# Hype Cycle for Workforce Transformation, 2023

Organizations face intense pressure to adapt their workforce to meet new strategic and operational talent needs. This Hype Cycle is essential for workforce planning and strategy discussions for executive leaders who want to transform their workforce to be fit for current and future purposes.

**More on This Topic**

This is part of an in-depth collection of research. See the collection:

- 2023 Hype Cycles: Deglobalization, AI at the Cusp and Operational Sustainability

## Analysis

### What You Need to Know

This Hype Cycle includes innovations to optimize and transform the capabilities within your workforce, separating hype from reality when it comes to much-needed talent transformation.

CHROs can use this research to identify the highest-impact innovations for the organization's talent priorities. This research can serve as an input to workforce planning, talent strategy development and workforce management.

Executive leaders can use this research to discuss talent transformation options with their HR business partners, to develop sustainable strategies for creating the workforce they will need to meet their immediate and long-term strategic goals.

The innovations highlighted in this Hype Cycle provide guidance on the talent and business impacts of workforce transformation tools and strategies. The recommendations for using the innovations will help organizations to drive greater efficiency and productivity as well as to create competitive differentiation in the talent market.

Additional relevant Hype Cycles include:

- Hype Cycle for Hybrid Work, 2023

- Hype Cycle for HR Transformation, 2023

- Hype Cycle for Frontline Worker Technologies, 2023

### The Hype Cycle

This Hype Cycle distills insights from many other Hype Cycles we produce into a succinct set of must-know innovations that are actively changing the workforce. This Hype Cycle is most crowded toward the Peak of Inflated Expectations because the shift toward hybrid work models, business model evolution and talent shortages have accelerated demand for scalable ways to adapt existing workforces to be more fit-for-purpose, creating more entrants to the market.

The innovations showcased in this Hype Cycle fit into four categories:

- **Changing who (or what) does work** — These tools allow organizations to transform the workforce by automating tasks to free up workers for more value-add responsibilities by enabling internal and external candidates to find opportunities or by facilitating the use of nontraditional employment models. These include:

  - Digital twin of the employee

  - External workforce procurement

  - Internal talent marketplace

  - Autonomous things in manufacturing (and other industries)

  - Citizen developers

  - Digital credentials

  - Next-gen talent assessments

- **Changing how work is done** — These innovations transform the workforce by changing workflows, particularly by augmenting human workers' abilities to increase productivity, output quality and/or worker well-being. These include:

  - Generative AI-enabled applications

  - Connected factory worker

  - Everyday AI

  - Responsible AI

  - Hyperautomation

  - Immersive experience

  - Workforce nudgetech

  - Augmented reality

- **Changing the skills available within the workforce** — These tools can be used to increase the skills available within your current workforce via upskilling, prepare workers for new roles via reskilling and optimize your use of the skills currently available within the workforce. These include:

  - AI-enabled skills management

  - Coaching/mentoring applications

  - Frontline worker EX tech

  - Agile learning

  - Collaborative work management

  - Digital side hustle

  - Virtual reality

- **Changing where and when work occurs** — These innovations transform the workforce by expanding who has access to work to include those who cannot or would not work a traditional in-office nine-to-five role. These include:

  - Hybrid work

  - Radical flexibility/flexible work

  - Four-day workweek

  - Next-gen workforce management

  - Global employer of record solutions

**Figure 1: Hype Cycle for Workforce Transformation, 2023**

Hype Cycle for Workforce Transformation, 2023
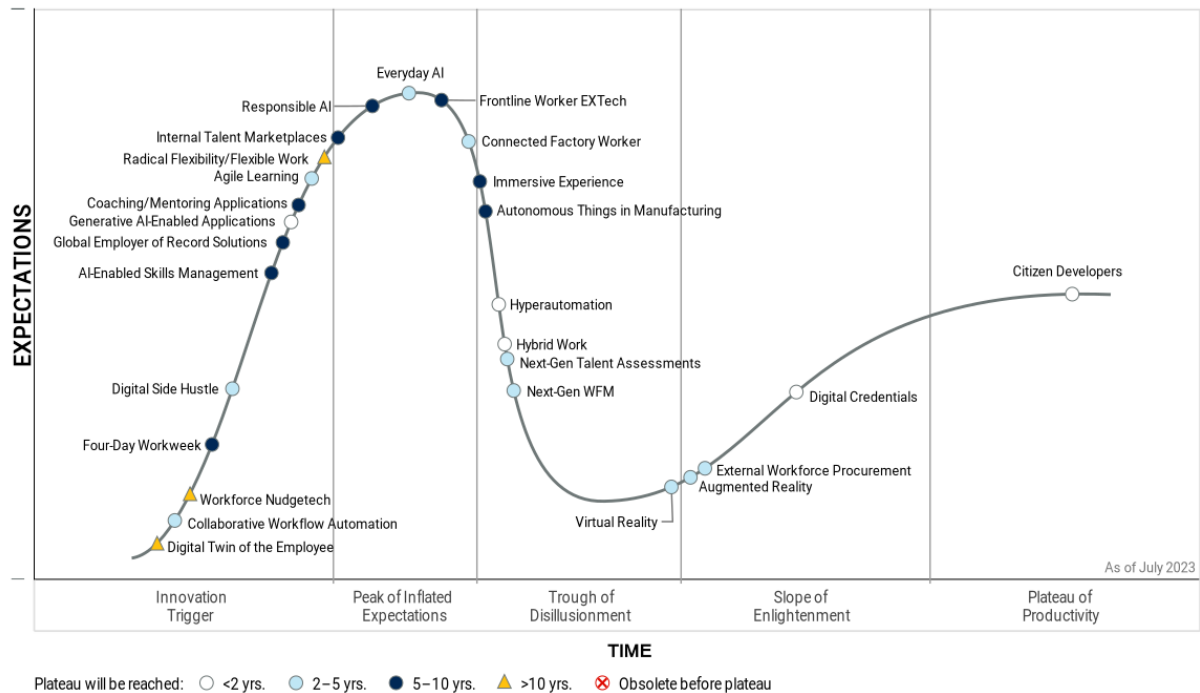


## The Priority Matrix

The Priority Matrix maps the innovations to the time frame by which they are expected to mature into mainstream adoption and deliver benefits, as well as the level and depth of benefits that can be expected from them. As an CHRO or executive leader, you must evaluate these innovations' transformational potential for your workforce as well as how fast your organization can achieve its strategic goals.

CHROs should incorporate the impact of high and transformational innovations that will become mainstream in the next five years into their talent strategy. Hyperautomation, hybrid work, generative-AI-enabled applications and next-gen workforce management will have significant and difficult to avoid impacts. CHROs who prioritize these innovations in their planning will be able to recruit scarce talent while also creating a competitive advantage via efficiency and productivity gains.

CHROs and executive leaders should also look for opportunities to pilot less mature innovations with high alignment to the organization's strategic and operational priorities. For example, AI-enabled skills management will enable greater organizational agility, and responsible AI and autonomous things in manufacturing will reduce safety and operational risks (also insurance costs). Innovations such as digital credentials and global employer of record solutions may address some issues arising from critical talent shortages. In addition, radical flexibility/flexible work, four-day work week and internal talent marketplace solutions provide opportunities to improve employee experience and reduce burnout.

**Table 1: Priority Matrix for Hype Cycle for Workforce Transformation, 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 Credentials Hybrid Work Hyperautomation | Collaborative Workflow Automation Connected Factory Worker Digital Side Hustle Everyday AI | Internal Talent Marketplaces Responsible AI | Radical Flexibility/Flexible Work |
| High | Citizen Developers Generative AI-Enabled Applications | Agile Learning Augmented Reality Next-Gen WFM | AI-Enabled Skills Management Autonomous Things in Manufacturing Coaching/Mentoring Applications Four-Day Workweek Frontline Worker EXTech Global Employer of Record Solutions | Digital Twin of the Employee Workforce Nudgetech |
| Moderate | | External Workforce Procurement Next-Gen Talent Assessments Virtual Reality | Immersive Experience | |
| Low | | | | |

Source: Gartner (July 2023)

On the Rise

**Digital Twin of the Employee**

**Analysis By:** Jason Wong, Helen Poitevin

**Benefit Rating:** High

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

**Maturity:** Embryonic

**Definition:**

A digital twin of an employee (DToE) is a model you build to understand how real employees will respond or behave in a given context. It's a dynamic, virtual representation of an employee that simulates and learns to emulate and anticipate employee behavior. The DToE is usually based on employee personas, but in some instances, it could be directly linked to an individual employee for specific purposes that benefit the worker.

**Why This Is Important**

Digital twin technologies support the optimization of digital business. Data about assets, processes, customers, organizational operations and even cities are being virtualized as digital twins to drive better insights and decision making. A DToE is a missing piece in the puzzle for organizations that want to pursue better performance, productivity and impact through a combination of work optimization, autonomy, dynamic networks, quality leaders and improved employee experience.

**Business Impact**

A DToE can aid in reducing health issues and accidents for employees, particularly those working in harsh environments. It can simulate a body's interactions with its physical environment to improve safety protocols. A DToE can monitor and analyze employee performance, physically or even mentally. Consumers already do this by tracking their sleep, food intake and exercise regimen to optimize well-being. DToE helps improve individual performance and aggregate data for showing trends and shared practices.

**Drivers**

■ The support of connected employees, who already leave a significant digital footprint, will be an early driver of DToE. These employees are supported by advanced insights and point-in-time guidance to onboard and improve performance — most often in work contexts impacted by recent and significant investments in automation, changing the nature of work. For example, this will be the case for the connected rep, and the connected factory worker.

■ A DToE is needed to help improve connected employee experience by simulating which information, decisions or actions will help employees tap into intrinsic motivation and have a sense of increased mastery and competence in the execution of meaningful work tasks.

■ Employee acceptance and adoption of relevant technology, as well as assistance from works councils, labor law interpretations, and privacy regulations, will ultimately drive a successful DToE. Based on the 2022 Gartner Digital Worker Survey of digital workers from the U.S., China, India or the U.K., the top situations where employees would accept monitoring of their activities, in return for assistance are: (1) making me aware of training classes and/or career development, (2) support in finding information or data to do the job, and (3) proactive outreach from support when I'm having problems with my computer or applications.

**Obstacles**

■ Employee privacy: Organizations may choose to obtain consent, but individual employees may choose to opt out if their perception of privacy risk is greater than the reward of participation. This requires consultation and communication with employees.

■ Regulations: Workplace regulations will play a major role in shaping DToEs across regions, industries and employee segments. This requires legal awareness in each jurisdiction ahead of DToE design.

■ Data manipulation: DToE data can be misinterpreted or used in ways that negatively impact certain employees which could lead to negative outcomes for them and the organization.

■ Fragmented technologies: This capability is not a current packaged solution today. A DToE will require the implementation, integration and orchestration of multiple technologies, such as the voice of employee tools, workstyle analytics, digital employee experience tools and journey analytics.

**User Recommendations**

- Start with one DToE use case related to safety, performance or well-being which will then inform the technologies needed.

- Focus on utility for employees, where they feel they get value and assistance.

- Map the context, starting with data about work activities, sentiment, workstyle preferences and skills.

- Simulate what actions are most likely to help employees increase their performance.

- Simulate what workspace — physical or virtual — will help them perform at their best.

