals it has set, its operating conditions and what it learned.

User Recommendations

- Start by building experience with autonomous systems first to understand the constraints and requirements (legal, technical and cultural) that the organization is subjected to. Pilot autonomic technologies in cases where early adoption will deliver agility and performance benefits in software or physical systems.
- Manage risk in autonomic system deployments by analyzing the business, legal and ethical consequences of deploying autonomic systems — which are partially nondeterministic. Do so by creating a multidisciplinary task force.
- Optimize the benefits of autonomic technologies by piloting them in situations, such as complex and rapidly changing environments where early adoption will deliver agility and performance benefits in either software or physical systems.

Sample Vendors

Adapdix; IBM; Latent AI; Playtika; Vanti

Gartner Recommended Reading

Top Strategic Technology Trends for 2022: Autonomic Systems

Collaborative Workflow Automation

Analysis By: Mike Gotta, Jason Wong

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Embryonic

Definition:

Collaborative workflow automation (CWA) integrates digital workplace applications with CRM or operational applications into a conversational, task-centric work hub. CWA targets nonroutine work, bringing together multiple collaboration tactics to expedite problem solving, work handling, and decision making. CWA leverages graphs, analytics and AI to promote decision intelligence. Low-code/no-code capabilities empower teams to customize their own work environment.

Why This Is Important

CWA helps employees manage nonroutine collaboration within and across teams under highly dynamic situations, which depend on rapid decision making and fluid work coordination. CWA fills a gap between free-form collaboration and role-based apps. It enables teams to customize and extend their work hub themselves. It also leverages decision intelligence, action framework capabilities, generative AI, knowledge and work graphs to automate fragments of people-driven collaborative work.

Business Impact

CWA enables organizations to shift digital workplace applications beyond free-form productivity to more focused, intentional productivity within process and operational work scenarios. It encourages teams to exploit their own mastery and autonomy to perform at the higher level, both individually and collectively with their cohorts. Such experiences contribute to great staff engagement and retention. CWA helps teams make better decisions that contribute to total experience needs.

Drivers

- Workstream collaboration market evolution: CWA is a solution pattern for workstream collaboration (WCS) vendors trying to tackle more complex work scenarios involving operations, processes and frontline workers. The WCS market for everyday productivity use cases is largely “well-settled,” motivating vendors to move beyond everyday productivity to expand business models and align with higher customer expectations.
- Hybrid and remote work: Decentralized work coordination presents challenges for teams to “get on the same page,” make decisions, balance workloads and optimize work-handling activities. CWA tools straddle the free-form use of productivity tools and the structure of collaborative work management tools. It is a type of digital workplace work hub that is designed to focus on more process-centric, operational use cases that entail customer-facing work or “back-office” work.
- Expanded use of digital workplace applications: Sixty-eight percent of enterprise application leaders are more focused on improving business outcomes, while 66% are focused on improving process design, and 59% on reducing costs. CWA provides an opportunity for digital workplace leaders to align with application leader needs, expanding the digital workplace charter as a result.
- Business-led technology decisions: Business technologists, citizen developers and fusion teams all have a great impact on technology selection and delivery. CWA provides a technology baseline, such as low-code/no-code, that supports the goals of IT leaders to stand up intelligent applications with embedded AI, while promoting high levels of customization and augmentation by end users themselves.

Obstacles

- Technology risk: CWA is a work-in-progress with no vendors having a complete solution. Most vendors need to build out a dynamic work coordination that embeds real-time decision intelligence. CWA may overlap with WCS vendors that are already deployed.
- Business sponsors: CWA focus is on functional areas that cut across sales, marketing, service or other business units. This can challenge business case development resourcing if multiple sponsors need consensus.
- Lack of proof: CWA is an emergent technology that does not have a track record within the organization. Absence of experience or public testimonial can make CWA more relevant to innovation teams, fusion teams and business technologists. But vendors may not have a means to connect with these influencers and decision makers,
- Culture and skills: CWA represents a highly dynamic way of collaborating, requiring team leaders and members to work in new ways. It may take time to develop intentional collaboration practices.

User Recommendations

- Identify use cases: Look for activities where nonroutine work is more common, such as higher exception handling, delayed customer deliveries, poor quality or other indicators that suggest poor decision making or cross-functional collaboration. Work with business leaders to refine those use cases to see if they align with what CWA could improve on.
- Start small and iterate: Lack of maturity and completeness means that efforts should progress in an iterative learn-and-expand mode with the opportunity to fail-safe. Focus efforts where sponsors are aware of risks as well as value. Establish roles, and support structures and governance principles to ensure consistency, quality, and best-practice diffusion.
- Address governance issues: CWA creates a dynamic technology orchestration across different types of applications and developer audiences, such as business technologists. Getting the proper governance framework that works with the business and IT culture is crucial.

Sample Vendors

Alibaba Group; Coolfire; Mattermost; Salesforce (Slack Technologies); Symphony Communication Services

Gartner Recommended Reading

Innovation Insight for Collaborative Workflow Automation

Market Guide for Collaborative Work Management

Quick Answer: How Can Digital Workplace Leaders Support Business Technologists?

Analytics Collaboration

Analysis By: Julian Sun, David Pidsley, Anirudh Ganeshan

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Embryonic

Definition:

Analytics collaboration is the application of collaborative capabilities to analytics workstreams for organizations that want to provide an environment where users can simultaneously co-produce an analytics project, product or program, advancing from individually oriented to community-centric data and analytics (D&A).

Why This Is Important

Collecting diverse perspectives on D&A to establish a cohesive understanding is critical for complex decision making. Collaborative decision making adds context to create a shared, holistic view of the relevant information. This is also true of network effects from collaboration — where the utility that any one user derives from an analytics and business intelligence (A&BI) platform depends on the number of users. Otherwise analytics outputs fail to deliver insights with context to business processes and decision makers on time.

Business Impact

Analytics collaboration is a stepping stone to building a new style of collaborative decision making, which is decision-centric rather than just data-driven. Analytics collaboration within the team puts emphasis on communication and action, enabling the propagation of business value throughout the decision network. Organizations can enable higher employee adoption that delivers more value from their role in decision making and ROI from projects. Using collaboration in analytics can improve employee experiences and further drive data literacy.

Drivers

- Decision making has become increasingly complex with more people within the organization involved in each decision. According to the 2021 Gartner Analytics Consumerization-Democratization Survey, 55% of organizations are using hybrid (fusion team) as the most prevalent model for A&BI. This involves people from different domains collaborating on D&A in the same environment with a more consistent process from data to impact.
- Analytics collaboration is enabled by integration with digital workplace applications such as Microsoft Teams or Slack and software repository hosting manager tools such as GitLab or GitHub. For A&BI platforms, collaboration is becoming a capability that supports a collaborative community ecosystem where users annotate and socialize analytics content in a native social-media-like experience.
- Diverse business users expect their analytics to be on the same virtual canvas where they already collaborate in real time. The analysis is today embedded in conferencing and live discussion. A multipersona environment where people can contribute based on domain knowledge, not just analytical proficiency is expected.

Obstacles

- Analytics is a powerful tool that can be used for decision support, but it is only as good as the people and teams who use it. In order to get the most out of A&BI, organizations struggle to create a culture of collaboration where people are encouraged to share ideas and insights.
- Organizations usually have more than one A&BI platform as an enterprise standard, and collaboration using different tools requires more workflow management than is normally designed between tools.
- Collaboration itself is hard in organizations, and for D&A activities, collaboration sometimes starts with a data quality issue.
- One of the biggest challenges to collaboration is the lack of a common business language. Different teams and departments often use different terms and definitions, which can make it difficult to communicate effectively. This can be addressed by creating a glossary of terms and by providing training on data literacy.

User Recommendations

- Orchestrate teamwork for analytics by exploring the emerging collaborative capabilities of A&BI platforms and digital workplace applications for multipersona collaboration across technology application silos and business functions.
- Transform data and analytics into business insights and action by implementing the integration between A&BI platforms and workstream collaboration applications.
- Improve analytics content delivery with an agile, iterative process by bridging the D&A team with the software engineering practice.

Sample Vendors

atoti; Coginiti; Deepnote; Domo; Einblick Analytics; Hex Technologies

Gartner Recommended Reading

Innovation Insight: Analytics Collaboration

Market Guide for Augmented Analytics

Market Guide for Embedded Analytics

Critical Capabilities for Analytics and Business Intelligence Platforms

Workforce Nudgetech

Analysis By: Rania Stewart

Benefit Rating: High

Market Penetration: Less than 1% of target audience

Maturity: Embryonic

Definition:

Workforce nudge technology (nudgetech) is a form of AI-enabled choice architecture designed to elicit behaviors aimed at accelerating targeted positive outcomes at the individual, team and/or organizational level. Nudgetech incorporates behavioral economic principles, hyperpersonalized through AI. Nudges come with the freedom of choice and are often based on worker behavior data, including workstyle analytics.

Why This Is Important

Nudgetech can be transformative in its potential to enable high-impact behavioral change, often with low-effort investment by the individual. Nudgetech is seeing traction in leading-edge people development, personal productivity and employee experience applications. Use-case relevancy continues to grow and expand, particularly where desired behaviors are not immediate or certain (requiring greater interpretation, judgment and agency of choice, hence benefiting from nudge guidance).

Business Impact

Nudgetech uses technology to drive small, beneficial changes that are good for employees, managers and the organization. These small changes are designed to effectively compound to scale toward a greater impact on the desired behavioral outcome. And yet these outcomes can be positive, net neutral or even inadvertently negative. Without AI-enabled feedback loops, nudges can backfire and become mass-scale “sludge,” deterring progress.

Drivers

- Personalized guidance is invaluable to change, learning and improvement initiatives at every level (individual, team, department, organization). It is simultaneously difficult to scale, due to the combination of required subject matter expertise and contextual knowledge required of the individual and their team/organization.
- The 2022 Gartner Digital Worker Experience Survey found that 26% of workers consider themselves to be either novice or have developing knowledge of the digital technology used for work. Fifty-five percent of these workers struggle to find information or data needed to do their job and 43% admit to having made the wrong decisions due to lack of awareness.
- This scalability challenge drives the value proposition of nudgetech to close the behavioral gap from where you are today to where you ideally want to be tomorrow. The most concentrated workforce-targeted use-case applications observed to date include enabling the following outcomes — agile culture and adaptive teams, inclusion and belonging, manager and leader effectiveness, proficiency with digital tools, security-conscious culture, and well-being and personal effectiveness.

Obstacles

- **Lack of definition:** Nudgetech is not yet sufficiently far along to have a commonly accepted definition.
- **Filter the nudge noise:** A nudge is not a reminder or a notification by itself. Those are common delivery mechanisms that are often, understandably, referred to as "nudges," but lack the systematic rigor of nudge technology.
- **Is it really AI-enabled?:** This can be difficult to uncover, in that the behavioral economics of nudge technology will likely present as more static, decision-tree logic. This should be complemented by AI-driven feedback loops, where the system learns which nudges work better for which people (completion rates) and outcomes (impact tracking).
- **"Sludge" vs. nudge:** Employees may develop "nudge fatigue" from too many nudges or ineffectual or inappropriate nudges that ultimately deter progress.
- **Choice is key:** If there's no option to pass, it is not a nudge, but rather a prescriptive action, which is less effective at sustainable behavioral change.

User Recommendations

- **Prioritize which organizational outcomes may benefit the most from nudge technology.** The ideal fit would be an outcome theme that enables you to start small, with easy but potentially high-impact outcomes (see Create Self-Sustaining Culture Hacks by Applying Nudging Techniques).
- **Experiment selectively with isolated proofs of concept within your own organization.** Depending on available in-house skills and expertise, it may be an option to pursue this as an internal build. Many larger organizations have the requisite data science capability. If yours does not, consider contracting with an organizational psychologist or related firm to create the nudge library.
- **Encourage bidirectional discussions with prospective or existing vendors.** How do you encourage select prospective vendors (or even current ones) to consider the pros and cons of investing in nudgetech? You ask them. You put it on their radar. You encourage bidirectional discussions.

Sample Vendors

Beamery; BetterUp; Digital Attitude; Humu; Perceptyx (Cultivate); Workday (Peakon)

Gartner Recommended Reading

Establish a Security-Conscious Culture Using Behavioral Economics

How to Use Behavioral Economics to Drive Adoption and Save Money in Your Organization

Collaborative Content Workspaces

Analysis By: Joe Mariano, Jason Wong, Larry Cannell

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

Collaborative content workspaces (CCWs) enable employees to connect live components such as lists, text blocks, and data fields to achieve their personal, team, and line of business goals. These workspaces can be either temporary or permanent, depending on the need. With real-time co-editing, any changes made are promptly reflected on the canvas, fostering a dynamic and flexible collaborative workspace experience with highly effective content organization.

Why This Is Important

CCW offers an innovative approach to no-code citizen automation and development and alternative to low-code development tools that could be overkill. CCW allows citizen developers to design report dashboards, automation, and collaboration areas in a well-defined environment. By integrating data and features from other technologies, CCW reduces the need for context switching. As a result, CCW boosts digital employees' experience and accuracy, resulting in better business outcomes.

Business Impact

Live, co-editable and online collaborative components, such as task lists, charts or online documents allow teams of virtually any size to organize, coordinate and track their efforts. CCW is a shared resource from conception and requires a different mindset from staff. This goes away with CCW and it is now owned at a group level. Business use cases include team collaboration, user-built custom workflows, flexible data gathering (e.g., departmental OKR tracking), wikis and knowledge bases.

Drivers

- Employees are constantly seeking out new technologies that meet critical business needs. A third of the participants in Garter's Digital Worker Survey are acquiring apps with and without IT support. Potentially, CCW tools can supplement the need for new technology in favor of combining data and integrating with other services to create a new tool to meet personal, group and line of business needs.
- Microsoft's introduction of their CCW, Loop, as a future model of collaboration will drive major interest in this technology space, which is very different from traditional tools such as content services and workstream collaboration.
- Rising workforce digital dexterity is empowering and inspiring tech-savvy employees to develop technology competencies they can share with the team (what we sometimes refer to as a "digital side hustle"). CCWs enable employees to apply their skills to shape workspaces to meet their specific needs.
- Gartner's 2022 Digital Worker Survey data shows 47% of participants struggled to find the information or data needed to do their job. CCW has the potential to provide real-time data and content delivery in appropriate business contexts across many channels, combined with application logic that can be easily adapted to changing needs. This enables employees to keep up with the accelerating pace of business. Data fields from diverse applications can be treated as objects in a CCW. This can allow for more dynamic search on more elements of content within CCWs.

Obstacles

- Since this market is emerging, functionality is not consistent from vendor to vendor. Security and governance features, collaboration features and content creation and ownership are not standardized. This can cause confusion when comparing vendors.
- CCW tools require a different mindset from staff as well as the time needed to understand valid use cases and train staff on how to use them.
- CCW represents potentially deploying yet another digital workplace tool. Employees may face some form of "digital burnout," with most employees needing to get used to this form of other tools.
- Consider that investing in any CCW tool will cause some level of locking, as migration services to move from one to the other do not exist at this time.
- Entrenched work patterns — shaped through decades of emailing document attachments and scheduling meetings in order to collaborate — are difficult to alter and may not be recognized as a problem by users.

User Recommendations

- Connect with influencers and innovative users, some of whom may already be using CCWs. Find, prepare, and learn from influencers around your company, especially those who are frustrated with existing toolsets and are willing to encourage their colleagues to consider alternatives.
- Educate stakeholders about how the collaboration tool market is changing. By bypassing traditional collaboration patterns CCWs will increase competition among tool vendors, bringing with them new options and innovations. Work with governance teams and senior IT leaders to educate them on CCW tools and opportunities to pave the way for potential pilots.
- Make plans to experiment, as vendors such as Google and Microsoft will increasingly add CCW capabilities. Ensure that workers understand the benefits of composability and see early promises with an @mention, or an information card displayed upon hovering on a word or phrase.

Sample Vendors

ClickUp; Google Workspace; Microsoft Loop; monday.com; Notion; Salesforce (Slack)

Gartner Recommended Reading

Quick Answer: Who's Who in the Life Cycle of Composable Applications?

Becoming Composable: A Gartner Trend Insight Report

Decision Intelligence

Analysis By: Erick Brethenoux

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Definition:

Decision intelligence (DI) is a practical discipline that advances decision making by explicitly understanding and engineering how decisions are made and how outcomes are evaluated, managed and improved via feedback.

Why This Is Important

The current hype around automated decision making and augmented intelligence, fueled by AI techniques in decision making (including generative AI), is pushing DI toward the Peak of Inflated Expectations. Recent crises have revealed the brittleness of business processes. Reengineering those processes to be resilient, adaptable and flexible will require the discipline brought by DI methods and techniques. A fast-emerging market (DI platforms) is starting to provide resilient solutions for decision makers.

Business Impact

Decision intelligence helps:

- **Reduce technical debt and increase visibility.** It improves the impact of business processes by materially enhancing the sustainability of organizations' decision models based on the power of their relevance and the quality of their transparency, making decisions more transparent and auditable.
- **Reduce the unpredictability of decision outcomes.** It does so by properly capturing and accounting for the uncertain factors in the business context and making decision models more resilient.

Drivers

- **A dynamic and complex business environment, with an increasingly unpredictable and uncertain pace of business.** Two forces are creating a new market around decision intelligence platforms (DIPs). The first is the combination of AI techniques such as natural language processing, knowledge graphs and machine learning. The second is the confluence of several technology clusters around composite AI, smart business processes, insight engines, decision management and advanced personalization platforms.
- **The need to curtail unstructured, ad hoc decisions that are siloed and disjointed.** Often uncoordinated, such decisions promote local optimizations at the expense of global efficiency. This phenomenon happens from both an IT and a business perspective.
- **Expanding collaboration between humans and machines.** This collaboration, supplemented by a lack of trust in technologies (such as AI), is increasingly replacing tasks and promoting uneasiness from a human perspective. DI practices promote transparency, interpretability, fairness, reliability and accountability of decision models critical for the adoption of business-differentiating techniques.
- **Tighter regulations that are making risk management more prevalent.** From privacy and ethical guidelines to new laws and government mandates, it is becoming difficult for organizations to fully understand the risk impacts of their decisions. DI enables an explicit representation of decision models, reducing this risk.
- **Uncertainty regarding decision consistency across the organization.** Lack of explicit representation of decisions prevents proper harmonization of collective decision outcomes. DI remedies this issue.
- **Emergence of software tools in the form of decision intelligence platforms.** DIPs will enable organizations to practically implement DI projects and strategies.
- **Generative AI.** The advent of generative AI is accelerating the research and adoption of composite AI models, which are the foundation of DIPs.

Obstacles

- **Fragmentation:** Decision-making silos have created data, competencies and technology clusters that are difficult to reconcile and that could slow down the implementation of decision models.
- **Subpar operational structure:** An inadequate organizational structure around advanced techniques, such as the lack of an AI center of excellence, could impair DI progress.
- **Lack of proper coordination between business units:** The inability to impartially reconsider critical decision flows within and across departments (also because of fragmentation) diminishes the effectiveness of early DI efforts.
- **Lack of modeling in a wider context:** In organizations that have focused almost exclusively on technical skills, the other critical parts of human decision making — psychological, social, economic and organizational factors — have gone unaddressed.
- **Lack of AI literacy:** Many organizations still suffer from a lack of understanding when it comes to AI techniques. This AI illiteracy could slow down the development of DI projects.

User Recommendations

- **Promote the resiliency and sustainability of cross-organizational decisions** by building models using principles aimed at enhancing traceability, replicability, pertinence and trustworthiness.
- **Improve the predictability and alignment of decision agents** by simulating their collective behavior while also estimating their global contribution versus local optimization.
- **Develop staff expertise** in traditional and emerging decision augmentation and decision automation techniques, including predictive and prescriptive (optimization, business rules) analytics. Upskill business analysts, and develop new roles, such as decision engineer and decision steward.
- **Tailor the choice of decision-making technique** to the particular requirements of each decision situation by collaborating with subject matter experts, AI experts and business process analysts.
- **Accelerate the development of DI projects** by encouraging experimentation with generative AI and expediting the deployment of composite AI solutions.

Gartner Recommended Reading

Innovation Insight for Decision Intelligence Platforms

Reengineer Your Decision-Making Processes for More Relevant, Transparent and Resilient Outcomes

How to Choose Your Best-Fit Decision Management Suite Vendor

AI Security: How to Make AI Trustworthy

Top Strategic Technology Trends for 2023: Adaptive AI

Multiexperience UI

Analysis By: David Pidsley

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

A multiexperience user interface (UI) for analytics and business intelligence (ABI) aligns modes of interaction and analytics capabilities, which optimize a user's experience of analytics development and consumption of content for a given decision-making process. The increase in possible combinations of approaches is due to advancements in technologies such as augmented analytics, generative AI, data storytelling, natural language query, virtual reality (VR) and augmented reality (AR).

Why This Is Important

Much like the customized user experiences we are used to in our day-to-day interactions with technology, consumer-oriented analytics experiences are needed to drive adoption of data-driven decisions. Organizations must be able to deliver the most relevant, contextualized and consumable analytics outputs possible. This requires tapping into the unique intersection of various devices, interaction modalities and analytics capabilities that can augment users' ability to consume insights.

Business Impact

Transitioning from static analytics outputs to dynamic contextualized insights, embedded or automated, means analytics are delivered with increased relevance closer to the point of decision. Aligning analytics with an optimal interface and consumption modality will impact the approach to measuring ABI adoption. Quantifying adoption must shift from counting how many users leverage a tool to how many people consult data in making a decision and what pathway of capabilities they use.

Drivers

- Multiexperience is closely coupled to advancements in both hardware, in the form of interfaces such as desktops, mobile devices, wearable devices, virtual reality simulators or smart speakers; and software, in the form of augmented analytics, data storytelling and natural language query capabilities.
- The various modalities in which users can interact with data (chat, click, touch, voice, etc.) are generally accepted, yet organizations are only scratching the surface when it comes to maximizing the cross-section of these interfaces and capabilities. Many organizations are already using embedded forms of analytics as a starting point for multiexperience.
- Because capabilities, such as augmented and automated data storytelling, are almost entirely enabled by cloud-based architectures, adoption will be accelerated proportionate to organizations' movement to cloud-based data and analytics tools.
- AI-powered assistants enabled by generative AI (similar to ChatGPT, Copilot) that vendors make available within (or connect to) ABI platforms have changed the way analytics developers and consumers experience their work. This shifts the focus from drag-and-drop to prompt-and-refine.

Obstacles

- While there is a wide variety of multiexperience UIs available to users, the roles and skills needed to compose these remains a challenge.
- Data and analytics (D&A) resources must learn how to maximize the combination of new interaction modalities and analytics capabilities. The time needed for this will be in direct competition with the time needed for day-to-day analytics requests that many D&A teams are already inundated with.
- While unique best-of-breed user experiences may be ideal, potential buyers may default to using existing ABI platforms that will add augmented capabilities without time-consuming migration, consolidation or additional new investments.
- Automation of decisions, accelerated by the adoption of AI, may lessen the need for humans to create analytic content for decision support. Data literacy may decline as business users transition from analytics consumers to a role where their input simply validates recommended decisions.

User Recommendations

- Account for multiexperience approaches to consuming data by aligning the right analytic capability to the right user interface and experience.
- Evaluate where new consumption mechanisms could add value to decision-making processes, rather than simply lifting and shifting the same traditional analytics outputs to a modern cloud platform.
- Evaluate, on a regular basis, your existing ABI tools and innovative startups to offer new augmented user experiences beyond the predefined dashboard, such as AI-powered coding assistants.
- Place analytics capabilities as close to relevant business decision makers as possible, by evaluating when ABI platform capabilities are best embedded in line with other business applications or workflows.
- Take a data-driven approach to analytics adoption by leveraging the usage data available within today's ABI platforms. If not prebuilt, discuss with vendors the options available to tap into such data.

Sample Vendors

BadVR; D6 VR; Google; SAS; TIBCO Software; Virtualitics

Gartner Recommended Reading

Market Guide for Augmented Analytics

Top Trends in Data and Analytics, 2023

Emerging Technologies: Find Success With Head-Mounted Displays Despite Modest Market Growth Expectations

Cool Vendors in Analytics and Data Science

Multiexperience Will Be the New Normal for Consuming Analytics Content in the Augmented Era

Self-Integrating Applications

Analysis By: Keith Guttridge

Benefit Rating: Transformational

Market Penetration: Less than 1% of target audience

Maturity: Embryonic

Definition:

Self-integrating applications will use a combination of automated service discovery, metadata extraction and mapping, automated process definition, and automated dependency mapping to enable applications and services to integrate themselves into an existing application portfolio with minimal human interaction.

Why This Is Important

Integrating new applications and services into an application portfolio is complex and expensive. Gartner research shows that up to 65% of the cost of implementing a new ERP or CRM system is attributable to integration. The technology for enabling applications to self-integrate exists in pockets, but no vendor has yet combined all the elements successfully. As applications develop the ability to discover and connect to each other, the amount of basic integration work will dramatically reduce.

Business Impact

Self-integrating applications can:

- Improve agility, as the time to onboard applications and services is massively shortened.
- Cut costs by up to 65% when onboarding new applications and services.
- Reduce vendor lock-in, as platform migration becomes simpler.
- Improve the ability to focus on differentiation and transformational initiatives, as the “keeping-the-lights-on” burden is dramatically reduced.

Drivers

- Cloud hyperscalers provide features such as service discovery, metadata extraction, intelligent document processing and natural language processing.
- Automation or integration vendors provide features such as intelligent data mapping, metadata extraction, next-best-action recommendations, process discovery and automated decision making.
- SaaS vendors provide features such as process automation, packaged integration processes, portfolio discovery and platform composability.
- In the new era, intelligent application portfolio management is placed on top of augmented integration platforms in order to properly address the challenge.
- Generative AI simplifies the build process to create integration processes.

Obstacles

- Embedded integration features within SaaS are good enough to enable organizations to get started quickly, thus stalling investment in improving self-integration capabilities.
- Generally, organizations are not well aware of the availability of augmented integration technologies for enabling self-integrating applications. Many organizations still view integration as a complex issue requiring specialist tools.
- There is not a clear market leader that is looking to push this technology forward as the major application vendors look to protect their customer bases.
- Complex scenarios across multiple datasets and service interfaces are too challenging for the current technology. Organizations place too much trust in the solution to do the right thing. Ownership and visibility of the integrations might become contentions within the organizations.

User Recommendations

Software engineering leaders responsible for integration should:

- Ask your major application vendors about the interoperability of applications within their portfolios. This is the area where self-integrating applications are most likely to emerge first.

- Investigate integration vendors that have augmented artificial intelligence features to automate the process of onboarding applications and services into a portfolio.
- Manage your expectations for ease of integration. Self-integrating applications will provide just enough integration with the rest of the application portfolio to enable a new application to work efficiently.
- Keep track of governance capabilities. Who can authorize access? Has the appropriate observability been established? Is everything fully audited? Does something need to change? An organization's integration landscape is an ever-evolving environment, and each integration has a life cycle that needs to be maintained.