**Gartner Recommended Reading**

Innovation Insight: Workstyle Analytics

Market Guide for Voice of the Employee Solutions

Market Guide for DEX Tools

Market Guide for Technologies Supporting a Digital Twin of an Organization

**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?

**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

**Four-Day Workweek**

**Analysis By:** Emily Rose McRae

**Benefit Rating:** High

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

**Maturity:** Adolescent

**Definition:**

The four-day workweek is a flexibility offering that involves a reduced number of days for employees to work. It can be a reduced number of hours (i.e., 32 hours in four days) or a condensed workweek with the same number of hours in a reduced set of days (i.e., 40 hours in four days). Four-day workweek initiatives have been launched to increase flexibility offerings for both frontline workers and location-agnostic workers in various industries and geographies.

**Why This Is Important**

With an employee base that is frustrated by poor work-life balance and more accustomed to flexible working patterns, organizations are considering different ways to remain competitive and meet employee expectations. When faced with either a 10% raise at one company or a four-day workweek, 63% of candidates responding to the 2022 Gartner Candidate Survey Dashboard said they would choose the organization offering lower pay to access the four-day workweek.

**Business Impact**

- **Solutions to employee retention and burnout**. Our recent four-day workweek experiment reported a 65% reduction in the number of sick days. Moreover, 71% of employees reported lower levels of burnout, and the likelihood that an employee will quit the organization declined by 57%.

- **Substantive increases in employee productivity.** For industries and markets with strong pressure on efficiency and productivity, four-day workweeks are currently serving as key performance differentiators.

Drivers

- **Pressure for greater efficiency and productivity.** Ongoing supply chain shortages, inflation and talent shortages are forcing all organizations to do more with less. The striking productivity returns from four-day workweek pilots make implementing a four-day workweek an appealing proposition for executive leaders who need dramatic productivity improvements.

- **Talent shortage.** Well-publicized and acutely felt talent shortages are making any opportunity to increase attraction and reduce attrition worthy of at least a serious discussion. When faced with either a 10% raise at one company or an innovative benefit at another company such as a four-day workweek (for the same pay as a five-day workweek), 63% of candidates we surveyed said they would choose the organization offering 10% lower pay but that offers the four-day workweek as an innovative benefit.

- **Fear of being left behind.** Many executives do not believe their organizations could possibly implement a four-day workweek, but they remember thinking the same thing about remote work and being proven very wrong by necessity. Employee preferences for ever-increasing flexibility act as a driving force for executive interest, even in the absence of a world-changing event.

- **Employee demand for flexibility.** Employers mandating rigid work arrangements are facing a significant risk to an organization's employee hiring, engagement, performance, well-being and retention strategies. They are looking to the four-day workweek as an alternative way of delivering flexibility to employees.

- **Reduced costs due to accidents, insurance and safety risks.** Four-day workweek trials have shown that in supply chain and construction, the four-day workweek with reduced hours significantly reduces the rate of employee accidents and injuries. This saves time lost to accidents, insurance costs due to higher rates of injury and reputational damage that can occur if a workplace is known for being unsafe.

**Obstacles**

- **Change fatigue.** Many organizations feel it is too soon to implement a four-day workweek after such major changes to the workforce from the COVID-19 pandemic.

- **Leader buy-in.** Some leaders are skeptical of ways of working that differ from what is familiar to them.

- **Productivity.** Despite study results to the contrary, some leaders are concerned that four-day workweeks would harm productivity ( The Results Are In: The U.K.'s Four-Day Week Pilot, Autonomy).

- **Coverage and business continuity.** When operations require full coverage and maintaining operations, organizations may need to increase headcount so they can implement a four-day workweek without risking coverage.

- **Regulatory barriers.** Regulations, laws and/or union agreements may make implementing a four-day workweek challenging for some organizations.

- **Risk of employee burnout.** For organizations that cannot implement a reduced workweek for regulatory reasons, a condensed workweek will increase the possibility of overwork, burnout and injury in the workforce.

**User Recommendations**

- Provide a potential alternative to hybrid for leaders who are not comfortable with remote work and want their knowledge workers back in the office. With changing employee expectations, they may be willing to trade off remote work with one more day per week of personal time.

- Set the organization up for long-term success by implementing a gradual four-day workweek program, moving from a five-day workweek to four-and-a-half days before four. This will combat change fatigue.

- Assess your current workforce to decide whether a reduced or condensed workweek would be best for your workforce without disruption.

- Anticipate the executive board's concerns about implementation and propose this as a business decision that aligns with company goals, rather than an HR initiative. Use the program as a solution that helps achieve organizationwide goals.

## Digital Side Hustle

**Analysis By:** Joe Mariano, Matt Cain

**Benefit Rating:** Transformational

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

**Maturity:** Adolescent

**Definition:**

A digital side hustle is a strategy to help interested employees master new technologies to boost business outcomes for individuals and the broader team. Using a grassroots approach, a side hustle can allow driven employees to take advantage of their natural inclination to expand and improve their technical skills, leading to increased digital proficiency and the possibility of them transitioning into a business technologist position.

**Why This Is Important**

The digital aspects of most jobs are expanding, and future organizational prosperity depends on employees' ability to take full advantage of the technologies provided to them to deliver business outcomes.

**Business Impact**

By empowering employees through digital side hustle programs, organizations have seen significant resource and cost-efficiency gains. These gains have included employees creating applications that have reduced the need for paper, saved significant costs and streamlined work processes.

**Drivers**

- Career development and growth opportunities are the top factors influencing employee engagement and attraction to their roles.

- Ensuring that employees can connect the need to improve their digital dexterity to their professional development goals is critical to digital skills development.

- Employees depend increasingly on the digital skills of colleagues when working remotely, exacerbating the need to build processes and social constructs to exploit constant technology disruption.

- Results from Gartner's 2022 Digital Worker Survey show that 89% of respondents consider "improvement in digital technology skills" as highly important for career advancement. In the same survey, 95% of employees cite "improvement in digital technology skills" as being critical for work effectiveness. Finally, employees satisfied with digital workplace applications are 1.6 times more likely to want to stay and grow in their current organization.

- Traditional IT-centric approaches to workforce digital enablement have failed to keep pace with technology change. Digital business skills are becoming increasingly critical, and a digital side hustle program helps employees see how their digitally enabled activities directly support the goals of the organization, such as: creating dashboards to help employees find the best sources of data, eliminating repeatable and mundane work tasks through automation tools, running meetings that employees want to attend and putting AI to work for the team.

**Obstacles**

- A key reason the gap between digital tool growth and workforce digital dexterity continues to widen is that leadership has not prioritized digital skills.

- Leadership does not have a good understanding of the technology skills that business employees currently have.

- The most popular suites of team collaboration tools release hundreds of feature updates a year, with little notice or information on what they do. This can cause IT teams to struggle to keep up with change without the resources for more proactive approaches to skills development, such as a digital side hustle program.

- The lack of coordination between IT and HR for digital enablement can create friction.

- Team managers are afraid of losing talent to work on things that are not their primary job.

- Sustainability of side hustles can initially be difficult until the value is recognized.

**User Recommendations**

- **Determine your side hustle goals:** Side hustles should reflect organizational needs. There can be a finite number of side hustles with different goals, such as improving meeting effectiveness or working toward rollout of a new collaboration tool.

- **Identify IT resources to guide initial side hustlers:** The side hustle program requires a minimum of IT oversight. The digital workplace team should take the lead to ensure that learning content is fresh and intuitive, track participation and progress, and offer course correction when needed.

- **Articulate the value to middle managers:** Focus on interest first; determine the employee's aptitude based on their technical and nontechnical competencies. An alternative model allows employees to participate in a side hustle program rather than being nominated by managers.

- **Connect side hustlers with relevant work and teammates:** Once side hustlers start to grow their skills, they need to identify opportunities to apply the learning within their own work activities. Managers must ensure employees can carve out time to focus on the side hustle (typically no more than 10% to 15% of their time).

- **Make digital side hustles self-sustaining:** As side hustlers mature in their skills, build communities of practice around each side hustle. This grassroots program helps digital side hustlers become self-sustaining, limiting the need for IT's involvement by engaging mature side hustlers with aspiring new side hustlers.

**Gartner Recommended Reading**

Create an Enablement Continuum to Advance Digital Skills Outside of IT

Quick Answer: How Can I Empower Ambitious Employees to Grow Digital Skills?

Case Study: Employee Development Framework for Digital Transformation (VDOT)

Case Study: Kick-Starting a Low-Code/No-Code Community of Practice (Heathrow Airport)

**AI-Enabled Skills Management**

**Analysis By:** Helen Poitevin

**Benefit Rating:** High

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

**Maturity:** Emerging

**Definition:**

AI-enabled skills management is a foundational capability within talent and day-to-day work contexts that applies natural-language processing, knowledge graphs and other AI techniques to build a dynamic representation of skills data. It is used to automate skills inference for people, content, work tasks, career paths and jobs.

**Why This Is Important**

Skills are described as the new currency for talent. They are a foundational element for managing the workforce within any industry. Improved and automated skills detection and assessment allow for significantly greater organizational agility. In times of uncertainty, or when competition is fierce, organizations with better skills data can adapt more quickly and be more dynamic in acquiring and deploying talent.

**Business Impact**

Properly architected and deployed AI-enabled skills management improves the following:

- Productivity and capacity utilization when used to prioritize and distribute work assignments.

- Quality of hire when used to match internal and external candidates to open positions.

- Strategy execution when used to support continuous strategic workforce planning activities.

- Impact of reskilling and upskilling initiatives when used to automate learning and career path recommendations.

**Drivers**

Although adoption progress is somewhat hampered by data complexity and technical constraints, interest in AI-enabled skills management has increased due to the following:

- The increasing pace of degradation of skills within roles and emergence of new roles.

- Geopolitical and other disruptions increase uncertainty for many organizations. This drives the need for more visibility into skills in order to plan and respond effectively.

- Digital transformation and automation efforts that change the skills footprint in many professions.

- The impact of AI and automation on jobs, and the use of skills models to forecast further impacts.

- Increasing use of AI in matching talent to job opportunities in talent acquisition systems and internal talent marketplaces.

- Changing hiring patterns from location-based to skills-based for many types of roles in many geographies.

- Tight labor markets where organizations can benefit from tapping into AI-enabled and skills-based labor market insights in support of recruiting and workforce planning efforts.

- Increased demand for using skills data to automatically tag and recommend learning content.

- Increased need for visibility into skills and knowledge in order to more easily find and connect with experts across teams in hybrid work environments.

- Improvement in availability and maturity of graph techniques and technologies.

- Improvement in natural language processing techniques to automatically detect and infer skills data in unstructured text, in multiple languages.

**Obstacles**

Technical and organizational obstacles include:

- Access to sufficient data about what work is done, to better codify skills. Data from HR systems is often low in detail. Internal data is often difficult to access and is inconsistent.

- Insufficient progress in natural language processing techniques for skills and proficiency inferences across highly varied datasets.

- The amount of processing power needed for the most detailed and complete skills ontologies.

- Standards and language to describe the same skill varies significantly across contexts.

- Skills data can be complex to visualize and analyze.

- Too many skills approaches from too many providers, and difficulties in sharing data and models across systems.

- Readiness to think of jobs and the organization of work in terms of skills.

- Fear that the skills inferences show inaccurate information. Desire to more tightly control the validation and assessment of skills.

- Attachment to existing, and less-detailed, competency frameworks.

**User Recommendations**

Application leaders transforming HCM should:

- Identify data sources that can be used to enhance skills detection and inference. This is essential if you are building your own skills graph. This is also important if you are working with a provider with their own skills ontology, who also allows you to add organization-specific skills and knowledge.