Sample Vendors

Boomi; IBM; Microsoft; Oracle; Salesforce; SAP; SnapLogic; Tray.io; Workato

Generative AI-Enabled Applications

Analysis By: Radu Miclaus, Arun Chandrasekaran

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Definition:

Generative AI-enabled applications use generative AI for user experience (UX) and task augmentation to accelerate and assist the completion of a user's desired outcomes. When embedded in the experience, generative AI offers richer contextualization for singular tasks like generating and editing text, code, images and other multimodal output. As an emerging capability, process-aware generative AI agents can be prompted by users to accelerate workflows that tie multiple tasks together.

Why This Is Important

Fast-moving advances in foundation models drive generative AI-enabled applications, which have the potential to democratize the workforce. Since applications can now be enabled with generative AI capabilities that process and provide output in human consumable modalities (text, images, sound, etc.), the use cases will permeate a wide spectrum of domains and skill sets within the knowledge workforce, reimagining how enterprises think of scale and productivity.

Business Impact

Generative AI chatbots/agents/co-pilots within applications will target time-consuming, manual-prone and repetitive tasks, such as knowledge discovery, summarization and contextualization, software engineering and coding, graphic and video design, and workflow design and execution. With these tools at their disposal, knowledge workers and creatives will sustain new learning curves toward innovative ways to scale businesses. Businesses not making use of these tools will struggle to compete.

Drivers

- **Fast advancement of foundation models:** Foundation models like GPT are advancing at an accelerated rate. There is a movement toward democratizing foundation models via open-sourcing variations, such as Meta AI (Large Language Model Meta AI [LLaMa]) or BigScience Large Open-science Open-access Multilingual Language Model (BLOOM).

- **Wider range of applications:** Among others, the most common pattern for generative AI-embedded capabilities today is text-to-X, which democratizes the access for knowledge workers to what used to be specialized tasks via prompt engineering using natural language. For example, **text-to-text** supports knowledge discovery, summarization and contextualization in communication applications across the enterprise. **Text-to-code** is emerging as developer processes get augmented through "pair programming" with AI co-pilots directly into the coding experience, with use cases ranging across the software development life cycle. **Text-to-image/video (image-to-image)** applies when applications from graphics design to video editing and full video generation see generative capabilities added both by traditional technology players as well as new startups. **Text-to-process/workflow** is emerging as generative AI agents enable users to use text and voice to generate workflows and generative tasks together in cohesive domain-specific applications. **Text-to-multimodal** supports the building of high-fidelity avatars, or digital objects that have image, sound and narrative/text modalities, as an example of multimodal application in metaverse and gaming.

- **Domain specialization:** Specialization on top of foundation models is extending into domain-specific refinement, as well as refinement based on internal/private/licensed knowledge bases and process definitions for enterprises.

- **Acceptance into professional life:** Consumers are pulling the generative AI-enabled applications into their professional life.

- **Computation cost optimization:** The computational innovations for training and inference are focusing on optimizing and refining the cost structures across the entire software stack (infrastructure, methodologies and integrations).

Obstacles

- **Security, consumer privacy and enterprise intellectual property (IP) protection concerns:** A large number of inquiries from potential buyers of generative capabilities are concerned with the wide umbrella of trust and security. While large hyperscale vendors and startups are racing to make generative AI services enterprise-ready, in the short- to midterm, there will still be a lack of regulation and appropriate adaptable oversight.
- **Accuracy and veracity of outputs:** Hallucinations and inaccuracy will continue to be a concern for generative AI.
- **Fear around automation and job replacement:** Human nature brings a blend of excitement and fear around widespread adoption.
- **Learning curves and uncertainty:** As generative AI technology evolves, there is confusion about the implementation that is right for enterprises, how quickly the market is evolving and the lack of skills on transformers available in the market.
- **Regulation:** While currently lagging, regulations will follow and may increase the friction in innovation speed and adoption.

User Recommendations

- **Seek technology providers that can offer vertical specialization:** Vendors who will accelerate the refinement and adoption of generative AI capabilities in the context of vertical and business processes of the enterprise should be prioritized in evaluation for existing and future needs.
- **Use enterprise-ready technologies:** For enabling and embedding generative AI in applications, (a hybrid build-and-buy approach), prioritize research into the roadmaps of enterprise-ready generative AI services with a focus on addressing the privacy, security and IP protection needs of the enterprise.
- **Encourage steady growth:** Challenge knowledge workers to engage in new learning curves, and improve or redesign business processes to respond to this disruption.

Sample Vendors

Adobe; AgentGPT; Amazon; Anthropic; Google; Hugging Face; Inflection; Microsoft; OpenAI; Salesforce

Gartner Recommended Reading

Innovation Insight for Generative AI

Emerging Tech: Generative AI Needs Focus on Accuracy and Veracity to Ensure Widespread B2B Adoption

Quick Answer: How Can You Manage Trust, Risk and Security for ChatGPT Usage in Your Enterprise?

Innovation Insight for ML-Powered Coding Assistants

Quick Answer: Will Machine-Learning-Generated Code Replace Developers?

Digital Employee Experience

Analysis By: Lane Severson, Tori Paulman

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Definition:

Digital employee experience (DEX) is a discipline that focuses on how technology affects the overall employee experience (EX). With work becoming increasingly dependent on digital technologies, organizations must embrace experience-focused methods, such as personas, journey mapping, measurement and listening, to deliver an experience that boosts digital dexterity and personal growth, builds team unity, and helps employees achieve organizational goals.

Why This Is Important

Employees spend more of their time working digitally than ever before; the digital experience affects the overall employee experience. Digital experiences make up most employee experiences, but 66% of employees experience moderate to high digital friction when using technology. On an average, employees must use 11 applications to do their work, with 36% using 11 to 25, and 5% using more than 26.

Business Impact

A holistic, coordinated approach to DEX across IT and with non-IT partners can minimize digital friction and maximize workforce digital dexterity and well-being. IT teams delivering great DEX improve their organization's talent retention, team effectiveness and process efficiencies, and adopt new ways of working. DEX significantly impacts a workers's intent to stay, with 82%, who believe they work with modern technology and engaged IT staff, intending to stay and/or grow within their organizations, compared to only 58% who do not.

Drivers

- Companies look for every advantage to attract and retain talent. Organizations must go beyond providing modern technology and services to deliver digital experiences that meet a diverse set of employees where they are in their digital workplace maturity and alignment with digital workplace ambitions.
- As foundational digital workplace technology is standardized across organizations, IT leaders are looking to provide differentiation by the way they facilitate the customization of tools to roles and processes in the organization.
- Persona, journey mapping, user experience (UX) design and design thinking are being used to ensure technology investments have a positive impact on both DEX and EX.
- Business leaders are increasingly looking for guidance on how technology can help address key strategic concerns around employee productivity, engagement experience, well-being and skills development, as well as organizational alignment.
- IT leaders are increasingly investing in DEX tools that collect and combine qualitative measurement (employee feedback) with quantitative measurement (performance, stability and use) of technology, and leverage automation and employee engagement to improve DEX.

Obstacles

- Building a business case for DEX is difficult. Common measures are subjective and benefits can't be directly attributed to DEX initiatives.
- Cost to acquire, implement and integrate technologies to improve DEX.
- DEX requires shifting from activity- and service-based to new experience- and value-based measures of success.
- The human-centric nature of DEX may not be appreciated by technology-centric IT leadership and staff.
- Low-maturity organizations may not be ready for DEX, because their focus remains on basic IT operations concepts (for example, IT service management [ITSM], endpoint management and technical debt reduction).
- Clients often cite lack of IT leader and staff skills to pivot focus toward experience development. Most organizations still do not see this as a part of their remit.
- Because DEX and EX are directly linked, if IT and HR (who owns EX) are not collaborating, success in improving either will be impaired.
- Organizations facing staffing reductions may not have the resources to invest in DEX leadership, staffing or technology.

User Recommendations

- Make the digital workplace the central point of coordination for all DEX activities.
- Align key partners in EX, HR and facilities, along with business leaders, by expanding the employee value proposition (EVP) to include DEX.
- Focus DEX initiatives by creating employee personas and prioritizing high-impact roles first. These may include revenue generating roles, customer service or product development.
- Identify key moments in an employee journey such as “the first day at work” or “return to the office” to improve, as opposed to attempting to change, the entire onboarding process.
- Combine personas and journey mapping to catalyze identification and reduction of digital friction points.
- Combine objective data from DEX, or other monitoring and management tools, with subjective data from employee listening and voice of the employee programs to guide DEX initiatives.

Gartner Recommended Reading

Deliver Peak Digital Employee Experience Excellence in 4 Steps

Tool: Digital Employee Experience Journey Maps

Innovation Insight for the Digital Employee Experience

Intelligent Platforms

Analysis By: Philip Dawson, Nathan Hill

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Definition:

Intelligent platforms provide the administration composability of infrastructure and programmable API functions with automated infrastructure intelligence. They integrate compute, storage and networking assets with some or the entire application software stack, creating dedicated workload architectures. Intelligent platform vendors also include components such as application intimacy, management tools, OSs, and virtualization bought and/or consumed as a service.

Why This Is Important

Intelligent platform solutions are differentiated against integrated system or hyperconverged infrastructure (HCI) solutions with a separate software stack purchase tied to the hardware. Pricing strategies vary greatly throughout the integrated software stack solutions as part of the shift to consumption-based infrastructure delivery. Intelligent platforms also integrate applications and business logic as bundles and partnerships.

Business Impact

Intelligent platforms optimize:

- Delivery of workload performance or application manageability that crosses over from hardware that promises lower operational costs and increased IT agility via automated, pooled resources.
- Automation and machine learning of complete stacks, hardware administration and software programmability on top of integrated systems.
- They are stand-alone running proprietary workloads that rarely compete with each other as the software stacks set the hardware options.

Drivers

- The intelligent platform market is influenced by multiple aspects of resilience and availability across on-premises, hosting or colocation and cloud locations driving composable, programmable and intelligent functions.
- Intelligent platforms are integrated as everything as a service (XaaS), with automation and management, and differ from integrated stack systems, which are hardware-integrated dedicated appliances.
- Multiple vendors are driving the market for intelligent platforms around integrated systems, HCI, cloud and virtualization. Intelligent platforms are built from a software perspective on top of HCI rather than a traditional integrated stack system that is built as a hardware appliance around hyperconverged integrated systems (HCIS).
- Vendors such as Microsoft, Nutanix and VMware are promoting valid intelligent platform software, and the market momentum around HCI software in the cloud now creates a market for multiple hardware vendors to build software management and integration services.

Obstacles

- Hybrid and multicloud strategies may not integrate well with integrated platforms, continuing the silo mentality of cloudlike delivery.
- Other platform as a service (PaaS) momentum is being integrated from packaged vendors such as SAP and Oracle, which are bundling integrated stack systems and distributed cloud infrastructure with application platform and database management system (DBMS) software. Here, the intelligence is with the PaaS software, not the intelligent infrastructure.
- An intelligent platform provides balanced XaaS workload performance, application optimization and integration, but this comes at the expense of greater vendor dependency, and inflexibility for future application customization and workload requirements.

User Recommendations

- Select infrastructure software management frameworks for overlay management as well as links to cloud infrastructure. Do not implement hardware-dependent or locked-in intelligent platform frameworks and adapters.
- Define successful intelligent platform implementations by assessing data center stakeholders and other vested interests (for example, procurement) with other lines of business responsible for agreeing with SLAs.
- Automate the infrastructure requirements for cloud management platforms (CMPs) through the use of intelligent platforms as you deliver XaaS through infrastructure platforms.

Sample Vendors

CU Coding; DataDirect Networks (DDN); Dell Technologies; Hewlett Packard Enterprise; Microsoft; Nutanix; Oracle; VMware

Gartner Recommended Reading

How to Evolve Your Physical Data Center to a Modern Operating Model

Quick Answer: How Can I Optimize the Use of Programmable Platforms for Effective Software Delivery?

How Do I Plan for Migrating My Data Center Infrastructure Into an XaaS Model?

Generative Analytics Experience

Analysis By: Julian Sun, Edgar Macari, Peter Krensky

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

Generative analytics experience is an analytics evolution that uses business terminology expressed as natural language via prompts to augment the entire data and analytics process, connecting qualitative and quantitative analytics. It leverages generative AI to empower business users by linking the interpretation of business problems and D&A problems in both directions, autogenerating code (Python, R and SQL) that interacts with the data, and narrating the insights with the business context.

Why This Is Important

Enterprises are using generative AI to improve the experience of analytics for business by better understanding the business questions, translating them into analytical questions and curating into a business-friendly data storytelling. Generative AI enhances augmented analytics with autogenerated content including data, text and code. Technology providers are developing new product lines and innovative customer engagement by integrating generative AI into the main augmented analytics offering.

Business Impact

Enterprises can implement generative analytics experience to:

- Enable business executives without an in-depth understanding of D&A context or who have low data literacy to answer critical business questions and improve decision support.
- Evolve the enterprise's analytics capabilities with more advanced analytical functions triggered by autogenerated R and Python code.
- Improve both quality and quantity of analytics content with more business users acting as analytics creators, and with more narrative business context.
- Improve and expand composable analytics by using generative analytics as the new interface to connect to insight engines.
- Activate the metadata usage to autogenerate the business context of data by incorporating generative AI with semantic layer.