- Plan on leveraging AI to identify, infer and track skills instead of relying on competency libraries or time-consuming manual skills updates. Plan how employees can interact with skills data to improve quality over time.

- Leverage labor market analytics with in-depth skills analysis and forecasts to enhance and improve your strategic workforce planning efforts. Use this data to benchmark internal skills forecasts against broader market trends.

- Check your current vendor roadmaps for inclusion of skills data in their platforms across HR domains, and their use of AI.

**Sample Vendors**

Eightfold AI; Gloat; JANZZ.technology; Lightcast; Phenom; Reejig; retrain.ai; SkyHive; TechWolf; Visier

**Gartner Recommended Reading**

Innovation Insight for AI-Enabled Skills Management

Future of Work Reinvented: Shifting Talent and Skills

Workforce Planning — How to Use Technology to Support Planning Processes

**Global Employer of Record Solutions**

**Analysis By:** John Kostoulas, Nicole Paripurana

**Benefit Rating:** High

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

**Maturity:** Emerging

**Definition:**

Global employer of record (EoR) solutions help organizations hire and manage workers in a new geography, without the latter having to set up a legal entity in each country. The EoR provider becomes the full legal employer of the workforce and assumes all employer-related responsibilities and tasks on behalf of their customers.

**Why This Is Important**

Global EoR solutions are quintessential when organizations seek to quickly expand in new markets without having to incur the upfront cost of setting up a legal entity and hiring people to perform HR and other administrative activities. More recently, talent shortage around specific skills (e.g., technology, programming, graphic design) and broader adoption of remote work enabled organizations to broaden their talent reach beyond their existing or planned operations and associated legal entities.

**Business Impact**

The most important piece of business impact is legal compliance. Organizations do not need to spend time understanding and applying various country-specific legal frameworks that only apply to a few workers at a time. In addition, their expanded outreach for talent is beneficial to quickly acquire critical skills and enhance diversity (often at a lower cost too). Finally, organizations can offer more options for flexible work locations to all employees, when the nature of the job allows, which increases employee engagement and retention.

**Drivers**

■ **Scarce skills give rise to borderless talent**: Recruiters increasingly embrace borderless recruiting in response to these changes in the global market for talent and continuing skills shortages in the market. As per the 2022 Gartner Borderless IT Workforce Survey, most executives (85%) express interest in working with a borderless workforce, with 58% having actually implemented such a model to some extent. The pandemic is clearly an accelerator of borderless hiring, recently reflecting a significant increase, with 31% of organizations reporting adoption during the past three years up from 25% reporting adoption more than three years ago.

■ **Rise in demand for flexibility:** In the 2022 Gartner Candidate Survey, when comparing job offers, candidates are likely to give up an offer with a 10% pay increase for an offer with greater flexibility in when they work (51% of employees) and where they work (47% of employees). And when location flexibility is combined with other flexibility aspects and broader autonomy over work (human-centric work model), it is 3.8 times more likely for an organization to have high employee performance, 3.2 times more likely to have high intent to stay and 3.1 times more likely to have low fatigue than when these aspects of human-centric work are not present.

■ **Volatile economic and political conditions call for agile business expansion strategies**: Gartner research shows that 77% of enterprises now review their strategy at least twice per annum, with 37% adjusting their strategy at least twice yearly. New market expansion or operating model changes are often on the table, but these activities need to be executed quickly while optimizing the associated cost base. Alternatively, the decision to withdraw from or downsize presence in specific markets is often unavoidable but can incur significant costs due to existing legal and administrative setup when an entity is owned versus the accommodation offered by an EoR.

**Obstacles**

- Organizations often fail to create the same conditions for employee experience, inclusion and belonging as with those workers they directly employ. This impacts the engagement and retention of EoR-managed workers.

- While all providers manage legal compliance and administrative aspects, organizations often need extended capabilities in recruiting, onboarding, compensation or other aspects of employment that an EoR may not support appropriately.

- In addition, providers often depend on in-country partners for some services (e.g., payroll services). When in-country partners are not seamlessly integrated, the result is suboptimal service and employee experience.

- Typically, global EoR providers would use their own proprietary platforms to manage administrative activities in their service scope, while the employer organization would use other systems for performance management, talent management and daily work. This variance creates risk of inconsistent HR support or employee experience and gaps in related workforce/talent insights.

**User Recommendations**

- **Define workforce needs in connection with business requirements:** Tight connection between business planning and workforce planning is critical to spot cases where a global EoR needs to be considered early. For example, the scarcity of talent to fulfill specific roles is often underestimated during planning.

- **Consider the plan and subsequent steps in the evolution of global EoR usage to gradual establishment of an owned entity:** Very often, utilizing the services of a global EoR provider is a temporary step until a specific employee threshold (typically around 50-100 employees) is reached to set up a local legal entity. It is important to have such checkpoints included in your roadmap and your contractual process with the providers (e.g., minimum scope or contract early termination clauses).

- **Define your service priorities and map them to the operational model of each provider:** Having clarity in what scope of services matters to you the most (e.g., payroll compliance vs. recruitment) will make the global EoR selection and ongoing partnership more harmonious and operate with less friction.

**Sample Vendors**

Atlas Technology Solutions; Deel; Globalization Partners; Lano Software; Neeyamo; Omnipresent Group; Papaya Global; Remote Technology; Safeguard Global; Velocity Global

**Gartner Recommended Reading**

Market Guide for Multicountry Payroll Solutions

Define Your Borderless Entry Strategy to Attract Scarce Technical Talent and Address Skills Shortages

9 Steps to Improve RFP Effectiveness and Optimize HR Outsourcing or Implementation Vendor Proposals

## Coaching/Mentoring Applications

**Analysis By:** Laura Gardiner

**Benefit Rating:** High

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

**Maturity:** Emerging

**Definition:**

Coaching and mentoring applications provide a set of tools to maximize the effectiveness of a corporate mentoring or coaching program. These tools are used by the two sides of the coaching/mentoring arrangement (coaches/learners, mentors/mentees), as well as by HR and line managers.

**Why This Is Important**

Coaching and mentoring applications enable the optimal program, matchup, execution of sessions, auxiliary resources and reporting/analytics. As use cases quickly expand to include diversity, equity and inclusion (DEI), reverse mentoring from early career employees and entire teams or new hires, so does the importance of scalability and the need for technology support.

## Business Impact

The democratization of coaching/mentoring can be transformational for the development and engagement of the workforce. Therefore, we expect these programs to expand rapidly and become a substantial part of the development cycle for the entire workforce. For areas such as middle management, coaching/mentoring can soon become a standard expectation from employees, but expectations are gradually increasing across both individual contributor roles and within teams.

## Drivers

- Coaching and mentoring have been applied in the corporate world for years, but with a narrow focus (typically covering senior executives) and through internal resources, small service firms or individuals. The last few years have seen increasing demand to expand mentoring and coaching across the workforce, particularly for middle managers. This is often referred to as the democratization of coaching/mentoring.

- With permanent remote and hybrid working arrangements in place, coaching and mentoring have now become essential for employee connectedness and belonging. However, these programs can be susceptible to proximity bias with consequences for the inclusion of diverse employees in coaching and mentoring programs.

- As formal and informal coaching and mentoring programs are increasingly used for development, they must be integrated into the overall development process.

- HR is facing challenges to ensure the scalability of corporate coaching and mentoring programs. These now include thousands of potential matchups, thousands of sessions, and a diverse range of development objectives (as well as integration into other learning, development and performance management activities).

- HR and line managers also need better metrics that display the connection between the time invested, cost and the impact of these coaching/mentoring arrangements and the overall program.

- On top of technology, organizations might require a pool of external coaches or mentors, as well as services to help with the optimal design and launch of these programs. Organizations with specific language and geographic requirements can also use these applications to connect their own pool of approved external coaches and mentors to opportunities.

### Obstacles

- Most vendors cover one of the two areas, so the category effectively contains two subsegments: one for mentoring and one for coaching applications.

- Only a few vendors have achieved scale, particularly in the mentoring subarea.

- For coaching applications, the quality of coaching services and the effectiveness of the corresponding vetting process of external coaches by the vendor are paramount.

- Gaps in regional or language coverage still exist, particularly for coaching that requires a pool of coaches per location/language.

- Reporting and analytics lack depth, which hinders HR's ability to make decisions to continue, suspend or expand coaching/mentoring programs.

### User Recommendations

- Establish scalability of the coaching/mentoring vendor solution as an important assessment criterion, as programs can quickly expand, particularly in large organizations.

- Check overlaps with incumbent adjacent vendors. Some talent management applications, and more recently human capital management (HCM) suites, include mentoring features.

- Check that vendors have a multistage vetting process for hiring coaches as well as a quality control process (including learner ratings) to use for coach retention decisions.

- Evaluate content and advice offered by the vendor to help drive quick program adoption, particularly for programs related to a specific topic (e.g., DEI mentoring and group coaching).

- Assess multilingual and regional capabilities of candidate vendors, to allow for fast expansion of your programs across multiple locations.

### Sample Vendors

BetterUp; Chronus; CoachHub; EZRA; MentorcliQ; PushFar; Skillsoft; Sounding Board; Together; Torch Leadership Labs

**Gartner Recommended Reading**

Innovation Insight: Continuous Employee Listening and Talent Management for Increased Agility

Innovation Insight for Digitally Enabled Diversity, Equity and Inclusion

Unlocking Mentoring for Development Impact

**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?

## Agile Learning

**Analysis By:** Jose Ramirez, Graham Waller

**Benefit Rating:** High

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

**Maturity:** Early mainstream

**Definition:**

Agile learning is a mindset and method of skills development, via iterative short bursts, applied in the flow of achieving outcomes that can dynamically adjust with changing needs.

**Why This Is Important**

Today's hypercompetitive labor market has increased the talent demand, heightening the need for the rapid upskilling of employees. Additionally, the future of work trends, including hyperautomation and artificial intelligence (AI)-driven applications, are accelerating skills shifts, particularly digital skills, through all roles. These trends are shortening the half-life of skills demanding agile learning to future-proof employees. Unfortunately, traditional training is often too time consuming and slow to respond to these changes and trends.

**Business Impact**

Agile learning connects learning curves with earning curves. For employees, learning advances their career, future-proofs them against change and increases their value. For an enterprise, learning fills the pipeline of dynamic skills critical to executing the organization's mission.

Agile learning helps enterprises to:

■ Positively impact business outcomes

■ Adapt rapidly to changing business needs

■ Effectively upskill and reskill employees

■ Provide a clear plan to fulfill skill needs

**Drivers**

■ Agile learning summarizes a set of principles and practices that have been emerging and coalescing in the market. Gartner research indicates that 27% of enterprises have adopted agile learning principles to achieve superior talent and business outcomes from their training investments. Agile learning organizations reported remarkable improvements over their peers in Gartner's 2020 agile learning survey. Agile learning is an imperative for organizations since the total number of skills required for a single job is increasing by 5.4% year over year.

■ Agile learning enterprises embed learning continuously into the flow of work, resulting in 9.9 times the impact of achieving learning outcomes, the highest impact ratio of any driver.

■ Agile learning enterprises devote double the time to both training and learning as nonagile organizations. Giving employees the time to learn has a 7.2 times impact on achieving outcomes.

■ Agile learning enterprises promote learning communities, which spread knowledge and skills more effectively than individual learning. Social learning has a 4.3 times impact on achieving outcomes.

■ Agile learning enterprises harness data-driven learning techniques 64% more than nonagile learning peers and report roughly twice the confidence in the effectiveness of learning measurement.