Drivers

- Achieving the business outcome of data and analytics requires connection from insights to actions — a closed-loop activity. Generative analytics experience expands the connections of D&A solutions to a broader generative AI business application with natural language.
- Enterprises are accelerating the adoption of analytics to support more complex decision makings that used to have to use code-oriented data science and machine learning (DSML) solutions. Generative analytics experience can work as a unified experience layer to compose both analytics and business intelligence (ABI) and DSML solutions with better explainability compared to many augmented analytics solutions today, as the code (Python, SQL and R) is clearly generated during the process.
- The market lacks talent. Few people have both the business domain knowledge and advanced analytics skills. Generative analytics experience can fill the gap by enabling more business users with domain knowledge to ask complex business questions.
- ABI and DSML solution providers, especially the search-first vendors, have good technological foundations to integrate with generative AI technologies, which will bring immediate value to the clients if integrated properly. These include semantic layer, MLOps, knowledge graph, natural language query and catalog technologies.
- Digital workplace applications such as Slack and Teams have already integrated with ABI and DSML solutions. The use of natural language from digital workplace applications to perform analytics will form the generative analytics experience as both sides incorporate large language models.
- Enterprises that adopt a data-centric AI approach will proceed with generative analytics experience as one use case among many to achieve the outcome of new technology innovation.

Obstacles

- Natural language query is not a capability in high demand, according to Gartner client interactions over the past year. Enterprises still consider it a nice-to-have feature, and incorporating generative AI would not improve the adoption in the short term.
- Generative AI, and all the ChatGPT hype, is still new to the market. Vendors are still innovating new product lines with immature capabilities. It remains a challenge to incorporate large language models with the right governance to seamlessly integrate with the existing analytics capabilities, especially considering that the accuracy of generative AI is based on activating D&A metadata across multiple vendors.
- Use of generative analytics experience will bring extra cost as most vendors are incorporating GPT-3 or GPT-4 APIs. The usage from broader business users will drive more cost concerns.

User Recommendations

- Target the automation of certain closed-loop business outcomes of D&A by piloting use cases that leverage generative analytics experience to connect insights to action by natural language.
- Start with generative analytics experience in digital workplace applications, mobile BI and natural language query capabilities by evaluating and monitoring existing vendors' roadmap items.
- Establish the governance of generative analytics experience to minimize errors and "hallucinations" by assessing vendor's accuracy and veracity of their outputs and its feedback loop to correct and monitor the errors.

Sample Vendors

Aible; AnswerRocket; Hex Technologies; Microsoft; Pyramid Analytics; Tellius

Gartner Recommended Reading

Emerging Tech: Generative AI Needs Focus on Accuracy and Veracity to Ensure Widespread B2B Adoption

Quick Answer: What Are the Short-Term and Midterm Implications of ChatGPT for Data and Analytics?

At the Peak

AI TRiSM

Analysis By: Avivah Litan, Jeremy D'Hoinne, Bart Willemsen

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

AI trust, risk and security management (AI TRiSM) ensures AI model governance, trustworthiness, fairness, reliability, robustness, efficacy and data protection. AI TRiSM includes solutions and techniques for model interpretability and explainability, data and content anomaly detection, AI data protection, model operations and adversarial attack resistance.

Why This Is Important

AI models and applications deployed in production should be subject to protection mechanisms. Doing so ensures sustained value generation and acceptable use based on predetermined intentions. Accordingly, AI TRiSM is a framework that comprises a set of risk and security controls and trust enablers that helps enterprises govern and manage AI models and applications' life cycle — and accomplish business goals. The collateral benefit is enhanced compliance with forthcoming regulations, like the EU AI Act.

Business Impact

Organizations that do not consistently manage AI risks are exponentially inclined to experience adverse outcomes, such as project failures and breaches. Inaccurate, unethical or unintended AI outcomes, process errors and interference from malicious actors can result in security failures, financial and reputational loss or liability, and social harm. AI misperformance can also lead organizations to make suboptimal business decisions.

Drivers

- ChatGPT democratized third-party-provisioned generative AI and transformed how enterprises compete and do work. Accordingly, the risks associated with hosted, cloud-based generative AI applications are significant and rapidly evolving.

- Democratized, third-party-provisioned AI often poses considerable data confidentiality risks. This is because large, sensitive datasets used to train AI models are shared across organizations. Confidential data access must be carefully controlled to avoid adverse regulatory, commercial and reputational consequences.
- AI risk and security management imposes new operational requirements that are not fully understood and cannot be addressed by existing systems. New vendors are filling this gap.
- AI models and applications must be constantly monitored to ensure that implementations are compliant, fair and ethical. Risk management tools can identify and eliminate bias from training data and AI algorithms.
- AI model explainability must be constantly tested through model observations. Doing so ensures original explanations and interpretations of AI models remain active during model operations. If they don't, corrective actions must be taken.
- Detecting and stopping adversarial attacks on AI requires new methods that most enterprise security systems do not offer.
- Regulations for AI risk management — such as the EU AI Act and other regulatory frameworks in North America, China and India — are driving businesses to institute measures for managing AI model application risk. Such regulations define new compliance requirements organizations will have to meet on top of existing ones, like those pertaining to privacy protection.

Obstacles

- AI TRiSM is often an afterthought. Organizations generally don't consider it until models or applications are in production.
- Enterprises interfacing with hosted, large language models (LLMs) are missing native capabilities to automatically filter inputs and outputs — for example, confidential data policy violations or inaccurate information used for decision making. Also, enterprises must rely on vendor licensing agreements to ensure their confidential data remains private in the host environment.
- Once models and applications are in production, AI TRiSM becomes more challenging to retrofit to the AI workflow, thus creating inefficiencies and opening the process to potential risks.
- Most AI threats are not fully understood and not effectively addressed.

- AI TRiSM requires a cross-functional team, including legal, compliance, security, IT and data analytics staff, to establish common goals and use common frameworks — which is difficult to achieve.
- Although challenging, the integration of life cycle controls can be done with AI TRiSM.

User Recommendations

- Set up an organizational task force or dedicated unit to manage your AI TRiSM efforts. Include members who have a vested interest in your organization's AI projects.
- Work across your organization to effectively manage best-of-breed toolsets for enterprise-managed AI and applications that use hosted AI as part of a comprehensive AI TRiSM program.
- Avoid, to the extent possible, black-box models that stakeholders do not understand.
- Implement solutions that protect data used by AI models. Prepare to use different methods for different use cases and components.
- Establish data protection and privacy assurances in license agreements with vendors hosting LLM models — for example, Microsoft or OpenAI.
- Use enterprise-policy-driven content filtering for inputs and outputs to and from hosted models, such as LLMs.
- Incorporate risk management mechanisms into AI models and applications' design and operations. Constantly validate reliable and acceptable use cases.

Sample Vendors

AIShield; Arize AI; Arthur; Fiddler; ModelOp; Modzy; MOSTLY AI; Protopia AI; SolasAI; TrojAI

Gartner Recommended Reading

Use Gartner's MOST Framework for AI Trust and Risk Management

Top 5 Priorities for Managing AI Risk Within Gartner's MOST Framework

Visual Collaboration Applications

Analysis By: Brent Stewart

Benefit Rating: High

Market Penetration: More than 50% of target audience

Maturity: Mature mainstream

Definition:

Visual collaboration applications are cloud-based tools that enable teams to communicate and creatively collaborate during both asynchronous and real-time work. They provide a shared digital canvas offering collaboration features and templates for common frameworks, flows, activities and designs.

Why This Is Important

During the pandemic, visual collaboration applications became an essential part of the digital product team's toolset, and have only grown in popularity and impact as organizations return to the office or engage in hybrid work models. The most significant insights, ideas, strategies and designs for leading digital products emerge on the whiteboard of a visual collaboration app. As such, they are seen by many as the place where "the magic happens" for design, product and engineering teams.

Business Impact

Visual collaboration applications make remote and hybrid creative work possible. Without them, the only other viable approach is colocated, workshop-style collaboration that used to be standard practice for digital product teams. In fact, Gartner hypothesizes visual collaboration apps elevate creativity and productivity, regardless of whether they are used remotely or in person, due to the templates they provide, team participation they promote and traceability they enable.

Drivers

- Permanence of remote and hybrid work: The global shift to remote and hybrid work makes visual collaboration applications the “new whiteboard” and a required platform for any digital product or business strategy team, whether used in person or remotely.
- Product team collaboration: Coordinating handovers between product management, design and development can take significant effort, and a misaligned product team results in misaligned products. Visual collaboration apps reduce, and even eliminate, handovers between stakeholders and contribute to the delivery of more cohesive products.
- 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 workspace that enables shared ideation, evaluation and decision making.
- Templates: Visual collaboration tools include templates for brand, business, marketing and product strategy methods and techniques that accelerate discovery, exploration and validation of insights, ideas, strategies and designs.
- Integrations: Recent feature enhancements from vendors include integrations with popular product management, user experience (UX) design and software engineering tools.
- Generative AI: With AI completing increasingly more production work, such as screen designs, user flows, and code, the role of the human will shift strongly towards research and strategy activities. Visual collaboration tools will become the single-most important “home” for human creativity in the enterprise.

Obstacles

- Customer perception as a remote-only tool: Many view visual collaboration applications as a solution for remote or hybrid teams only. As organizations transition from fully remote work to in-office or hybrid arrangements, it is possible purpose-built visual collaboration applications (e.g., Miro, Mural, Klaxoon, etc.) will be viewed as expendable by some teams.
- Competition from design and business communication platforms: Collaboration and co-design features (such as a digital whiteboard) in design platforms (e.g., Figma [FigJam]) and business communication platforms (e.g., Microsoft Teams, Zoom Video Communications, etc.) are close to — or on par with — purpose-built visual collaboration tools.

User Recommendations

- Build a platform evaluation and selection process, by ensuring that the needs of all product stakeholders are considered when choosing a visual collaboration application.
- Employ a visual collaboration application as the de facto means for sharing product and design knowledge with development. Plan and execute workshops and design sprints on the selected platform, whether working remotely or in person.
- Use a visual collaboration application to plan and execute user research activities that require real-time, one-on-one facilitation.

Sample Vendors

Bluescape; Figma; InVision; Klaxoon; Lucid; Miro; Mural

Responsible AI

Analysis By: Svetlana Sicular

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Responsible artificial intelligence (AI) is an umbrella term for aspects of making appropriate business and ethical choices when adopting AI. These include business and societal value, risk, trust, transparency, fairness, bias mitigation, explainability, sustainability, accountability, safety, privacy, and regulatory compliance. Responsible AI encompasses organizational responsibilities and practices that ensure positive, accountable, and ethical AI development and operation.

Why This Is Important

Responsible AI has emerged as the key AI topic for Gartner clients. When AI replaces human decisions and generates brand-new artifacts, it amplifies both good and bad outcomes. Responsible AI enables the right outcomes by ensuring business value while mitigating risks. This requires a set of tools and approaches, including industry-specific methods, adopted by vendors and enterprises. More jurisdictions introduce new regulations that challenge organizations to respond in meaningful ways.

Business Impact

Responsible AI assumes accountability for AI development and use at the individual, organizational and societal levels. If AI governance is practiced by designated groups, responsible AI applies to everyone involved in the AI process. Responsible AI helps achieve fairness, even though biases are baked into the data; gain trust, although transparency and explainability methods are evolving; and ensure regulatory compliance, despite the AI's probabilistic nature.

Drivers

- Responsible AI means a deliberate approach in many directions at once. Data science's responsibility to deliver unbiased, trusted and ethical AI is just the tip of the iceberg. Responsible AI helps AI participants develop, implement, utilize and address the various drivers they face.
- Organizational driver assumes that AI's business value versus risk in regulatory, business and ethical constraints should be balanced, including employee reskilling and intellectual property protection.
- Societal driver includes resolving AI safety for societal well-being versus limiting human freedoms. Existing and pending legal guidelines and regulations, such as the EU's Artificial Intelligence Act, make responsible AI a necessity.
- Customer/citizen driver is based on fairness and ethics and requires resolving privacy versus convenience. Customers should exhibit readiness to give their data in exchange for benefits. Consumer and citizen protection regulations provide the necessary steps, but do not relieve organizations of deliberation specific to their constituents.
- With further AI adoption, the responsible AI framework is becoming more important and is better understood by vendors, buyers, society and legislators.
- AI affects all ways of life and touches all societal strata; hence, the responsible AI challenges are multifaceted and cannot be easily generalized. New problems constantly arise with rapidly evolving technologies and their uses, such as using OpenAI's ChatGPT or detecting deepfakes. Most organizations combine some of the drivers under the umbrella of responsible AI, namely, accountability, diversity, ethics, explainability, fairness, human centricity, operational responsibility, privacy, regulatory compliance, risk management, safety, transparency and trustworthiness.

Obstacles

- Poorly defined accountability for responsible AI makes it look good on paper but is ineffective in reality.
- Unawareness of AI's unintended consequences persists. Forty percent of organizations had an AI privacy breach or security incident. Many organizations turn to responsible AI only after they experience AI's negative effects, whereas prevention is easier and less stressful.
- Legislative challenges lead to efforts for regulatory compliance, while most AI regulations are still in draft. AI products' adoption of regulations for privacy and intellectual property makes it challenging for organizations to ensure compliance and avoid all possible liability risks.
- Rapidly evolving AI technologies, including tools for explainability, bias detection, privacy protection and some regulatory compliance, lull organizations into a false sense of responsibility, while mere technology is not enough. A disciplined AI ethics and governance approach is necessary, in addition to technology.

User Recommendations

- Publicize consistent approaches across all focus areas. The most typical areas of responsible AI in the enterprise are fairness, bias mitigation, ethics, risk management, privacy, sustainability and regulatory compliance.
- Designate a champion accountable for the responsible development and use of AI for each use case.
- Define model design and exploitation principles. Address responsible AI in all phases of model development and implementation cycles. Go for hard trade-off questions. Provide responsible AI training to personnel.
- Establish operationalize responsible AI principles. Ensure diversity of participants and the ease to voice AI concerns.
- Participate in industry or societal AI groups. Learn best practices and contribute your own, because everybody will benefit from this. Ensure policies account for the needs of any internal or external stakeholders.