**Obstacles**

- Many leaders are unaware of the agile learning approaches that are now possible. Although learning occurs daily in organizations, it's seldom intentional, siloed or fragmented. Leaders often view learning as time away from employees' work versus being integral to highly productive work. Providing employees the time to learn can feel ambiguous, and leaders are skeptical that employees will use the time effectively. Leaders also believe they can hire new talent to fill skills gaps rather than foster a culture of learning with current employees.

- Enterprises reported that "lack of employee motivation" (where employees feel that the learning is low priority in their work) and "time constraint" (where employees are not given the time to acquire that learning) are the top barriers preventing harnessing modern learning techniques. "Can't find time to learn" prevented employees from embracing agile learning in 51% of nonagile enterprises compared to only 31% reported by agile learning enterprises.

**User Recommendations**

- Reframe learning as central to everyone's job, not time away from the job. Embed learning into the flow of activities that employees perform to deliver their outcomes.

- Factor the hybrid work environment into the design of your learning program. For example, make learning content available regardless of where and how employees are working.

- Share the agile learning manifesto with the enterprise to champion agile learning. Shape a culture that connects learning and earning curves by using its four values and eight principles.

- Engage in frequent microlearning, applied as a part of your daily work, toward achieving an important outcome. Role model agile learning for your organization.

- Integrate agile learning immediately by starting small, i.e., select a single skill to develop or a small team so that iterative changes can be made along the way.

**Gartner Recommended Reading**

Agile Learning Manifesto

Future of Work Trends: The Agile Learning Imperative

An Executive Leader's Guide to Agile Learning

At the Peak

**Internal Talent Marketplaces**

**Analysis By:** Emi Chiba

**Benefit Rating:** Transformational

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

**Maturity:** Adolescent

**Definition:**

Internal talent marketplaces (ITMs) are intelligent platforms that match internal or contingent workers to work opportunities without recruiter involvement. They provide personalized recommendations aligned to workers' unique skills and experiences. Opportunities include gigs, time-boxed projects, stretch assignments, mentoring or full-time roles. ITMs offer marketing features, matching algorithms and feedback functionality, while aligning with adaptive organizational design principles.

**Why This Is Important**

Continued market uncertainty and demand for new skills have made adaptability and resilience critical. Volatility combined with worker demands for increased mobility and development opportunities has led to the adoption of ITMs. ITMs provide organizations with valuable insight into skills and workers equitable insight into available growth opportunities. They are key to enabling adaptability, resilience and experiential learning.

**Business Impact**

Adopters of ITMs use them to:

- Understand workforces through a different lens — focused on the skills needed, rather than the role.

- Gather skills data and support talent through experiential learning and hands-on opportunities.

- Encourage and track employee development and collaboration in new ways, with a focus on skills.

- Address rapidly changing business priorities, and redeploy or reskill existing employees in order to improve organizational sustainability, while increasing employer brand appeal.

### Drivers

- **Business agility and composability:** Agile and composable organizations require more flexible deployment of workers across projects, products and other initiatives. Composable businesses are architected for real-time adaptability and resilience in the face of uncertainty. They need people with learning agility to adapt to changing skills demands. They also need to be able to align a highly networked workforce to the work that needs to get done in a dynamic way.

- **Talent visibility:** HR and other organizational leaders benefit from the data and insights from ITMs to support workforce planning and other talent processes. Team, project and product leaders within organizations benefit from more flexible staffing and improved visibility into talent.

- **Worker demand for growth opportunities**: Deployed correctly, ITMs provide employees and contingent workers with better visibility into work opportunities. They can stretch and build up their skills and experiences in order to grow their portfolio of work and careers.

- **Technology availability:** Hype around the ITM has increased. The market for these platforms consists of human capital management (HCM) suite providers, talent acquisition vendors, learning platforms and specialist point solutions. Maturity in applying AI to detect, infer and map relationships between skills has increased, as has the use of AI techniques to automatically match talent to work opportunities.

### Obstacles

Organizational challenges impeding adoption include:

- Lack of cultural readiness for more dynamic and adaptive organizational models and project- or gig-based work.

- Talent hoarding due to fear of lack of resources. Managers may discourage team members from seeking outside opportunities as they only see talent engaging in work for other teams, and fear not having enough talent to get assigned work done on their own team.

- Lack of psychological safety. Workers may not be confident enough to bid on projects or gigs for fear that they will not be selected. Uncertainty can also exist around how performance on projects will impact annual performance reviews.

Data-related challenges include:

- Access to data regarding worker and worker experiences, knowledge and skills.

- Use of organization-specific and more granular skills to enable better matching.

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

**User Recommendations**

- Pilot ITMs within business units that use adaptive or agile organization models, or work with progressive talent management leaders who want to deliver agile skills development.

- Invest in design thinking, work design and workplace ethnography. Allowing workers to bid for projects and gigs, represents a significant change to management practices.

- Inventory current skills ecosystem and data sources to decide what may feed into matches and recommendations in the ITM prior to vendor evaluation.

- Evaluate vendors by assessing user experience, ability to incorporate diverse sources of data and skills ontologies. When evaluating vendors with similar capabilities, prioritize user experience as user adoption is critical to the adoption and success of an ITM.

- Market the ITM, as it gets adopted within your organization, as an essential, growth-focused part of your differentiated employer brand.

**Sample Vendors**

365Talents; Degreed; Eightfold AI; Fuel50; Gloat; Oracle; ProFinda; SAP; Workday

**Gartner Recommended Reading**

Market Guide for (Internal) Talent Marketplaces

Innovation Insight for AI-Enabled Skills Management

Future of Work Reinvented: Shifting Talent and Skills

**Radical Flexibility/Flexible Work**

**Analysis By:** Emily Rose McRae, Graham Waller

**Benefit Rating:** Transformational

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

**Maturity:** Emerging

**Definition:**

Flexibility should extend beyond just "where" and "when" employees work. Radical flexibility — providing workers with the ability to decide how much they work, whom they work with and what they work on — not only increases employee satisfaction with an organization's employment value proposition. It also increases the percentage of high performers in teams by 40%.

**Why This Is Important**

Human-centric work designs with flexible experiences including elements of employee autonomy in work arrangement and work scheduling have a statistically significant positive impact. This results in higher employee-reported productivity, higher intent to stay, higher performance and reduced fatigue over nonflexible experiences.

**Business Impact**

Most organizations are interested in radical flexibility for its attraction and retention impact. However, when organizations deliver radical flexibility — compared with delivering flexibility only in when and where employees work — the percentage of employees who are defined as high performers increases by 40%.

**Drivers**

- **Talent shortage:** Difficulty retaining and attracting talent, particularly talent with scarce skills, has driven more and more organizations to consider increasing their flexibility offerings, especially if they are unable to compete on compensation.

- **Greater demand for autonomy:** Most organizations offer some level of flexibility in when and where employees work. But employees seek more autonomy across multiple dimensions of their work. To give employees the level of autonomy they expect today, organizations should offer radical flexibility, including with whom, on what and how much they work. When implemented well, radical flexibility is not a free for all. Instead, it is first grounded in holding employees accountable for their results and then granting them appropriate autonomy on how they achieve those results. We call this *accountable autonomy*.

- **Untapped productivity:** A huge pool of untapped productivity is hiding in plain sight in organizational work design. The 2023 Gartner Future of Work Reinvented survey found that employees who experience a human-centric work design, which combines three elements — flexible experiences, human-centric management and intentional collaboration — are 3.8 times more likely to report high productivity than those without human-centric work attributes. The 2022 Gartner Digital Worker Survey found that 71% of workers who work from a combination of locations reported higher productivity over the last 12 months, 25% higher than those who work mostly in an office or at home.

**Obstacles**

- **Productivity risk:** When providing radical flexibility, leaders find it challenging to ensure productivity while providing choice in flexible work options. The best organizations provide flexibility within team-established boundaries, focus on the activities of the role rather than the role itself, and identify and socialize manager-tested productivity solutions.

- **Collaboration:** Leaders find it challenging to set expectations and team norms around how to be productive in a flexible environment when employees' schedules, personal needs and home environments differ.

- **Assumptions about feasibility:** Regardless of role and industry, both frontline and location-agnostic workers want proportionally similar rates of flexibility. Focusing only on flexibility in where and when work happens means that some roles, especially frontline worker segments, are considered out of scope for flexibility.

**User Recommendations**

- Embrace radical flexibility as part of a human-centric work design grounded in a principle of accountable autonomy that harmonizes employees and teams desire for flexibility with the enterprises need for productivity and delivering results.

- Make all dimensions of flexibility more inclusive — even the "when" and "where" — by focusing on the activities of a role, rather than the role itself. While most organizations provide flexibility opportunities based on employees' roles, focusing on the role's activities instead can reveal hidden opportunities for flexibility in all roles, even those commonly considered ineligible.

- Improve team alignment and collaboration in a flexible environment by giving employees choices about where and when they work within team-established boundaries of how much they work.

- Scale flexible work practices by providing a virtual space for all managers of remote teams to share best practices and learn from one another.

**Sample Vendors**

Gigged.Ai; Jitjatjo; Roleshare; WorkEQ

**Gartner Recommended Reading**

How Organizations Are Taking Action to Increase Frontline Flexibility

CIOs Need to Embrace Radical Flexibility to Drive the Post-COVID-19 Work Experience

Survey Analysis: Which Hybrid Work Models Boost Productivity and Other Talent Outcomes?

What Workers Want: Top 10 Insights From the Digital Worker Experience Survey

**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

**Everyday AI**

**Analysis By:** Adam Preset

**Benefit Rating:** Transformational

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

**Maturity:** Emerging

**Definition:**

Everyday AI refers to snippets of AI services that help workers improve productivity, deliver higher-quality work and save time. Workers interact with everyday AI mostly as features of widely used personal and team productivity applications that are typically deployed across an organization horizontally. These AI services are used by employees throughout the day, and will become increasingly varied and integrated into our working lives.

**Why This Is Important**

Everyday AI technology aims to help employees deliver work with speed, comprehensiveness and confidence. Recent advances in generative AI promise to streamline content creation, analysis and collaboration. Machine learning and natural language processing capabilities are becoming more common and embedded in application features to enable automation and efficiency. Everyday AI supports a new way of working where intelligent software is acting as more of a collaborator than a tool.

**Business Impact**

Everyday AI can amplify the productivity of any worker. As digital work becomes more complex, workers are expected to master more capable yet complex applications. Everyday AI can simplify some of that complexity. Employees who wield everyday AI can focus on meaningful, high-value, creative output rather than the routine tasks that can be delegated away. Deployment of technology to meet this need is more scalable and efficient than hiring and training additional talent.

**Drivers**

Vendors in different technology markets seek to improve worker productivity in novel ways beyond simple application and feature enhancements. The development of everyday AI capabilities delivers these productivity benefits while also providing vendors with a marketable and monetizable set of new capabilities. Gartner expects to see continuing innovation from vendors as they expand their everyday AI features, with collaboration megavendors making the most aggressive investments and prominent announcements.

Several enterprise application markets have AI assist capability that aids workers in various ways. Following are examples of categories and functions that employ everyday AI:

- Business productivity: correcting errors, improving message clarity, coordinating meetings.

- Content creation: composing entire documents or designing presentations based on modest prompts.

- Workstream collaboration: notifications, canned responses, task execution.

- Meeting solutions: transcription, translation, highlighting and identifying action items, meeting scheduling.