Sample Vendors

Amazon; Arthur; Fiddler; Google; H2O.ai; IBM; Microsoft; Responsible AI Institute; TAZI.AI; TruEra

Gartner Recommended Reading

A Comprehensive Guide to Responsible AI

Expert Insight Video: What Is Responsible AI and Why Should You Care About It?

Best Practices for the Responsible Use of Natural Language Technologies

Activate Responsible AI Principles Using Human-Centered Design Techniques

How to Ensure Your Vendors Are Accountable for Governance of Responsible AI

Emotion AI

Analysis By: Annette Zimmermann

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

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

Why This Is Important

Emotion AI is considered transformational as it turns human behavioral attributes into data that will have a large impact on human-machine interface (HMI). Machines will become more “humanized” as they can detect sentiments in many different contexts. Furthermore, applying deep learning to computer vision or audio-based systems to analyze emotions in real time has spawned new use cases for customer experience enhancements, employee wellness and many other areas.

Business Impact

Contact centers use voice analysis and natural language processing (NLP)-based algorithms to detect emotions in voice conversations, in personal chat conversations and chatbots. Computer vision (CV)-based emotion AI has already been used for more than a decade in market research with neuromarketing platforms that test users' reactions toward products. In addition, we see the technology expanding to other verticals and use cases, i.e., healthcare (diagnostic), sales enablement and employee wellness.

Drivers

The increasing number of use cases we have identified indicates an increase in commercialization as emotion AI finds applicability in new domains:

- One of the drivers for detecting emotions/states is the need for a system to act more sympathetically. For instance, it creates anthropomorphic qualities for personal assistant robots (PARs) and virtual beings, making them appear more "human." This "emotional capability" is an important element in enhancing the communication and interaction between users and a PAR.
- This can be an empathic avatar or an emotion-detection-enabled chatbot. A person's daily behavior, communication and decisions are based on emotions — our nonverbal responses in a one-to-one communication are an inseparable element from our dialogues and need to be considered in the human-machine interface (HMI) concept.
- Combinatorial technology solutions such as computer-vision-based and audio analytics, or language-based and computer vision, enable customer experience enhancements.
- Strongest adoption is currently happening in the context of contact centers where voice-based emotion analysis supports multiple use cases such as real-time analysis on voice conversations, emotion detection in chat conversations, emotional chatbots and more.
- Market research and neuromarketing tools are continuously leveraging emotion detection in various user scenarios including focus groups and product testing. Vendors have been extending their offerings toward remote/online interviews during 2020 — due to the pandemic.
- In the creation of virtual beings in customer service or other consumer-facing scenarios, emotional responses are a critical element.

- As the metaverse unfolds, virtual beings will play an important role as business models evolve and the entire ecosystem of this new digital world emerges.

Obstacles

- Privacy concerns are the main obstacle to rapid adoption in the enterprise. This is especially a concern in real-life situations (vs. lab/research environments) for both consumer-facing (e.g., monitoring emotions in a retail environment via cameras) and employee-facing situations. Research environments like product testing have the advantage that the emotion AI is used for this specific purpose and the user (product tester) is fully aware that their emotions are being captured to improve usability or other features.
- Bias: When using facial expression analysis, models are likely to be retrained in different geographies to get the system to detect the different nuances present due to different cultural backgrounds.
- Variation across modalities. Certain emotions can be better detected with one technology mode than with another. For instance, “irony” can be detected using voice-based analysis while this is close to impossible to detect with facial expression analysis.

User Recommendations

- Review vendors’ capabilities and reference cases carefully. As the market is currently very immature, most vendors are focused on two or three use cases in two or three industries. At the same time, identifying and processing human emotion is currently a gray area, especially in the EU. The EU Commission has started an initiative to review the ethical aspects of AI technologies, and emotion AI will certainly be part of this debate.
- Enhance your customer analytics and behavioral profiling by applying emotion AI technologies bringing your customer experience strategy to the next level.
- Be use-case-driven. The use case will determine the emotion AI technology to be used and vendor selection.
- Appoint responsibility for data privacy in your organization — a chief data privacy officer or equivalent.
- Work with your vendor on change management in order to avoid user backlash due to sensitive data being collected.

Sample Vendors

Behavioral Signals; Cogito; DAVI; Intelligent Voice; kama.ai; MorphCast; Soul Machines; Superceed; Symanto; Uniphore

Gartner Recommended Reading

Competitive Landscape: Emotion AI Technologies

Emerging Tech: Computer Vision, Voice Analysis and CGI Evolve Into Emotionally Intelligent Virtual Beings

Tool: Vendor Identification for Natural Language Technologies

DEX Tools

Analysis By: Dan Wilson, Autumn Stanish, Stuart Downes, Tom Cipolla

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

Digital employee experience (DEX) tools help IT leaders measure and continuously improve the performance and employee sentiment toward company-provided technology. Near-real-time processing of aggregated data from endpoints, applications, employee sentiment and organizational context surfaces actionable insights and drives self-healing automation, optimized support and employee engagement. Insights and self-healing can also enhance IT support.

Why This Is Important

Accelerated digital workplace investment has highlighted gaps in objective measurement and continuous improvement of DEX. Client interest in DEX has steadily increased since the start of 2021. Primary use cases focus on tactical and technology issues however mature digital workplaces are expanding to include more strategic use cases. Their cross-functional DEX strategy directly targets reduced IT overhead and improved DEX as a way to retain and attract top talent.

Business Impact

DEX tools shift focus from technology management to more business value-added work. Specific impacts include:

- Fewer IT issues that disrupt and impede employee productivity.
- Reduced IT overhead through automation.
- Improved endpoint configuration and patch compliance.
- Better balance of objective and subjective success measures, including technology adoption, performance and employee sentiment.
- IT becoming more proactive and human-centric.
- Increased ability to retain talent.

Drivers

- DEX is a major influencer of the overall employee experience.
- Organizations are increasingly dependent on technology to perform their work.
- Employees are suffering in silence by living with or working around issues rather than reporting issues to IT.
- IT leaders seek broader measurement and management capabilities as internally focused activity KPIs have proven incomplete.
- IT administrators are looking for better visibility into how hybrid workers' devices are performing.
- Employee sentiment toward technology cannot be measured effectively with periodic or transactional surveys alone. Feedback must also include how employees feel about and engage with specific devices or apps, and how technology changes impact their work.
- Service desk and other IT support analysts require faster access to device configuration and performance data to offset an increase in support interaction volumes and wait times.
- Increasing threat of cyberattacks demands faster identification and remediation of configuration issues and missing patches.
- Increased focus on sustainable IT is promoting consumption- and performance-based device life cycles in place of refreshing devices on a schedule.
- AI and machine learning have significantly increased the value and capability of SaaS-based DEX tools.

Obstacles

- Legacy culture that does not trust the tool's insights or sees automation as a threat.
- SaaS- or cloud-averse organizations will be limited to less capable on-premises offerings.
- Low-maturity IT support or end-user computing (EUC) organizations may not be ready for DEX tools.
- An "ignorance is bliss" mindset fearing that a sudden unveiling of the massive volume issues will make IT leadership look bad.
- The cost to acquire, implement and integrate new tools.
- Insufficient staffing levels or skills required to operate a DEX tool.
- Failure to adjust IT staff rewards and recognition to promote new behaviors and DEX tool adoption.
- The need to account for legislative, regulatory, industry or labor union limits on data collection and use.
- The lack of maturity and feature parity among representative and similar tools including common APIs for integration.
- Smaller organizations have limited options given that many DEX tools target larger enterprises.

User Recommendations

In its third year on the Hype Cycle, DEX tools have reached the Peak of Inflated Expectations. Market penetration and maturity have also advanced. Organizations that have not invested in DEX tools should:

- Build a broader team by collaborating with business and IT peers to define IT and non-IT use cases.
- Ensure the business case focuses on objective and measurable impacts by minimizing reliance on vendor-provided ROI templates.
- Choose a DEX tool that best fits your needs and budget by using the Market Guide for DEX Tools.

- Assign dedicated ownership and allocate dedicated resources to deploy and drive DEX tool adoption and ROI. Resources can be reallocated from IT support roles as proactive automation reduces support volumes.
- Incentivize new behaviors by adapting IT performance measures to focus more on outcomes than activities.
- Avoid diminishing returns by adding features and use cases as the team and DEX tool matures.

Sample Vendors

1E; ControlUp Technologies; HP Inc.; Ivanti; Lakeside Software; Nanoheal; Nexthink; Riverbed Technology; Tanium; VMware

Gartner Recommended Reading

How to Successfully Deploy a DEX Tool

Market Guide for DEX Tools

Employee Enablement Is Key to Digital Workplace Services Leaders' Survival

Digital Work Hubs

Analysis By: Joe Mariano, Gavin Tay

Benefit Rating: High

Market Penetration: More than 50% of target audience

Maturity: Mature mainstream

Definition:

Digital work hubs are an assembly of ever changing team productivity and collaboration applications created for employees with diverse needs. It can be augmented with services for development, automation, artificial intelligence (AI) and analytics.

Why This Is Important

Foundational work hub services (e.g., Microsoft 365, Google Workspace, etc.) have peaked in usage. However, gaps in these services continue demand for purpose-built work hub services (visual collaboration, collaborative work management, workstream collaboration, meeting services and content services platforms, etc.). In many cases these services are not deployed enterprisewide. Instead they are implemented at the domain or situational level to meet line of business strategic needs.

Business Impact

The impact of effective work hub usage starts with productivity, but ends with opportunities to reduce cycle time and improve business results arising from more effective collaboration. This coordination via the hub can be especially helpful to citizen developers and business technologists working in fusion teams leveraging work hubs to meet organizational goals.

Drivers

- Foundational work hub services, such as Google Workspace and Microsoft 365, have become the focal point of work hub application portfolios. However, IT leaders, business technologists and fusion teams are beginning to realize that they can't do everything for domain and situational needs. The impact on domain and situational work hub services means updating digital workplace charter to better align with strategic line of business needs.
- Executive leadership wants to exploit the value of work hub services long term, not just for the ROI, but to drive and enable employees' digital skills to help build digital side hustles and develop employees into business technologists.
- 2022 Gartner's Digital Worker Survey found participants on average use 11 different applications to get work done and more than 70% of the digital workers use between 6-25 applications at work. Also almost half of respondents struggled to find the information or data needed to do their job. IT leaders will need to better assess employees' needs and take greater care in creating digital employees and experience that streamline the use of multiple work hubs.

Obstacles

- IT leaders think that a foundational work hub services will meet all their collaborative needs. In fact, best-of-breed services will be needed to meet the contextualized use cases of groups such as frontline workers, marketing and sales.
- The rate of additional functions added to work hub services has accelerated to the point that IT resource and business employees cannot keep up, which is limiting the overall value of tools.

User Recommendations

- Assume that a single work hub vendor will not meet all your needs. In order to meet your digital employee experiences (DEX) goals it will take a combination of both foundational and domain or situational services.
- IT leaders must take on more of a collaborative role, working with business functions to understand the employee needs, especially with business technologists who can help drive new use cases and popularize digital workplace technology rather than IT working with one another.
- Use Gartner's ACME framework to govern usage efforts by focusing on domain and situational needs.
- Assess the technical fitness of your work hub applications to determine fit for purpose. If applications with similar functionality can be merged, better resource allocation can be reached. Deem the work hub to be a source of continuous innovation in a form that is relatively easy to adopt. Tie augmentation services (e.g., everyday AI, cross-tool integration and citizen development tools) to further growth in the value of the services.

Sample Vendors

Alibaba; Google Workspace; Microsoft 365; Monday.com; Salesforce; Slack; Zoho

Gartner Recommended Reading

Video: Use Gartner's ACME Framework to Rationalize Your Digital Workplace Application Portfolio

Tool: Digital Employee Experience Journey Maps

Innovation Insight for Collaborative Workflow Automation

Augmented Analytics

Analysis By: David Pidsley, Anirudh Ganeshan

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

Augmented analytics uses AI to automate analytics workflows in platforms, contextualizing user interfaces with automated insights, generative storytelling explanations and collaborative exploration. Driven by ML and generative AI, it enables natural language queries and personalized analytics catalogs. It democratizes advanced analytics with augmented data ingestion, preparation, analytics content and DSML model development. It also curbs human biases and accelerates insights for diverse users.

Why This Is Important

Many activities associated with data, including preparation, pattern identification, transformation, model development and insight sharing, remain highly manual. This friction limits the user adoption and business impact of analytics. Enhancing these capabilities with generative AI democratizes analytics and reduces barriers to entry by allowing users to perform complex analytics tasks with low/no code.

Business Impact

Augmented analytics is transforming how users interact with analytics content. Features like conversational interfaces are making analytics more accessible, explainable and expedient. Generative AI is changing how people interact with augmented analytics, enabling access to deeper insights from data. Once confined to experts only, insights from advanced analytics are now in the hands of business analysts, decision makers and operational workers across the enterprise. These augmented consumers are driving new sources of business value.

Drivers

- Organizations increasingly want to analyze more complex datasets combining diverse data from both internal and external sources. With an increasing number of variables to explore in such harmonized data, it is practically impossible for users to explore every pattern combination. It is even more difficult for users to determine whether their findings are the most relevant, significant and actionable. Expanding the use of augmented analytics will reduce the time users spend on exploring data, while giving them more time to act on the most relevant insights.
- Generative AI has accelerated market interest in dynamic data stories and other combinations of augmented analytics features that automate insights. Generative AI combines augmented analytics with natural language query, natural language generation, and anomaly detection to dynamically generate data stories for users in their contexts. This type of multiexperience UI will reduce the use of predefined dashboards for monitoring and analysis, and increase the use of augmented analytics.
- Vendor technology innovation is pushing augmented analytics forward. With the explosion of generative AI, augmented analytics is receiving heightened attention. ABI platforms are now integrating large language models like GPT-4, allowing users to generate, debug and convert code, create data stories, and aid in data preparation. This integration has also enabled newer users to emerge, fueling analytics adoption. In a next wave of generative analytics experiences, users may see the entire workflow become AI-driven.
- Most organizations leverage multiple ABI platforms, causing exponential proliferation of analytics content. Coupled with a lack of governance, this proliferation often leads to inconsistencies in metrics and insights, duplication of reports and dashboards, and an overall decline of trust in data. Hence, analytics catalogs, powered by augmented analytics capabilities with generative AI, are becoming key in allowing users to find and recommend analytics content.
- By integrating with digital workplace applications (e.g., Microsoft Teams and Slack), augmented analytics features allow users to share and collaborate on insights.