- Search: aggregating, summarizing and citing information following natural language prompts.

- HR applications: streamlining access to organizational and employee information.

- Performance management: aggregating metrics data, providing coaching guidance.

Workers generally embrace everyday AI as it helps them save time while reducing drudgery and stress. Organizations will invest further in everyday AI as they see the technology is able to multiply their workers' output and effort. Everyday AI will become increasingly sophisticated, moving from a service that, for example, can sort and summarize chats and email messages, to services that can write a report with minimal guidance. In many ways, everyday AI is the future of workforce productivity.

### Obstacles

- Employees are unaware of everyday AI features. They distrust everyday AI, are concerned about privacy and may resist use due to poor early experiences with it.

- Some routine work processes may not be suitable for everyday AI. Enterprises may need to create foundational governance policies and practice guidance to enable the use of everyday AI. New everyday AI tools backed by generative AI demand more cloud computing resources, so sustainability and environmental impact may limit comfort with the technology.

- The benefits of successful use may be hard to capture or attribute to everyday AI capabilities. Everyday AI may require an explicit request for service, rather than being integrated into how people work where contextual disclosure can be applied.

- Vendors may overrepresent the capabilities of everyday AI. They may create and charge for product models where varying levels of everyday AI features are available at different tiers, which can make broad adoption confusing or expensive.

### User Recommendations

- Ensure that employees are aware of everyday AI capabilities in the tools they use. Find out why employees may be hesitant to use everyday AI features and methodically address objections, particularly around privacy.

- Maintain a running inventory of everyday AI features and create an everyday AI digital side hustle. Retain healthy skepticism when vendors claim to have advanced everyday AI capabilities.

- Track new everyday AI usage patterns to inform enablement strategies. Make everyday AI a top software evaluation criterion.

- Be increasingly bold in the approach to everyday AI; look for applications where the use of everyday AI can have an increasingly larger impact, such as in common activities such as creating written and visual content, data analysis and improving meetings.

**Sample Vendors**

AmplifAI; Beautiful.ai; Calendly; Google; Grammarly; Microsoft

**Gartner Recommended Reading**

Predicts 2022: Digital Workplace Is Foundational for Employee Experience

Quick Answer: How Can Everyday AI Improve Worker Digital Dexterity?

Quick Answer: How Will AI in Microsoft 365 Copilot Impact the Workplace?

**Frontline Worker EXTech**

**Analysis By:** Ranadip Chandra, Sam Grinter

**Benefit Rating:** High

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

**Maturity:** Adolescent

**Definition:**

Frontline worker EXTech is an approach that delivers distinctive employee experiences to frontline workers by unifying a collection of applications that promote staff engagement and a sense of community. Applications typically include administrative support, recognition, well-being, internal communications and personal development processes. These apps are primarily designed for use via smartphones and tablets with digital signage sometimes complementing the approach.

**Why This Is Important**

Organizations in verticals like retail, healthcare, manufacturing and logistics have many more frontline workers than desk-based workers. Globally, Gartner estimates that there are 2.8 billion frontline workers — more than twice the number of desk-based workers. Despite this, technology initiatives have often focused solely on desk-based workers. Delivering technology focused on addressing this unmet need is a significant opportunity for improving the experience of this underserved section.

**Business Impact**

- Frontline jobs come under extreme stress and burnout. Positive experience in day-to-day business applications would remove stress and improve retention.

- Quick access to training or standard operating procedures for broken equipment is very beneficial for logistics and manufacturing industries.

- Frontline worker EXTech represents an opportunity to aggregate 10+ different applications these workers engage with daily and replace clunky homegrown portals.

**Drivers**

A common driver of investment in frontline worker EXTech has been the mismatched job openings and hire rates. According to the U.S. Department of Labor — Bureau of Labor Statistics April 2023 report, the number of job openings stands at 9.9 million, but the number of hires stands at 6.2 million, indicating retention is a key driver for organizational sustainability.

Drivers in individual application categories used by frontline workers are:

- Workforce management core administration: Significant changes in work for many frontline roles. This trend increases the importance of dynamic task management to frontline workers.

- Benefits and recognition platforms: These applications enable frontline workers to receive rewards that are easily redeemable while someone is on the road and facilitate immediate acknowledgments of co-workers across teams without complex workflows.

- Well-being/experience for frontline workers: These applications track health through wearables or offer stress reduction for employees dealing with a high volume of customers directly.

- Employee communication applications (ECA): Include internal communication channels for organizational communications and are often better designed to meet the needs of frontline workers than mainstream consumer-based communication platforms. These channels also integrate with schedules and include the ability to create communities with common interests or work.

- Learning platforms for frontline workers: Retail and hospitality frontline workers are increasingly leveraging dedicated frontline worker learning solutions to read job-specific learning bytes.

- Superapps: Some organizations are piloting with front-end platforms for employees that consolidate multiple application services such as payment and help desk allowing for new miniapps to be built in a composable way. These apps provide both the work and life needs of frontline workers by allowing them to pick and choose which miniapps they use when they need them.

**Obstacles**

- Similar to workforce management technology, frontline worker experience initiative suffers from a lack of ownership at the vertical or horizontal executive levels. Some initial projects led by application leaders are maturing from the early adoption stage, but most are stand-alone deployments led by the head of the department or line of business.

- In some industries, for safety reasons, frontline workers are prohibited from using mobile applications for the entire length of the shift.

- The solutions need to prove the nontracking of time and data during off-shift hours to build greater trust.

- The discipline of providing compelling frontline worker experience needs a combination of many different applications from different markets and/or often vertical-specific products, making it difficult to navigate the market or recommend best practices for deploying and managing the portfolio.

- Many industry-specific applications prove to be important for the frontline worker in the short term, but adoption and usage decrease over time due to a lack of improvements.

**User Recommendations**

- Evaluate solutions based on their ability to work uninterruptedly for hours in the background and provide significant value in little interaction time. Many frontline workers would only access the application between time-consuming tasks.

- Set a criterion that any solution that "needs more than two minutes to complete a moderate complexity use case" or "takes more than five clicks/form parameters" should not be considered.

- Analyze the employee engagement metrics filtered to identify the specific figure for frontline workers. Establish frontline worker engagement as a key metric for the success of the employee experience strategy of the organization.

- Balance the content of frontline EXTech applications between critical tasks and communications with well-being and DEI announcements.

- Explore how frontline worker EXTech can coexist with applications that meet more stringent needs, such as clinical collaboration or purpose-built tools for certain operational work.

**Sample Vendors**

Blink; DaysToHappy; Flip; Headspace; Perkbox; Site Diary; SparkPlug; Workstream; Wyzetalk; YOOBIC

**Gartner Recommended Reading**

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

How Organizations Are Taking Action to Increase Frontline Flexibility

Presentation Materials: The Future of Frontline Work

**Connected Factory Worker**

**Analysis By:** Simon Jacobson

**Benefit Rating:** Transformational

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

**Maturity:** Adolescent

**Definition:**

Connected factory workers leverage digital tools and data management techniques to improve and integrate their interactions with both physical and virtual surroundings. This improves decision accuracy, proliferates knowledge and reduces variability — improving engagement, satisfaction and retention.

**Why This Is Important**

Digitization in factories is intensifying while operational know-how fades. Factory workers struggle to embed new technologies into their daily work, negatively impacting the broadening of core skills and building digital fluency eases labor constraints. Manufacturers are investing in their factory workforces. The solution is as much a technology construct that changes how factory workers access information and knowledge to work differently as it's a change management exercise in workforce development, behavioral shifts and integrated continuous improvement.

**Business Impact**

Frontline workers are indispensable and the convergence of technology innovation and investment in their experience is critical for improving engagement, satisfaction, and retention:

- Increasing operational excellence, flexibility and quality of outputs by continuous learning but also context specific operations to limit deviations from standard procedures.

- Ensuring safe but challenging working conditions to improve work motivation and retention and to open up prospects for career development.

- Extension of standard work procedures for more efficient use of resources, but also appropriate social behavior in communication with colleagues and supervisors.

- Greater, intangible returns appear when initiatives are part of a formal workforce development strategy.

### Drivers

- Labor availability and up-to-date skills are constraints. Meanwhile, smart manufacturing is a net job creator and demand for capable frontline workers is soaring. Organizations seek a factory workforce that can seamlessly operate between the virtual and physical worlds.

- Generational gaps in factories can impact technology acceptance. New workers are tech-savvy but lack access to best practices and know-how. Tenured workers have detailed process knowledge and digital savvy as consumers — the tools supporting them on the job have to evolve.

- The nature of work in factories is being (re)designed, digitized and improved, impacting total productivity and peer-to-peer communication — not to mention job families and role profiles.

- Growth in vendor solutions to provide frontline workers the right information available contextualized at the moment of need.

### Obstacles

- Accepting operational excellence as "good enough" ROI when the impact and benefits are often intangible.

- Curating relevant datasets across existing technologies, manual and undocumented knowledge, and informal know-how from tenured workers. In parallel, the risk of information overload when moving away from manual tasks could be burdensome versus aiding.

- Involving workers in the solution design and implementation process helps set demand and adoption.

- Learning and development evolution, from classroom and episodic to experiential and continual, is nascent.

- Patience with AI: Although attractive for decision support, curating the knowledge that provides guidance, ensuring IP is protected, and an ethical stance are all critical. Mishaps can impact recommendations, pay or career advancement and lessen trust.

- Underinvesting in governance: Providing workers with tools to build their own experiences or redefine standard work eliminates time and effort. Yet, shadow IT and anarchy arise without dedicated operational excellence/continuous improvement teams to manage common requirements and risks.

**User Recommendations**

- Strike a balance between digital enablement and cultivating future competencies by framing your initiative as part of a broader manufacturing workforce development program.

- Consider architecture over applications. This will limit point solutions and the complexity of managing multiple vendors. This includes a focus on pulling in data from other transactional systems such as MES as means to link production data with employee-led improvement opportunities.

- Invest in upgrading learning and development (L&D) programs to ensure that skills development matches technology capabilities.

- Make your focus the creation of a "data-driven" culture in manufacturing operations by diligently avoiding a scenario where employee creativity and ingenuity is stifled.

- Prepare to balance governance and flexibility during implementation by having clarity on where enterprise standards must give way to local ways of working.

**Sample Vendors**

4Industry; Covalent Networks; L2L; Microsoft; Operations1; Poka; QAD Redzone; SAI Global; SwipeGuide; Zaptic

**Gartner Recommended Reading**

Innovation Insight for the Connected Factory Worker

How to Take a Life Cycle Approach to Developing the Connected Factory Worker

Future of Work Trends: 5 Trends Shaping the Future of Frontline Workers

Supply Chain Executive Report: Developing the Supply Chain Professional of 2025

Sliding into the Trough

## Autonomous Things in Manufacturing

**Analysis By:** Jonathan Davenport

**Benefit Rating:** High

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

**Maturity:** Adolescent

### Definition:

Autonomous things in manufacturing like mobile robots, drones or industrial equipment can operate in the real world without human interaction. They can work across many environments, with varying levels of capability, coordination and intelligence. The devices use AI to augment or automate tasks and processes, and are one of the three foundational building blocks for smart factories.

### Why This Is Important

Autonomous things are foundational to smart factories. They can assist or redeploy human workers, enabling cost optimization with improved production cycle times and product quality. This creates high, and occasionally transformational, business benefits. While there are successful use cases of "cobots" working alongside humans, the more sophisticated applications that autonomous things can handle changes the nature of human-machine collaboration, impacting operational decisions.