Obstacles

- **Lack of trust in autogenerated models and insights:** Organizations must ensure that the augmented approach is transparent and auditable for accuracy and bias. They must establish a process to review and certify analyses created. These guardrails are especially important with generative AI being included within ABI platforms.
- **Training and rapidly evolving skills needs:** Obtaining desired skill sets and data literacy standards is a never-ending challenge, and leaders need broad and diverse training for multiple personas.
- **Ecosystem requirements:** It will be critical to build an ecosystem that includes not only tools, but also data assets, people and processes to support the use of augmented analytics.
- **Cultural barriers:** Analytics developers writing analytics-as-code and business analysts accustomed to visual self-service analytics may regard augmented analytics as a "nice to have" feature. However, they neither utilize nor rely on it in their analytics content production workflows.

User Recommendations

- Identify the personas and use cases that will benefit most from augmented analytics capabilities.
- Ensure that users can get value from new augmented analytics features by providing targeted and context-specific training. Invest in data literacy to ensure responsible adoption.
- Focus on explainability as a key feature to build trust in autogenerated models. Create learning opportunities for those who wish to know more about the theory and inner workings of augmented analytics solutions.
- Assess the augmented analytics capabilities and roadmaps of ABI platforms, data science platforms, data preparation platforms and startups as they mature. Look into the upfront setup and data preparation required, the range of data types and algorithms supported, the integration with existing tools, the explainability of the models, and the accuracy of the findings.
- Provide incentives for citizen data scientists to collaborate with, and be coached by, specialist data scientists who still need to validate models, findings and applications.

Sample Vendors

AnswerRocket; iGenius; Microsoft; Oracle; Pyramid Analytics; Qlik; Sisense; Tableau; Tellius; ThoughtSpot

Gartner Recommended Reading

Market Guide for Augmented Analytics

Magic Quadrant for Analytics and Business Intelligence Platforms

Critical Capabilities for Analytics and Business Intelligence Platforms

Is Your Business Intelligence Enabling Intelligent Business?

Top Trends in Data and Analytics, 2023

Cloud-Native

Analysis By: David Smith, Michael Warrilow

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Cloud-native refers to something created to optimally leverage or implement cloud characteristics. Those cloud characteristics are part of the original definition of cloud computing, and include capabilities delivered as a service. Cloud computing characteristics also include being scalable and elastic, shared, metered by use, service based, and ubiquitous by means of internet technologies.

Why This Is Important

Cloud-native is a popular term. Depending on its meaning, it can be described as taking full advantage of the cloud capabilities of a cloud provider, or using approaches pioneered in the cloud to deliver benefits wherever needed, via specific technologies such as containers. Cloud-native is not one thing, and there is a battle of ideas.

Business Impact

Cloud-native is a popular, hyped concept that aspires to attain and maximize the benefits of cloud computing; however, the realization of those benefits varies. For example, if a traditional, noncloud application is migrated to the cloud through a lift-and-shift approach, the application is unlikely to fully leverage cloud characteristics and deliver the maximum benefits. An application rewritten to take advantage of cloud capabilities is more likely to deliver the expected cloud outcomes.

Drivers

- The primary driver for cloud-native is the desire to "get the most out of the cloud." The cloud itself means different things to different constituencies, so it's not surprising that cloud-native means different things. What drives people to one or another of these approaches varies.
- Cloud-native can optimally leverage cloud technologies and benefits. The two most common meanings in use are contradictory. CSP-native is all about using native features and, therefore, locking yourself into a provider. Container-native focuses on containers, and may evolve into other technologies. This doesn't guarantee portability, but is directionally consistent with the goal.
- There are multiple aspects to cloud-native, ranging from design to architectural to operational practices. Examples include LIFESPAR and the Twelve-Factor App (i.e., cloud-native application design) and DevOps (cloud-native operations).
- Cloud-native can be viewed on a continuum. It's not a question of whether something is cloud-native or not; it's the degree to which it is. The more it aligns with cloud characteristics, the more cloud-native it is.

Obstacles

- Cloud-native is confusing due to its many interpretations. It's especially challenging with respect to hype, because confusion amplifies hype. The biggest obstacle is getting beyond the confusion to focus on desired outcomes.
- It is essential to be realistic about the portability that can be achieved and the cost. Otherwise, these features may not be used "with your eyes open," and you may not be aware you are doing so.
- In cloud strategy efforts, principles are the most important component. Cloud-native and multicloud are often stated as principles in a cloud strategy. These principles can contradict each other, and require further explanation.
- Use of the term "cloud-native" requires clarification of which meaning is being used. This is a function of the hype surrounding cloud-native. Being clear about goals is key to optimally leveraging cloud-native. Assuming that containerizing an application will inherently make it cloud-native is an obstacle. We call this "container-native."

User Recommendations

- Focus on the outcomes you want from using the cloud, rather than focusing purely on the definition of cloud-native. The more your use cases align with core cloud characteristics, the more likely you are to realize the benefits of using the cloud.
- Assess vendor claims about their cloud-native capabilities with skepticism. Vendors use the term "cloud-native" to promote their offerings, regardless of how cloud-native their offerings are.
- Ensure that the supporting tools, processes and operations support cloud characteristics when building or acquiring cloud-native applications or services. The value of cloud-native applications can be subverted when the approaches of the supporting elements are not cloud-native.
- Embrace services designed to bring you closer to cloud-native outcomes. These can include containers, microservices architecture, serverless design, functions and many platform-as-a-service (PaaS) services. However, using these technologies should be a means, not a goal.

Gartner Recommended Reading

The Cloud Strategy Cookbook, 2023

Infographic: Cloud-Native and Multicloud — Buzzwords or Key Principles in Your Cloud Strategy

A CTO's Guide to Cloud-Native: Answering the Top 10 FAQs

Define and Understand New Cloud Terms to Succeed in the New Cloud Era

Superapps

Analysis By: Jason Wong

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Definition:

A superapp is a mobile app that provides end users (e.g., customers, partners or employees) with a set of core features, as well as access to independently created miniapps. The superapp is an open platform to deliver a miniapps ecosystem. Users can choose miniapps from this ecosystem to activate for consistent and personalized app experiences. There is no separate app store or marketplace for miniapps; instead, superapp users discover, activate and deactivate miniapps in the superapp.

Why This Is Important

Users demand mobile-first experiences that are powerful and easy to use. Superapps have expanded outside China and South Asia to India (e.g., Tata Neu, MyJio and Paytm); Latin America (e.g., Rappi, PicPay, Mercado Libre); and the Middle East/Africa (e.g., M-PESA, Careem and Yassir). The superapp concept is rapidly expanding to employee-facing use cases, such as frontline workers, and employee communications and engagement, such as Walmart's me@Walmart and Wipro's MyWipro apps.

Business Impact

Organizations can create superapps to consolidate multiple mobile apps or related services that reduce user experience (UX) friction (such as context switching) and development effort. Superapps can achieve economies of scale and leverage the network effect of a larger user base and multiple providers. Superapps provide a more-engaging experience for their customers, partners or employees. They improve UX by enabling users to activate their own toolboxes of miniapps and services.

Drivers

- Superapps are gaining interest from forward-thinking organizations that embrace composable application and architecture strategies to power new digital business opportunities in their industries or adjacent markets.
- Superapps are growing beyond mobile apps for consumer use cases. Frontline and remote work trends are driving the evolution of employee communications apps into workforce superapps through the addition of plug-ins for HR, payroll, shift management and other miniapp functions.
- The superapp concept is expanding into enterprise software as a service (SaaS) applications and tools, such as workflow, collaboration and messaging platforms (e.g., Slack and Microsoft Teams, which already have a large number of add-on apps to their main applications). Superapps are starting to expand to support a wide range of modalities, including chatbots, Internet of Things (IoT) technologies and immersive experiences.
- To achieve agility and digital transformation, a superapp advances the concept of a composite application that aggregates services, features and functions into a single app. Multiple internal development teams and external partners can provide discrete services to users by building and deploying modular miniapps to the superapp. This development ecosystem also amplifies the superapp's value, by providing convenient access to a broader range of services in the app.

Obstacles

- There are numerous technical ways to build a superapp, but creating the business ecosystem can become a bigger challenge than technology implementation. A superapp serves as a platform for internally developed miniapps across the business and for third-party, externally developed miniapps. Business partners are needed to create an extended ecosystem for monetization by deploying miniapps to an established user base.
- Another obstacle is getting the UX design of a superapp right for the audience, and also having consistency of the miniapps published to the superapp. Different user personas prefer to interact differently with miniapps — for example, some prefer single, task-focused miniapps versus others preferring everything at their fingertips. Inconsistent UX patterns in a superapp could negatively affect adoption and retention.
- Data sharing could be complex, including simple user authentication, such as single sign-on (SSO), and tracking user preferences or app usage history.

User Recommendations

- Educate partners on the innovations and business value a superapp strategy can drive to improve or consolidate mobile apps.
- Ensure that there is a sound business model and organizational structure to support the distributed development ecosystem for miniapps.
- Secure executive sponsorship by preparing the partnership strategy and financial case for funding as a digital business initiative.
- Identify core features in your superapp (e.g., commerce, communications or collaboration) that will drive a critical mass of adopters and create interest on the part of developers to serve those users
- Offer an easy developer experience and convenient developer tools (e.g., APIs, design guidelines, software development kits [SDKs] and frameworks) for partners to build, test, register and submit miniapps for potential monetization.
- Define security and data protection needs by establishing governance reinforced with common platform implementation to satisfy security and data protection constraints.

Sample Vendors

Alipay; DingTalk GeneXus; Ionic; KOBIL; LINE; Microsoft; PayPay; Paytm; Slack; WeChat

Gartner Recommended Reading

Quick Answer: What Is a Superapp?

Quick Answer: How Does a Superapp Benefit the Digital Employee Experience?

How Banks Can Take On Super-Apps

Top Strategic Technology Trends for 2023: Superapps

Composable Applications

Analysis By: Yefim Natis, Anne Thomas, Paul Vincent

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

Composable applications are built, in part or in whole, as flexible assemblies (compositions) of software components that represent well-defined business capabilities, packaged for programmatic access. The business-centric modularity of composable applications empowers democratized access to technology and business innovation. Composable applications support faster, safe and efficient digital business innovation. Advanced use of composable applications allows cross-application compositions.

Why This Is Important

Composable applications help support resilience, adaptability and growth of business in the context of increasingly frequent challenges, disruptions and opportunities. They support fast-paced business change while protecting the integrity of the outcomes, and bridge application software and business operations by using coarse-grained business-centric software modularity. Organizations that use composable applications maintain customer loyalty by better tracking their changing needs.

Business Impact

The more composable applications there are in the organization's portfolio, the better the organization is prepared to support changing business requirements through digital innovation. In return, greater confidence in the agility of applications promotes faster business thinking. The improved agility of business technology strengthens the ability of an organization to maintain and grow its business, a high value in the modern context of fast innovation, frequent challenges and opportunities.

Drivers

- In the continuously changing business context, demand for business adaptability directs organizations toward technology architecture that supports fast, safe and efficient application change.
- The demand for active participation of business decision makers in the design of their digital experiences promotes the adoption of technology models that are accessible and useful to business experts in addition to, and in cooperation with, technical professionals.
- The need to reduce the costs of redundancy in software capabilities across applications and business units drives organizations to reusable business modularity and from there to composability.
- The increasing number of vendors offering API-centric SaaS (also known as API products or "headless" SaaS) builds up a portfolio of available business-centric packaged application components — promoting their use as building blocks of composable business applications.
- The emerging architecture of micro front ends and superapps advances the principles of composability to the multifunctional user experience, promoting broader adoption of composability in application design.
- Fast-growing competence in mainstream organizations for the management of broad collections of APIs and event streams creates a technology foundation for safe operation of a composable business technology environment.
- The emerging business model of industry cloud, promotes the architecture of modularity and composition inside and across vertical use cases.

Obstacles

- Limited experience of composable thinking and planning in most software engineering organizations complicates composable design efforts and transition plans.
- Limited practice of business-IT collaboration for application design delays the effective composable design that depends on the complementary expert talents in multidisciplinary fusion teams.
- Most legacy applications can participate in composition via their APIs and/or event streams, but their architecture provides only minimal autonomy, delaying the full positive effect of composable architecture.
- Limited development and platform tools dedicated to composable application architecture limit the early success to advanced design teams capable of adapting precursor technologies to new objectives.
- Insufficient mapping of architectural thinking and models between business and technology planners makes digital representation of business functionality less prepared to track real-world business change.

User Recommendations

- Promote modular thinking as the means to great flexibility in business and software innovation.
- Champion API-first business software design, whether or not the application is also packaging the traditional UI capabilities.
- Build competence in API and event stream management as the precursor to managing composable business software modularity.
- Prioritize the formation of business-IT fusion teams to support faster and more effective adaptive change of business applications.
- Use low-code/no-code technologies to facilitate design collaboration of business and technology experts in fusion teams.
- Build an investment case for composability by highlighting how aging digital assets endanger the future success of the business by forming barriers to innovation, competition and customer satisfaction at the pace of market change.
- Gradually modernize (or replace) existing applications toward an architecture of business-centric modularity.