### Business Impact

Technology advancements are spurring demand for speed and throughput without any disruption to factory overhead and ongoing costs. This is attractive, but requires sizable investments in factory IT and operational technology (OT) infrastructure and change management initiatives. It also requires the adoption of Internet of Things (IoT) combined with the maturation of AI to drive adoption and deliver sustained value. More-intelligent environments translate to machines and humans working together in a precise, safe and collaborative fashion.

### Drivers

Discussions on automation at functional and corporate levels are increasing:

- There is growing interest in exploring how to enhance different combinations of physical and virtual objects, and manipulate different factory environments with various levels of human guidance, autonomy and collaboration.

- Evolving capabilities of various individual technologies (e.g., IoT, AI, edge computing and 5G).

- Formal smart factory strategies that support various styles of automation (that is, lights-out processes).

- Aging economies combined with a lack of appropriate talent and skills leading to labor shortages in many industrialized nations, especially in Europe and Japan. These labor availability risks are driving interest in automation or remote management of site activities.

- Internal business requirements combined with competitive pressures drive a need for higher levels of repetitive quality, responsiveness, efficiency and sustainability objectives.

- Autonomous thing implementations' ability to reduce cost or reliance on legacy systems and to improve human working conditions and safety, while delivering improved productivity and speed.

- Macro environmental factors like supply chain constraints, labor shortages and inflation make productivity improvements of both human workers and machines, and the support of remote and flexible working even more important. In turn, this also helps diversify factory workers and broaden their skill set so that they can move to supervisory tasks beyond siloed tasks and contribute to continuous process improvement.

- Emergence of automated things orchestration platforms which act as an intelligent middleware that integrates and orchestrates work between various business applications, heterogenous fleets of operational robots and other automated agents like doors or elevators. This middleware layer helps reduce integration costs to enterprise IT systems such as ERP or warehouse management system.

- Autonomous things can often be utilized based on a service-based subscription, cutting down on barriers to adoption. The operational expenditure links costs directly to the benefits that autonomous things deliver.

**Obstacles**

■ This technology is not solely a physical form factor. Autonomous things cannot match the human brain's breadth of intelligence and dynamic general-purpose learning, meaning they are not well suited to nonrepetitive tasks. Essentially, the more complex a task is (e.g., complex assembly) the more costly it is to replace a human worker.

■ Demand outstrips supply for new skills requirements altogether in manufacturing. The wide talent pool needed to meet the complex programming, analytical, technical and engineering skills (OT) is lacking.

■ The costs and complexities of managing growing data volumes, assessing use cases and processes, and testing and learning about different technologies might put autonomous things out of direct reach for now.

■ In countries with low labor cost and high labor availability, the business case turns out in favor of the people and not the machines.

**User Recommendations**

■ Avoid the perception of job elimination, at a time when factory staffing levels are in flux, by introducing autonomous things with acute clarity and clear communication.

■ Manage the accelerated pace of behavioral change between humans and machines by reshaping continuous improvement and operating systems to incorporate standard work, new metrics and defined decision rights.

■ Evaluate autonomous things as both substitutes for and complementary to your existing workforce and automation layouts. Map methods and procedures with the right concepts for autonomous things by understanding labor versus automation trade-offs.

**Gartner Recommended Reading**

Lessons From Mining: 4 Autonomous Thing Benefit Zones for Manufacturers

Autonomous Things Deployment: 5 Best-Practice Stages That Require Manufacturing CIO Leadership

Top Strategic Technology Trends in Asset-Intensive Manufacturing for 2023

Quick Answer: Manufacturing CIOs Are Using Intralogistics Smart Robots to Proliferate Smart Factories

## Immersive Experience

**Analysis By:** Christian Titze

**Benefit Rating:** Moderate

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

**Maturity:** Adolescent

### Definition:

Immersive experience reimagines the user experience by enabling users to perceive the virtual world using virtual, augmented and mixed reality. It enables users to interact with the virtual world by not only using conversational systems, chatbots and virtual assistants, but by leveraging hardware and software tools that give them the perception of being present in a digital environment or integrate digital content into a real-world physical experience.

### Why This Is Important

Interactions are becoming more mobile, virtual and distributed as the user experience undergoes a shift in perception and transitions to a rich, multidimensional and personalized experience. The evolution of continuous, immersive and conversational user experiences will have a profound impact on supply chains' ability to reimagine, improve and enhance the user experience.

### Business Impact

Immersive experience technologies have the potential to radically influence the trajectory of the technology supporting supply chain processes. It presents new interaction models through the product life cycle, not only with humans, but with other processes, machines and applications, such as in manufacturing, quality, customer relationship and warehouse management. The new interaction models will augment human capabilities and the nature of standard work.

### Drivers

- Immersive on-the-job training can be provided for onboarding new workers in a safe, realistic, virtual environment (e.g., for manufacturing, maintenance, warehouse operations or services). Critical step-by-step instructions can also be given to remote workers through an immersive experience.

- The use of augmented reality headsets in warehousing has garnered interest, and deployments indicate some improvements in worker efficiency versus using existing methods. However, uptake is very slow.

- In transportation, there is the potential for solutions targeted at productivity, such as augmented reality, that support a driver's journey, navigation and safety. Wearable solutions could, for example, monitor driver fatigue.

- In supplier management, remote supplier audits can be enabled with immersive experience technologies, maintaining supplier quality when travel is not possible or desirable.

### Obstacles

- Cost, complexity, integration and scaling challenges remain the biggest obstacles to wider adoption of immersive-experience technologies.

- An unclear value proposition makes building a business case hard, which is slowing adoption.

- The degree of maturity of advanced technologies is a barrier to wider immersive experience adoption, but the technologies will become more stable and mature over time.

- The lack of good user experience (UX) design is another barrier (after technology sophistication) to the wider adoption of immersive technologies.

- Development costs or production volumes must be overcome before mass market adoption can be achieved.

**User Recommendations**

- Strive to create effortless experiences for users by driving an experience-driven agenda for technology investments. Hereby connect and improve digital initiatives that drive user confidence, satisfaction, loyalty and advocacy.

- Start by identifying specific use cases, such as field service, logistics, warehousing, manufacturing, maintenance or design, that can benefit from immersive experience technologies.

- Prioritize the value of immersive experiences and newly emerging applications to provide safer, secure and more transparent working, training, onboarding and processing environments.

- Set the business goals, requirements and measurements for your implementation before choosing a provider or solution. Rich and robust offerings can bring value, but only with a clear intention.

- Identify critical gaps in customer and user interactions, such as a remote workforce being exposed by the pandemic. Determine new targeted business outcomes to address using immersive experience capabilities.

**Gartner Recommended Reading**

[Maverick* Research: Augmented Reality — Stuck Between Virtual and Physical Worlds, and Stressed Out](#)

[Emerging Tech: Top Use Cases of the Metaverse](#)

[Top Trends in Strategic Supply Chain Technology 2023](#)

[Quick Answer: How Do I Get Started With Total Experience?](#)

**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

**Hybrid Work**

**Analysis By:** Caitlin Duffy, Tori Paulman, Hanne Nieberg, Dana Stiffler

**Benefit Rating:** Transformational

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

**Maturity:** Adolescent

**Definition:**

Hybrid work describes a working model where employees are expected to attend the office at least one day per week while being permitted to work from a location other than the office some of the time. Hybrid work models vary, i.e., offering employees the individual choice or orchestration or schedule of days in the office. Hybrid work can sometimes refer to space, as in "hybrid workplace," which describes an office that is able to support interactions that include in-person and remote employees.

**Why This Is Important**

When hybrid work is designed intentionally and inclusive of individual and team preferences rather than as one-size-fits-all, it is positively correlated with better business performance and talent outcomes. Employers that allow greater flexibility over where and when employees work enjoy a career brand premium over employers that don't, achieving better attraction and retention outcomes. Today, 96% of HR leaders say that they already have or will implement hybrid work.

**Business Impact**

Flexible hybrid, defined as a mix of on-site and remote but "offered the flexibility to choose where I work from," results in a:

- 1.6x greater likelihood of high intent to stay,

- 1.3 greater likelihood of high performance, and

- 1.8x greater likelihood of low fatigue.

According to Gartner's 2022 Digital Worker Survey, 71% currently working in a combination of locations were more productive over the last 12 months, versus 42% who worked mostly at home and 47% who worked mostly in the office.

### Drivers

- The current hyper-competition for talent grants employees more bargaining power. The ability to work hybrid or remotely factors into their decisions to stay at their current jobs or look for new opportunities.

- Location is the No. 2 EVP driver of attraction across all industries (after compensation).

- Fifty-two percent of employees said the ability to work flexibly would affect whether they decided to stay at their organizations.

- Significant numbers of employees said they were willing to quit their jobs over a variety of hybrid work-related issues, such as being required to work on-site or having to take a pay cut to work remotely.

- The focus on hybrid work by both proponents and detractors has resulted in many organizations' strategies pushing slightly past the Peak of Inflated Expectations to a place where they feel the consequences of no or poor hybrid work design — disengagement, burnout, attrition, and lack of compliance.

**Obstacles**

- Many leaders still feel nostalgia for opportunistic interactions such as those that occur at a water cooler and equate physical presence with effectiveness, and this presents major obstacles to acceptance of hybrid work.

- Organizations risk the failure of their senior leaders, managers and work structures to keep pace with employees' changing expectations for flexibility.

- Many organizations took steps to get "back to normal" in the second half of 2022 and early 2023, reopening offices and encouraging — or even requiring — employees to work on-site some or all of the time. An extreme version of this, a so-called "hard return" to the office full-time, puts up to 39% of your workforce at risk of attrition.

- Most organizations lack applications that will help employees and managers plan the best day to visit, navigate workplaces to find services and amenities, and find colleagues outside of inviting folks to meetings in the office.

**User Recommendations**

- Shift from a location-centric to a human-centric work design — flexible experiences, intentional collaboration, and empathy-based management — to drive performance by resetting expectations around how, where and when we work.

- Shape work initiatives in six areas through experimentation, learning and iterating to position the organization for digital era success. These six areas are human-centric work design, rethinking the workplace, reshaping the culture, managing in a hybrid world, digital enablement, and shifting talent and skills.

- Invest in workplace experience applications to support the planning and orchestration of hybrid work and deliver a hospitality-like experience in the office (see Market Guide for Workplace Experience Applications).

- Shed industrial-era beliefs about work that constrain digital-era success by listening for outdated assumptions from your peers as well as yourself, then countering them with new data-driven insights and work design thinking.

**Gartner Recommended Reading**

CHRO Resource Guide for Hybrid Work Design

Redesigning Work for the Hybrid World: Opportunities for Knowledge Workers

Hybrid Work Data Overview 4Q22

Case Study: Reset Hybrid Collaboration Habits (Dropbox)

3 Ways to Help Managers Overcome Hybrid Team Challenges

**Next-Gen Talent Assessments**

**Analysis By:** Rania Stewart

**Benefit Rating:** Moderate

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

**Maturity:** Adolescent

### Definition:

Next-gen talent assessment tools use advanced analysis techniques to supply insights that inform decisions about the suitability of individual workers for both current jobs and potential future roles. They can also assess a worker's cultural fit to a team by comparing their assessment results to those of existing members. The market for these solutions is broad, and enterprises will often use different assessments across their span of roles.