Sample Vendors

Elastic Path Software; Mambu; Novulo; Olympe; Spryker Systems

Gartner Recommended Reading

Becoming Composable: A Gartner Trend Insight Report

Quick Answer: Who's Who in the Life Cycle of Composable Applications?

Case Study: Composable Platform Strategy to Drive Business Agility (Nike)

Predicts 2023: Composable Applications Accelerate Business Innovation

Use Gartner's Reference Model to Deliver Intelligent Composable Business Applications

Sliding into the Trough

Conversational User Interfaces

Analysis By: Gabriele Rigon, Stephen Emmott, Van Baker, Bern Elliot, Frank O'Connor

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Conversational user interfaces (CUIs) are human-computer interfaces that enable natural language interactions for the purpose of fulfilling a request, such as answering a question or completing a task. The sophistication of a CUI can vary from understanding basic queries to handling complex multiturn dialogs, so CUIs range from Q&A bots to more advanced virtual assistants (VAs). CUIs fundamentally shift the interaction medium from traditional point-and-click to natural-language-driven.

Why This Is Important

UIs provide direct control between the user and the applications they are operating. In a CUI, this responsibility shifts from application-specific controls to conversational controls, and the CUI is determining the intent and acting upon it. This makes CUIs more widespread as agent (acting) UIs for software, devices and the Internet of Things. AI-enabled CUIs can provide a single, intuitive, common interface to multiple application functions across the entire organization.

Business Impact

Training, onboarding, escalations, productivity, empowerment and responsibility all change with CUIs and need to be embraced as part of CUI projects. AI-enabled CUIs can dramatically standardize and improve the usability of a variety of applications across all business functions, such as CRM, the digital workplace and ERP, hence improving efficiency. They can also benefit customer experience when used to automate support in the form of self-service chatbots or VAs.

Drivers

- **Users' expectations and generative AI:** Users increasingly expect to be able to hold conversations with and ask natural language questions of the applications they use. CUIs are beginning to complement or even replace traditional interfaces in a variety of applications, such as search and insight engines, business intelligence platforms and productivity software, such as document and spreadsheet applications. The trend toward the enablement of interactions in natural language between users (customers and employees) and software has been significantly accelerated by the hype around generative AI and ChatGPT.

- **Conversational AI platforms:** The underlying technology supporting custom-developed CUIs (like chatbots and VAs) built on top of conversational AI platforms (CAIPs) has matured significantly in the last few years. Vendors are investing in core AI technologies, such as large language models (LLMs), to improve components such as natural language understanding. They are also expanding their capabilities to support broader use cases beyond self-service chatbots and toward broader B2C and B2E automation.

- **Search:** CUIs will be increasingly used for knowledge search and retrieval based on document ingestion. Some technologies driving this include LLM-enabled enterprise applications, such as Microsoft 365 Copilot, as well as ChatGPT-like Q&A chatbots and LLM-powered VAs. This is also causing the market to be flooded with dedicated add-ons and even new vendors.

- **Multimodal interactions:** Generative AI methods are increasing the availability of multimodal interactions, such as those based on images, videos, audio and other sensory data. As a matter of fact, beyond text, voice is emerging as a primary modality of interaction between users and CUIs. This can add a powerful enhancement to the communications. Multimodality can solve some of the problems of the current generation of LLMs. Multimodal language models will also unlock new applications that were impossible with text-only models.

Obstacles

- Developing CUIs is intrinsically complex and requires more effort than graphical UIs. More sophistication has to be built into VAs' conversational capabilities to deal with a range of users and edge cases. CUIs' predictions about users' intents can be wrong, so the CUI designer has to keep ambiguity in mind.

- Lack of CUI personality, poor accuracy and conversational design, as well as unreliability of answers generated by LLMs, can affect user sentiments negatively and, as a consequence, adoption and ROI.

- CUIs are available from many sources, whether offered by applications, CAIPs or through separate augmentation. For example, transactional conversational AI use cases require capabilities that only platforms can provide. Q&A scenarios may also be supported by architectures primarily leveraging search and LLMs. Understanding the sophistication and the limitations of these and other approaches is not trivial. This may lead buyers to choose the wrong tooling and many CUIs to fail.

User Recommendations

- Treat CUIs as transformative, and plan on them becoming the dominant interaction model between users and applications.
- Prioritize the requirements of your custom CUIs in terms of sophistication, integration and control. Do not underestimate the risks of building CUIs that do not meet enterprise-grade performance, accuracy and security standards.
- Develop your strategy for consolidation upon one or few conversational AI platforms or approaches, avoiding challenges that derive from the proliferation of CUIs deployed by different business units in different regions.
- Educate stakeholders around benefits and limitations of generative-AI-enabled CUIs, and encourage well-informed employees to experiment with such CUIs.
- Prepare for new roles and skills in the enterprise. Dialogue designers and AI trainers, for example, are needed to enable custom CUI initiatives. Citizen developers will acquire prompt engineering and model management skills to leverage generative-AI-enabled CUIs effectively.

Sample Vendors

Amelia; Avaamo; Cognigy; Google; IBM; Kore.ai; Omilia; OneReach.ai; OpenAI

Gartner Recommended Reading

Magic Quadrant for Enterprise Conversational AI Platforms

Critical Capabilities for Enterprise Conversational AI Platforms

Competitive Landscape: Conversational AI Platform Providers

Emerging Tech Roundup: ChatGPT Hype Fuels Urgency for Advancing Conversational AI and Generative AI

Digital Experience Monitoring

Analysis By: Mrudula Bangera, Padraig Byrne

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Mature mainstream

Definition:

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

Why This Is Important

DEM helps organizations address visibility in two key areas:

- **Remote employees' experience:** Instrumenting the corporate network is relatively easy. Doing the same for a home or coffee shop network ranges from challenging to impossible.
- **Web applications:** Visibility into the performance of as-a-service-based applications (including e-commerce) presents a unique challenge, due to the location of the application and difficulty in instrumenting cloud-based environments.

Business Impact

RUM and STM technologies in DEM allow businesses to understand how the users (customers) are interacting with the brand across mobile and web. The endpoint monitoring technology gives organizations increased flexibility to gain visibility into the endpoint, network and service of the user, irrespective of where workers are located, and without requiring extensive instrumentation of the physical environment.

Drivers

- **User experience:** Organizations are coming to the realization that metrics tell only part of the story. If the user is having a less-than-ideal experience, then whatever the metrics say are meaningless. DEM can help provide visibility into not just the metric-based performance, but also the subjective portion of the user experience.
- **SaaS:** As organizations move from on-premises-based applications to SaaS-based applications, they lose visibility into, and control over, the performance of these applications. A user of a SaaS-based application in one location using a specific endpoint (such as a laptop or mobile) may have a totally different experience from a different user at a different location using a different endpoint. Even the same user at the same endpoint may have very different experiences, depending on where they are located at the time. DEM enables organizations to understand where the performance bottlenecks are, so they can be addressed.
- **Work from anywhere:** The massive changes in workforce location brought on by the COVID-19 pandemic are driving infrastructure and operations (I&O) teams to adopt endpoint monitoring technologies to analyze and optimize remote workers' access to, and use of, applications.
- **"Last mile" in full-stack observability:** Monitoring of applications from the server side is important, but I&O teams need to understand the end-user journey and the corollary experience. Endpoint monitoring through DEM tools allows I&O teams to track performance from the endpoint's connectivity to Wi-Fi through service provider networks and beyond.
- **Commercial off-the-shelf (COTS) and virtual desktop infrastructure:** Organizations often rely on COTS applications for critical business operations. The very nature of these solutions makes them difficult (if not impossible) to instrument from an application perspective. I&O teams rely on the visibility provided by DEM tools to provide information on performance from the end user's perspective.

Obstacles

- There are very few DEM vendors that provide functionality across all three pillars of DEM (synthetic monitoring, endpoint visibility and real-user monitoring), making it difficult to choose a vendor that can provide a complete solution.
- Most DEM visibility comes from an agent installed on the endpoint, which can represent a challenge for organizations that are already running numerous endpoint agents.
- Large organizations may struggle with the management of tens or hundreds of thousands of endpoints via a DEM tool user interface.
- Due to the sheer volume of data generated by DEM tools, organizations without a robust analytics approach may struggle to make sense of all the data. Few vendors use analytics to enable a proactive approach in this space.
- User experience can be enhanced through autorectification of anomalies. However, very few DEM vendors provide the ability to automate remediation.

User Recommendations

- Gain a holistic view of digital experience by choosing and deploying DEM solutions that gather sentiment alongside other data points.
- Minimize endpoint performance impacts by evaluating DEM capabilities from vendors and tools you already own (for example, DEM capabilities from a unified endpoint management , security or remote access vendor).
- Enable insight-driven automation by choosing DEM solutions that provide analytics and remediation functions.
- Measure SaaS application performance by choosing DEM solutions that can perform real-user monitoring and synthetic transaction monitoring.
- Gain transparency into employee experience by monitoring as many endpoints as possible.

Sample Vendors

Apica; Catchpoint; Cisco; Fortinet; Kadiska; Lakeside Software

Gartner Recommended Reading

Market Guide for Digital Experience Monitoring

How to Monitor and Troubleshoot Remote Workers' Application Performance

3 Ways to Optimize Observability and Monitoring of Digital Services in the Cloud

Use DEM to Understand and Enhance Your Employees' Work-From-Home Experience

Use Synthetic Monitoring to Enhance User Experience for Hosted and SaaS Applications

Workplace Experience Apps

Analysis By: Tori Paulman, Janel Everly, Sohail Majumdar

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Workplace experience (WEX) apps support positive employee office experiences by simplifying visit planning, reserving shared and personal spaces, and identifying available amenities. They are used to explore and reserve workspaces, navigate the workplace, find colleagues, and plan the best days to attend the workplace. WEX apps enrich the hybrid work experience by integrating with digitalized physical objects, and utilizing enterprise social graphs and artificial intelligence (AI).

Why This Is Important

Delivering hybrid work at scale demands a balanced approach to space planning, a shift from location-centric to human-centric culture and investment in workplace technology. Efforts to inspire or direct employees to return on-site are driving dramatic adoption of workspace usage monitoring and real estate portfolio optimization technologies. Employee experience improvement is a priority so that employees make better use of, and feel satisfied with, their face-to-face time.

Business Impact

WEX apps should be adopted to improve:

- The working relationship between IT leaders, real estate and HR.

- Earning the commute by delivering experiences that motivate employees to visit the office. Sixty-five percent of corporate real estate leaders state that employee workplace experience is their no. 1 priority.
- Meaningful and intentional use of the office by providing capabilities that help employees and managers coordinate. Seventy-seven percent of workers want to be a part of planning how hybrid work is orchestrated.

Drivers

- Ninety-six percent of HR leaders say that their organizations have adopted or will adopt hybrid work. The diversity of approaches and challenges to implement hybrid have accelerated innovation, and mergers and acquisitions (M&As) in the workplace experience app markets.
- According to Gartner's 2022 Digital Worker Survey, 77% of digital workers want to have their hybrid work schedule planned with them.
- Improving the employee workplace experience is the No. 1 priority for 67% of corporate real estate leaders, who are working with the digital workplace team to optimize the hybrid experience.
- Seventy-five percent of corporate real estate leaders expect to use an app to manage shared seating, room scheduling and desk booking. Buyers now want holistic workplace experiences via intentional visit planning, wayfinding, and automating via virtual assistants.
- Employees want a hospitable experience at the office, control over their proximity to colleagues, information about the number of people in the office, and personalization of their environment (air quality, etc.).
- Artificial intelligence (AI) and machine learning (ML) are being used to automate employee interactions, and provide actionable insights to workplace leaders for rightsizing portfolios.
- WEX apps must integrate with "things" like smart badges, customizable environmental controls (HVAC), digital signage, furniture, lockers, mobile devices and wearables to improve employee experience. They assist employees to check into desks, call an elevator or adjust temperature/lighting.
- WEX apps deliver insights into the number of employees and visitors who plan to occupy the office and integrate those insights with location sensors to monitor real-time occupancy. These capabilities provide facility leaders with critical cost avoidance and sustainability levers to adjust lighting, HVAC and shared services personnel in underutilized spaces.

Obstacles

- It's hard to acquire a one-stop-shop product for all functional needs because the needs of the hybrid workplaces across industries, regions and business units are so diverse.
- Leaders responsible for vendor assessment and capability mapping must navigate a competitive market, in which a significant number of vendor acquisitions, rapid feature evolution, and new entrants have reduced differentiation.
- Cost can be a barrier to entry due to pricing models for SaaS licenses and implementation costs for WEX apps, which vary widely and are often not budgeted for.
- Employee privacy can present a challenge to the goals of WEX apps to support an open and collaborative hybrid WEX.
- Leaders in siloed IT or real estate teams may pursue an app strategy that is redundant or duplicative.
- WEX apps offer the most value when integrated with enterprise systems (e.g., IWMS, security, network and human capital management [HCM] tech) that can significantly increase cost and labor investment.

User Recommendations

In its second year on the Hype Cycle, WEX apps have begun their descent into the Trough of Disillusionment, due to market penetration and continued challenges in supporting hybrid work.

- Navigate the WEX market by ranking the application capabilities needed to support your hybrid workplace strategy.
- Focus digital workplace strategies toward smart workspace trends by understanding vendor acquisition plans and feature roadmaps, and align those strategies with your future of work strategy.
- Gain stakeholder buy-in and reduce duplication of effort by creating a working group of IT, real estate, business and HR leaders, and employee champions to assess WEX apps.
- Avoid overprioritizing core capabilities by focusing on emerging ones, such as the ability to support employee coordination and virtual assistants.

- Organizations invested in Microsoft 365 should integrate with Microsoft by identifying their needs like open API, bidirectional calendar integration, Microsoft Teams apps and the ability to use Microsoft Graph.

Sample Vendors

Appspace; eFM; Envoy; Eptura; FlamencoTech; NFS Technology; Robin Powered; ServiceNow; Smarten Spaces; Tango

Gartner Recommended Reading

Market Guide for Workplace Experience Applications

Tool: Vendor Selection for Workplace Experience Applications

Demand to Support Hybrid Employee Experience Is Driving a Transformation of the Workplace Markets

Digital Adoption Platforms

Analysis By: Melissa Hilbert

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

A digital adoption platform (DAP) overlays applications (e.g., CRM, HCM, ERP, legacy and external) with in-application guided learning, simulations, nudging and analytics to drive adoption and engagement. DAPs improve adoption and usage supporting organizations' digital transformation objectives. They provide consistent user experiences that help users complete work efficiently. A DAP also offers analytics driving actionable insights to improve experience and streamlines work, improving ROI.

Why This Is Important

DAPs improve user productivity and efficiency, reducing digital friction and increasing user engagement and employee retention. Key employee use cases appear in sales, HR, ERP and digital workplace, but this technology applies to all functional areas in an organization. For external use cases where your company sells software, consider embedding a DAP to improve customer experience and loyalty. Use cases include onboarding, technology adoption and use, change management and process efficiency.

Business Impact

DAPs provide high value for organizations looking to improve adoption of applications for employees and customer experience. The ROI of DAP can be measured by:

- Reducing employee onboarding and training costs
- Speeding new-hire time to productivity
- Eliminating change management related training
- Reducing support tickets
- Improving user engagement, proficiency and efficiency
- Minimal setup and low administrative overhead
- Usage analytics and insights enabling continuous improvement
- Improved CSAT scores

Drivers

Digital adoption platforms are relevant for any organization in any vertical. The most prominent application employee use cases to date include where sales force automation (SFA), HR, ERP, procurement or digital workplace solutions are used.

- The solutions in the market have evolved to include platform capabilities, such as the use of partner ecosystems.
- The need for cross-application guidance and analytics is critical to digital transformation and improved employee experience.
- DAPs also address the need for multiple device types such as mobile, desktop, hybrid, web and on-premises hosted applications.

- Additionally, they are relevant for organizations selling software where user adoption and usage are critical to customer value realization, renewals and expansion.
- DAPs drive actionable insights to improve the user experience and maximize ROI from application investments.

Organizations should seek this technology if they are facing the following challenges:

- There is poor adoption of existing applications or high churn or growth of employees.
- Tasks are complex within an application.
- Tasks are performed infrequently but have high organizational impact.
- Business processes are changing frequently and knowledge management is difficult.
- An application changes frequently.
- Customers' end users using your software have low engagement where adoption is closely correlated to renewal or growth.

Obstacles

- On-premises applications behind firewalls are more difficult for some vendors to connect to and will be more costly to deploy while also losing some analytics.
- Mobile application support is weak from many vendors; some do not offer it at all.
- Language translation for content varies greatly among vendors.
- 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.
- Some vendors do not support cross-application guidance and analytics.
- Governance and new DAP roles for guidance, content creation and maintenance are required, as well as a partnership between product, customer success and IT teams.

User Recommendations

- Create a plan by functional area to incorporate DAP by prioritizing high-impact applications such as CRM, ERP, HCM or client-facing applications across the entire tech stack or product portfolio.
- Evaluate all applications for an employee's work hub by documenting all applications used to get work done by an employee.
- Ensure analytics are deep at both a macro (aggregate) and a micro (workflow) level and can cross applications for a single workflow.
- Investigate multilanguage capabilities for application and content support.
- Design a governance plan by including new DAP roles or reallocation of learning and development (L&D) or subject matter expert (SME) roles to support content and a rollout across the organization.

Sample Vendors

AppLearn; Apty; Knowmore; myMeta; Pendo; SAP; tts; Userlane; WalkMe; Whatfix

Gartner Recommended Reading

Market Guide for Digital Adoption Platforms

Toolkit: Job Descriptions for the Digital Workplace

Tool: Guide to Selecting Digital Adoption Platform Vendors

Create an Enablement Continuum to Advance Digital Skills Outside of IT

Hyperautomation

Analysis By: Frances Karamouzis, Keith Guttridge, Laurie Shotton, Saikat Ray

Benefit Rating: Transformational

Market Penetration: More than 50% of target audience

Maturity: Mature mainstream

Definition:

Business-driven hyperautomation is a disciplined approach that organizations use to rapidly identify, vet, and automate as many business and IT processes as possible. Hyperautomation involves the orchestrated use of multiple technologies, tools or platforms to achieve business results. These include, but are not limited to, AI, machine learning, event-driven software architecture, robotic process automation (RPA), iPaaS, packaged software and process/task automation tools.

Why This Is Important

The primary reason that hyperautomation is critical is the unrelenting demand for accelerated growth through business model innovation or disruption, coupled with the underlying foundation of operational excellence across processes and functions. This is important as organizations continue to focus on business outcomes such as higher quality, more resilient processes, and higher usage due to employee- and customer-centric experiences, among others.

Business Impact

The most important business impacts are aligned to business outcomes such as cost optimization, growth, business agility or innovation. Hyperautomation initiatives are fluid enough to align to one or all of these outcomes. Examples of results may be better (higher quality, more resilient) business or IT processes, speed (time to market, cycle time reduction and quicker adoption) or intelligent (data-driven) decision making at scale.

Drivers

- The biggest driver of hyperautomation is funding from business units (as opposed to the IT budget). These business units continue to hire and fund initiatives driven by fusion teams and business technologists.
- The continued unabated spending on hyperautomation initiatives is forecast to exceed $1 trillion in 2023. This includes spending on products (software, platforms and tools) coupled with services spending on consulting, system integration and managed services.
- Additionally, there have been five successive years of capital investment of $1 billion or more in vendors that can be attributed to the various technology categories that enable hyperautomation initiatives.
- The increased investment has fueled the growth of offerings with expanded breadth and depth within the vast vendor landscape (both organic growth and through acquisitions).

Obstacles

- **Lack of measurement of quantifiable value:** Only a few organizations (estimated at less than 20%) have mastered the measurement of hyperautomation initiatives.
- **Lack of planning for total cost of ownership (TCO) or governance:** The explosion of funded hyperautomation initiatives, coupled with the need for speed, often leaves unaddressed the all-important planning for post-production-managed operations and governance structures.
- **"Siloed" approach:** The ubiquity of hyperautomation has led to an incredible volume and velocity of adoption across functions. Unfortunately, the concurrent nature across business functions has been executed via "siloed" or diffuse purchases of technology tools, solutions and platforms.
- **Technology confusion and overspend:** There is no single vendor or technology that will enable hyperautomation initiatives. Highly fragmented and overlapping technology markets have resulted in complex architectures, overspending and lack of enterprise orchestration.

User Recommendations

- Define shared ownership and metrics. Focus on regular intervals for measurement and updates. The leading organizations in the world ensure this involves finance to facilitate public reporting of success.
- Maximize the likelihood of successful hyperautomation initiatives by architecting and planning multiple concurrent initiatives. Demand holistic mapping of collective initiatives, rather than siloes within specific functions.
- Recognize that the technology is not trivial as there is no single vendor or technology that will enable hyperautomation initiative. Focus on modularity and discoverability in the design. Take an API-first approach.
- Ensure appropriate investment in vendor management and risk competencies due to the volume of services and technologies involved.
- Establish and curate an adaptive governance structure with the goal of managing risk, and driving operational resiliency and agility while optimizing TCO.

Sample Vendors

Automation Anywhere; Boomi; Celonis; Microsoft; OutSystems; SnapLogic

Gartner Recommended Reading

The Gartner 2023 Predictions: Hyperautomation (Inclusive of AI, RPA & Low Code)

The Executive Guide to Maximizing Hyperautomation

Future of Work Trends: Hyperautomation Growth Initiatives Delivered by High-Performance Fusion Teams

Cloud ERP for Global Enterprises

Analysis By: Dixie John

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Cloud ERP for global enterprises is defined as the adoption of SaaS ERP suites by companies that operate across multiple regions with annual revenue above $5 billion. These companies usually search for an ERP suite to operate globally with little latency and provide localization features. The solution must also offer access to a flexible application platform that will enable last-mile extensions to cover different geographical and local business execution priorities.

Why This Is Important

Interest in cloud ERP for global enterprises varies across different business domains. For example, most organizations are highly interested in cloud human capital management (HCM) adoption, while only a few are pursuing cloud ERP adoption for complex manufacturing or more individualized environments. Cloud ERP still represents an opportunity to adopt modern technology with lower initial investments. It persists as a component of strategic assessments as aging legacy applications reach their end of life.

Business Impact

As enterprises commit to a global culture of change, some capabilities in their portfolio shift to standard, enabling the creation of a leaner core ERP. There is a paradigm shift between vendor and customer, where in exchange for rents of the software, the customers get a continuous stream of improvements and ability to gain value quicker from innovation. Vendors have increased investment in AI, machine learning, UX customization and regional data center expansion to support global enterprises.

Drivers

- Lower cost of implementation, faster time to benefit, technological and business scalability, reduced cost of upgrades and lower capital expenditure, when best practices are followed.
- Global enterprises that are able to adopt cloud ERP through a standard set of application capabilities may benefit from quicker global rollout (compared with the traditional on-premises model) and advantages that come with advancement in localization offerings.
- Enterprises seeking to enable a tiered ERP approach may find that cloud ERP is an option that will minimize the need to set up a fully fledged support team for different applications. This will reduce the overall complexity and costs of application and infrastructure management.
- The standardized nature of the cloud approach provides a fit-to-standard approach in particular for system-of-record capabilities.
- Given the divergence of use cases for cloud and on-premises solutions (for example, SaaS for finance, with on-premises for manufacturing), cloud ERP solutions are considered to deliver a two-tier ERP strategy.
- If proper adjustments are made to the governance, support, business integration model and application platform integration (aPaaS), enterprises may benefit from the continuous improvement of the cloud ERP-scoped capabilities as a basis to deliver other unique solutions.

Obstacles

- Global enterprises need to build adequate support models for the adoption of new ERP features while enforcing global standards. This usually requires more sophisticated governance and additional investments in highly skilled personnel, automated testing and/or engagement with application managed services.
- Government policies and regulatory compliances create additional constraints on data residency, protection and sovereignty status where ERP vendors do not have access or qualify to operate. Additionally, mature localized cloud ERP offerings are not available in all countries, which leads to a slower adoption rate in certain regions.
- Lack of dependable telecom infrastructure is still a strong inhibitor in certain geographies.
- Many customers are still averse to lack of control over forced maintenance and updates from cloud ERP providers, which may arise during critical business moments.

User Recommendations

- Evaluate the adoption of cloud ERP as a strategic move to enable innovation and modernization of business operations, rather than upgrading or replacing legacy systems. For instance, deliver via cloud ERP a central supply chain control tower connected to legacy manufacturing instances.
- Examine potential issues that may arise from technological and legal constraints in certain regions (including internet access and reliability, and rules about data residency). Evaluate the architectural capabilities to overcome those challenges.
- When selecting global ERP, ensure the vendor is responsible for keeping the ERP compliant with local regulations as part of the release management procedures. Plan for the fact that ERP vendors do not guarantee the fulfillment of future release roadmaps.
- Evaluate whether a two-tier ERP strategy is the best fit to promote regional or particular business operation coverage, as opposed to a single solution that may be too complex to deploy globally.

Sample Vendors

Infor; Microsoft; Oracle; SAP; Workday

Gartner Recommended Reading

Two-Tier ERP: A Useful, Composable ERP Strategy for Complex Organizations

2022 Strategic Roadmap for ERP

6 Steps to Choose the Best-Fit Cloud ERP Solution for Your Organization

Magic Quadrant for Cloud ERP for Product-Centric Enterprises

Magic Quadrant for Cloud ERP for Service-Centric Enterprises

Appendixes

See the previous Hype Cycle: Hype Cycle for the Future of Applications, 2022.

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 2023)

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 2023)

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 2023)

Document Revision History

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Hype Cycle for Advanced Future of Applications, 2019 - 5 August 2019

Recommended by the Authors

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

Transform the Digital Employee Experience with an Evolving Digital Workplace

Generative AI: The Basics (Shareable Slides)

Evolve Self-Service Analytics for the Era of Generative AI

Quick Answer: How Does a Superapp Benefit the Digital Employee Experience?

Quick Answer: When Will Organizations Adopt Autonomic Technology and Business?

Table 1: Priority Matrix for the Future of Applications, 2023

Benefit ↓	*Years to Mainstream Adoption*			
	Less Than 2 Years ↓	***2 - 5 Years*** ↓	***5 - 10 Years*** ↓	***More Than 10 Years*** ↓
Transformational	Digital Employee Experience Hyperautomation	Collaborative Workflow Automation Conversational User Interfaces Decision Intelligence Workplace Experience Apps	Autonomic Systems Customer Technology Platform Emotion AI Responsible AI Self-Integrating Applications	
High	Digital Work Hubs Generative AI-Enabled Applications Visual Collaboration Applications	AI TRiSM Augmented Analytics Cloud ERP for Global Enterprises Composable Applications DEX Tools Digital Adoption Platforms Digital Experience Monitoring Generative Analytics Experience	Cloud-Native Collaborative Content Workspaces Intelligent Platforms Superapps	Workforce Nudgetech
Moderate			Analytics Collaboration Multiexperience UI	
Low				

Benefit	*Years to Mainstream Adoption*			
↓	***Less Than 2 Years*** ↓	***2 - 5 Years*** ↓	***5 - 10 Years*** ↓	***More Than 10 Years*** ↓

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