### Why This Is Important

Talent acquisition (TA) teams are shifting from looking for the best talent to seeking the right talent. In addition to traditional skills-based assessments, which screen out candidates based on a narrow set of skills/credentials, organizations use talent-focused assessments to "screen in" external and internal candidates with the potential to succeed. Solution importance is growing, as persistent talent shortages require companies to think differently about what a high-quality candidate might look like.

### Business Impact

Next-gen talent assessments improve worker effectiveness by more accurately identifying best-fit external and internal candidates for critical roles. They can reduce costs and improve productivity, since best-fit candidates generally have a longer tenure, both in their initial jobs and in the long term within the enterprise. These assessments reduce offboarding and replacement costs, decrease new hire training costs and speed candidates' time to productivity.

**Drivers**

■ Extensive data collection and analysis allows organizations to establish cognitive and behavioral models to better predict performance in a given role or organization. Organizations usually have each individual complete a set of tasks, then compare the results to an aggregate profile of top performers in a manner purportedly free from linguistic or cultural bias.

■ AI (including deep learning, NLP and pattern analysis across large datasets) can predict fit or skills level. Organizations can use AI-driven assessments to improve predictive accuracy by "learning" over time without explicit programming, based on an ever-growing dataset and usage analysis.

■ Gamified user experiences turn tasks into "games" or simulate real-life job situations. Configuration via adaptive digital art and advanced software logic can accommodate different product brands and job roles within an organization.

■ Job application volume is down compared to prepandemic levels, but the pace of skills evolution, baby-boomer retirements, low immigration and other factors means there aren't enough skills to go around. Compounded by workers looking for different things in jobs, the net result is a wider variety of backgrounds, experiences and skills to screen for job fit.

■ Employers need new hires to reach productivity faster than ever. Task-based assessments or real-world scenarios are perceived as better predictors of performance.

■ Diversity, equity and inclusion initiatives necessitate career development and talent reskilling.

## Obstacles

- Next-gen talent assessments show promise, but the fact base of verifiable outcomes is limited, and many are a better fit for high volume and/or early career recruitment use cases where indicators of success or high performance are fairly established and clear.

- Providers vary widely in how they combine the tools and technologies driving this trend, and there is a lack of market agreement on which approaches work best for a given use case.

- Various regulatory agencies have expressed an interest in monitoring how enterprises use these tools, so more legislation is likely. Mitigating bias is an ongoing concern when AI-enabled machine learning is involved.

## User Recommendations

- Determine what information an assessment will provide that you don't already have. Be strategic and clear how it fits into indicators you've made a successful hire.

- Evaluate the techniques used to predict fit, and ask for proof of improved accuracy over time. Ask vendors if their offerings integrate to any skills ontologies. Check customer references to verify real-world results.

- Examine integration with recruiting solutions and how results populate the talent profile of your core human capital management or TA suite.

- Partner with a vendor to build a dataset that identifies "top" performance for the affected jobs/roles to reduce bias and validity concerns.

- Determine your organization's willingness to "opt in" to sharing aggregate job and/or performance data to enable benchmarking by segment.

- Evaluate contractual terms and conditions to ensure local standards for privacy and ethical data use are maintained.

- Assess your readiness to extend assessments beyond recruiting to posthire talent management.

## Sample Vendors

Arctic Shores; Harver; HireVue (Modern Hire); Logi-Serve; Outmatch; Plum; Sapia; Sciolytix; SHL; Tazio

**Gartner Recommended Reading**

Infographic: Artificial Intelligence Use-Case Prism for HCM Technology

Future of Work Reinvented: Shifting Talent and Skills

2023 Recruiting Innovations Bullseye Report

Ignition Guide to Selecting Candidate Assessments

Why You Must Redefine Quality of Hire (and How)

**Next-Gen WFM**

**Analysis By:** Sam Grinter, Ron Hanscome, Ranadip Chandra, Kelsie Marian

**Benefit Rating:** High

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

**Maturity:** Early mainstream

**Definition:**

Workforce management (WFM) is a set of functions designed to help manage hourly paid workers. Core WFM functions include time and attendance, scheduling, absence and task management. An emerging and transformation capability is AI-enabled skills management in WFM. Next-gen WFM is the result of the following trends impacting the market: skills management, automation of the manager experience, employee experience, generative AI, new platforms and the flexible workforce.

**Why This Is Important**

WFM is often considered as only a system of administration. However, WFM contains untapped value in supporting the business outcomes of worker effectiveness, the employee value proposition and cost optimization. Furthermore, leaders find it challenging that WFM has no clear business owner, leading to WFM applications being overlooked and underinvested. As such, WFM, and in particular next-gen WFM, presents a compelling opportunity to deliver business transformation.

**Business Impact**

Next-gen WFM can augment and transform hourly/frontline worker business processes. The benefits of next-gen WFM include more effective resource scheduling, improved employee experience, reduced manager time spend on administrative tasks, reduced training cost and easier management of employees and contingent workers.

**Drivers**

- WFM is included as part of a wider digitalization/digital workplace/employee experience initiative.

- The ransomware attack and subsequent outage of the Kronos Private Cloud (KPC) product in December 2021, which affected 2,000 enterprise clients, is leading to a refresh of this product and similar era products.

- WFM is included as part of wider human capital management/payroll transformation.

- WFM is adapted to be fit for purpose in the context of skills shortages and the COVID-19 pandemic.

**Obstacles**

- A lack of clear ownership often stalls investment, with ownership often somewhere between HR, IT, operations and even finance.

- Consideration of WFM as a system of administration rather than a system for transformation is a continued obstacle for further growth.

- The market for WFM is highly fragmented, making it challenging to consolidate WFM applications with the wider HR application ecosystem.

**User Recommendations**

- Unlock new business value by evaluating the current use of qualification and certification as a capability of WFM and expanding to include other skills attributes relevant to each role.

- Work with operations, finance, procurement and HR leaders to ensure your organization's WFM requirements reflect an updated and holistic perspective that incorporates the needs of workers, managers, administrative staff and executives.

- Plan to migrate any on-premises and older cloud WFM applications to the latest generation of cloud solutions within the next one to two years to gain access to the latest capabilities and, where applicable, leverage migration discounts.

- Assign a stakeholder for WFM applications to prioritize and oversee investment.

- Identify the potential of these emerging WFM capabilities. Develop a business case for a pilot deployment to quantify the ROI and to justify wider rollout of the initiative.

**Sample Vendors**

ADP; ATOSS; Ceridian; Deputy; Jitjatjo; Legion; Mark Information; Quinyx; UKG; WorkForce Software

**Gartner Recommended Reading**

Innovation Insight for AI-Enabled Skills Management in Workforce Management

Market Guide for Workforce Management Applications

Best Practices for Workforce Management Deployments

Quick Answer: What Are the Lessons to be Learned From the UKG Ransomware Attack?

Drive Employee Experience for Frontline Workers Using HR Technology

**Virtual Reality**

**Analysis By:** Tuong Nguyen

**Benefit Rating:** Moderate

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

**Maturity:** Adolescent

**Definition:**

Virtual reality (VR) provides a computer-generated 3D environment that supports both computer graphics and 360-degree videos. This environment surrounds a user and responds to an individual's actions in a natural way, either through immersive head-mounted displays (HMDs), computing devices or room-based systems.

**Why This Is Important**

VR is a fully digital experience or interface that can complement current tools and practices, transporting users into an immersive and fully digital 3D experience. Organizations can use VR simulations to change how they interact with employees, partners and customers by allowing them to mimic tasks and interactions. This is especially helpful whenever presence, embodiment, and empathy via remote 3D visualizations add value.

**Business Impact**

Virtual-reality 3D simulations can:

- Reduce training costs.

- Reduce equipment downtime by providing training to employees.

- Reduce employee risk by providing task simulations.

- Improve design cycle times.

- Provide innovative ways for employee engagement, soft skills training and collaboration.

- Deliver new experiences and ways of interaction for customers, such as tours or planning and designing capabilities.

**Drivers**

- As an interface for digital content, VR has gained significant traction from the hype around the metaverse. This is primarily because technology giants such as Meta have been focusing on the VR aspect of metaverses.

- The consumer interest in VR has had a spillover effect upon enterprises.

- Enterprise interest has also increased because COVID-19-related restrictions prompted organizations to actively seek alternative solutions for customer engagement, remote training and collaboration. While some offices have reopened, the increased prevalence of remote and hybrid working has sustained significant interest.

- There is a growing body of use cases that create value, for example in the fields of architecture, engineering and design. Further, 360-degree image or video tours can add value in real estate and documentation. Other use cases are training simulations in high-risk situations, for example, in expensive or inaccessible locations (such as space or deep sea exploration, surgical training). Finally, onboarding for dangerous or remote locations (such as an oil rig) and soft skills training are also growing VR use cases.

**Obstacles**

- The VR solution provider ecosystem has been slow to advance products.

- The breadth and quality of VR content remain limited.

- The existing solutions lack scalability.

- There is a lack of enterprise-ready solutions.

- Potential customization requirements and limited scalability make VR experiences much more expensive than augmented reality (AR) ones — outweighing potential benefits in many situations.

- Safety and comfort issues such as headaches and nausea present significant adoption hurdles, especially with HMD-based VR solutions.

- VR HMDs are purpose-built for different professions or use cases. Therefore, they lack standardized features and controls.

**User Recommendations**

- Use VR to support your organization's training, visualization and collaboration tasks that require 3D content. These tasks include building information modeling (BIM) and computer-aided design (CAD).

- Identify procedures and experiences that may benefit from virtualized visual interactions, such as tours and training procedures.

- Discover potential benefits of VR by benchmarking traditional practices against VR experiences.

- Focus on a small number of pilots based on platforms that are designed to meet enterprise requirements.

- Avoid point solutions. Instead, look for solutions that have a broader applicability and can be integrated into existing solutions and processes.

**Sample Vendors**

Arthur Digital; FundamentalVR; Immerse.io; Matterport; MetaVRse; Motive.io; Remio; SimInsights; Strivr

**Gartner Recommended Reading**

Augmented Reality and Virtual Reality Will Transform Selling

Virtual Reality and Augmented Reality for Remote Workers

Quick Answer: What Emerging Metaverse Capabilities Should Be Prioritized for More Effective Meetings?

Emerging Tech: Metaverse Providers Must Refine Their Go-to-Market Strategy and Use Cases to Succeed in the Emerging Metaverse

**Augmented Reality**

**Analysis By:** Tuong Nguyen

**Benefit Rating:** High

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

**Maturity:** Adolescent

**Definition:**

Augmented reality (AR) is the real-time use of information in the form of text, graphics, audio and other virtual enhancements integrated with real-world objects and presented using a mobile, head-mounted display (HMD) or projected graphics overlays. It is this "real world" element that differentiates AR from virtual reality. AR aims to enhance users' interaction with the environment, rather than separating them from it.

**Why This Is Important**

AR is the next era of experience or interface that enhances the user's surroundings with real-time, relevant, interesting and actionable information. Frontline workers in asset intensive industries (such as mining, engineering, construction, energy and utilities, logistics, manufacturing, healthcare) are currently showing the most benefit from this type of experience. Particularly using digital overlays that help employees do their job more efficiently, effectively and more safely.

**Business Impact**

Current technology is best suited for purpose-built and specialized solutions. As such, position and adoption speed for AR will vary greatly with vertical and industry; however, the benefits of AR include cost reduction and task efficiency and effectiveness. Current horizontal tasks seeing the most traction are procedural tasks, and situational video with telestration. Visual design and customer engagement are also seeing traction, but to a lesser extent due to technology and market limitations.

**Drivers**

■    Growing interest in asset-intensive enterprises to improve employee safety, efficiency and effectiveness using AR for training and workflow improvement.

- AR software tools providing better integration and with more systems of record — enabling enterprise seamless interaction with existing systems (instead of managing individual applications).

- Evolving partnerships (improved ecosystem) of AR software and hardware; which are evolving into enterprise-ready and off-the-shelf solutions.

### Obstacles

- Turnkey solutions not available/viable, yet.

- Lack of appropriate digital content. AR is inherently digital, therefore, benefits organizations that are further along in their digitization journey.

- Limited accessibility: Current solutions are better described as AR-inspired solutions because these experiences contain elements of AR and offer limited, purpose-built capabilities; encapsulated within a stand-alone app, or for a specific task.

- Usability: New interface paradigms need to be created to handle interactions between physical and digital elements in 3D space. A mix of vocabularies of different interface modalities (speech, motion, touch, gesture and so forth) need to be defined and standardized to make AR interactions intuitive.

- Availability of form factors that make AR experiences seamless and valuable needs improvement. For example, handheld devices deliver a poor user experience for regular and extended AR usage; while the market for HMDs have few, purpose-built options.

### User Recommendations

- Select/clearly define your use cases. Set benchmarks against unaugmented solutions to understand risks and benefits and determine ROI.

- Set the business goals, requirements and measurements for your AR implementation before choosing a provider.

- Plan deployments around AR based on handheld devices (phones/tablets). HMDs have higher business value for all-day hands-busy tasks.

- Determine a clear intention for your deployment to ensure value. For enterprise, use AR as a tool to enhance employee job function for frontline workforce. This could include, delivering context-specific information when needed for field workers, better leveraging experts (using one-to-many video support) in plant and maintenance operations, or enhancing business processes via AR-based training and instruction.

**Sample Vendors**

Augmentir; CGS; IrisCX; Librestream; OverIT; PTC; Scope AR; Taqtile; TeamViewer; Xerox

**Gartner Recommended Reading**

The Virtuous Circle of Collaboration With Augmented Reality in Field Service

Emerging Technologies: Tech Innovators in Augmented Reality — Augmentation and Spatial Interaction Layer

Emerging Technologies: Tech Innovators in Augmented Reality — AR Cloud

Emerging Technologies: Kick-Start Adoption With Essential Enterprise Augmented Reality Business Practices

Innovation Insight for Immersive Technologies in Frontline Working

**External Workforce Procurement**

**Analysis By:** Kaitlynn Sommers

**Benefit Rating:** Moderate

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

**Maturity:** Early mainstream

**Definition:**

External workforce procurement solutions support the sourcing, automation and governance of contingent worker hiring and services-procurement based on statement of work (SOW). Core functionalities include requisition and SOW life cycle management, CV/resume comparison, rate comparison and negotiation, rate cards or service catalogs, onboarding/offboarding, task tracking, supplier "self-receipt," and burn-rate tracking.

**Why This Is Important**

External workforce procurement solutions enable enterprise leaders to gain access to a skilled external workforce, automate hiring, improve compliance, optimize sourcing, and mitigate risks of contingent workforce (CW) and SOW-based services projects. These solutions are becoming increasingly important to ensure business continuity despite disruptions due to the COVID-19 pandemic, shortages of skilled workforce, economic uncertainty and increasing acceptance of remote working.

**Business Impact**

External workforce procurement solutions provide:

- Improved rate comparison, task tracking and cost reporting

- Better visibility of labor rates, time and materials charges, and milestone payments

- Simplifying onboarding and offboarding workflows

- Tighter spending controls to eliminate duplicate charges and overpayments

- Ability to leverage multiple talent channels, including staffing suppliers, and public and private talent pools

- Identification and mitigation of potential risks for SOW-based projects

**Drivers**

- Times of economic uncertainty increases the utilization of external workforce solutions as use of contingent resources increases workforce flexibility.

- Higher compliance, optimization of sourcing and automation of SOW life cycle management are the key growth drivers for the nascent SOW-based services market.

- Talent shortages put pressure on organizations to look beyond hiring for full-time roles to fill open positions and skill gaps with contingent workers.

- Reducing the cost of managing contingent workforce while improving the process efficiency and experience of business users is a priority for organizations, enabled by adopting external workforce procurement solutions. Manual management of these programs is slow and cumbersome.

- The solution options for managing external workforce procurement are expanding. While vendor management system (VMS) vendors support the most comprehensive functionality, procure-to-pay (P2P) suite vendors, HR applications vendors and freelancer management solution vendors are also adding functionality. As vendors begin to offer extended capabilities to increase the business impact, the adoption of external workforce management solutions will increase.

- Leading emerging technology themes, such as AI and automation, advanced analytics, and direct sourcing, will improve the efficiency and adoption of external workforce management solutions.

### Obstacles

- Many organizations outsource the managed services related to contingent labor programs. In many cases, the managed service provider (MSP) may provide technology or proprietary processes for managing the program, which limits the adoption of stand-alone technology.

- Contingent labor and services spend varies for many organizations. Those with limited services spend are less likely to prioritize an investment in external workforce management solutions over alternative sourcing and procurement solutions that address higher volume spend categories.

- Traditional supplier-funded models are aging as the market slowly makes a shift from transactional pricing to subscription-based pricing. This can make it more challenging to sell the business case for a technology investment.

- Limited capabilities of current services management software applications do not fulfill the expectations of sourcing leaders. Vendors tend to focus on basic use cases, thereby reducing the business impact of such applications.

### User Recommendations

- Evaluate the benefits of external workforce management solutions by analyzing your spend data and determining the size of your service program spend. Gartner typically recommends that organizations with $25 million in contingent labor and/or services spend generally have a solid business case for investing in a solution.

- Assess your existing application portfolio to determine whether you can extend the capabilities of an existing vendor to manage your external workforce. Carefully review the capabilities to ensure they fully meet the necessary requirements.

- Ensure that the fee structures are fair and reasonable for the buying organization and its suppliers as some solution vendors require suppliers to pay fees.

### Sample Vendors

Beeline; Coupa Software; Magnit; SAP; Simplify Workforce; VectorVMS; Workday (VNDLY)

### Gartner Recommended Reading

Magic Quadrant for Procure-to-Pay Suites

Critical Capabilities for Procure-to-Pay Suites

**Digital Credentials**

**Analysis By:** Robert Yanckello, Kelly Calhoun Williams

**Benefit Rating:** Transformational

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

**Maturity:** Mature mainstream

**Definition:**

Digital credentials are the digitalization of traditional diplomas, alternative microcredentials, professional licensure, certifications, badges and informal credentials. They indicate an individual's knowledge, specialized skills or qualifications via a secure framework to digitally capture and visually present achievements that are verifiable and portable.

**Why This Is Important**

Credentials issued by education institutions, organizations or employers are the only tangible evidence of education or skills achievement, and can be seen as "education currency." New forms of credentials are increasing the speed and granularity of credential exchange. Digital credentials will:

- Enable decoupling of some K-12 and higher education business models.

- Transform some education outcomes.

- Speed up time to market for job seekers and establish a new ecosystem of learning.

**Business Impact**

Digital credentials enable a secure, validated and expedient exchange of skills and education, and can impact student outcomes for employment, lifelong learning and career advancement. The learner will be empowered to own the credential and share when they choose. The impact of digital credentials on K-12, corporate workforce development and higher education will transform business models for learning, talent identification and fluidity, while enabling new entrants into the education ecosystem.

**Drivers**

- The growing demand to address workforce needs and employability globally is driving the credential landscape to be more dynamic and responsive and is challenging the essence of traditional higher education.

- As the acceleration of digital business continues at an unprecedented pace, the delivery of all credentials in digital format is a natural progression.

- Changing business models, the increasing number of learners entering the workforce, and the length of time from graduation to employment, are influencing students and employers to reconsider traditional paper-based job and talent search models.

- Digital credentials enable employers to view student information quickly and easily, offering students and learners a swift and agile approach to sharing validated knowledge and skills with potential employers.

- The increased focus in K-12/primary-secondary education on offering more work-based programs fits well with this ability to capture and track specific skills to share with employers. It also holds the potential to capture other nontraditional course and program completions (including for faculty) as K-12 organizations struggle with shortages of staff for traditional instructional delivery models.

- Employer-funded education is growing rapidly as organizations (such as Guild Education and workforce agencies) connect employees with many programs across a variety of institutions. This employer learning market helps corporations educate and train employees with high-demand skills. Additionally, it enables individuals to enter the workforce sooner while they still have a trajectory for new career opportunities.

### Obstacles

- Currently, there is no widely used digital credentialing infrastructure or common standards to easily store, share and display credentials that offer a comprehensive picture of learning experiences with employers and training institutions.

- Although digital/alternative credentials are gaining public acceptance, more education is still needed, as progress is hampered by a relative lack of understanding of what they are and how they are defined.

- Until all institutions establish habits to deliver any credential (formal/informal, traditional/new, badge/diploma) in digital format, they will struggle to understand the true essence of digital society, and needs and expectations of their students, partners and community.

- Questions linger about the degree to which digital/alternative credentials can displace traditional diplomas, and the extent to which they will gain employer acceptance.

### User Recommendations

- Gain familiarity with current digital credentialing technology and standards organizations — such as Credential Engine, IMS Global Learning Consortium and The Groningen Declaration Network — by participating in these organizations regarding growing digital credential ecosystem and global standards.

- Form a community of interest by establishing a team of academic leaders, faculty, corporate partners and administrators to initiate organizational conversations and build a foundation for digital credentials objectives.

- Search for an appropriate use case of current digital credentialing technology at your institution or organization, by initiating a pilot to help institution leaders consider the policy implications, growing ecosystem and corporate readiness for this new digital currency.

### Sample Vendors

Accredible; Accreditrust Technologies; BadgeCert; Digitary; Edalex; Hyland Software; Instructure; Parchment; Pearson (Credly); Smart Certificate

### Gartner Recommended Reading

Changing Economic Conditions Impact How Education Delivers New Credentials

**Citizen Developers**

**Analysis By:** Jason Wong

**Benefit Rating:** High

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

**Maturity:** Mature mainstream

### Definition:

Citizen developers are employees not in the IT organization who create or extend technology capabilities. They use low-code, no-code and generative AI development tools and runtime environments sanctioned by corporate IT or the business units. A citizen developer is a subsegment of business technologists. However, it is not a title, role or professional developer in the business unit, but rather a persona taken on by an employee.

### Why This Is Important

Defining and embracing citizen development is essential to the maturing digital workplace strategy. The changing ways of work have accelerated the need for greater business agility and putting better tools in the hands of employees so they can more rapidly solve their problems with new digital capabilities. According to the 2022 Gartner Digital Worker Survey, 48% of non-IT workers customize or build tools from technology provided by IT or from tools they acquire on their own (see What Workers Want: Top 10 Insights From the Digital Worker Experience Survey).

### Business Impact

The long-term strategic impact of citizen development is enabling self-service business innovation within business units and fostering fusion teams that blend business and technology expertise. Citizen developers are often aided by IT in some aspects of co-creation or technical support. Citizen development communities of practice and hackathons have proven to help promote and enhance digital dexterity across the enterprise.

### Drivers

- The workforce is changing to being more tech savvy. On average, 69% of the respondents in the 2022 Gartner Digital Worker Survey stated improving their personal digital skills to be important for business success.

- Employees have easier access to more tools than ever before, and it's only increasing. Citizen developers feel more empowered by powerful low-code development tools and SaaS-based no-code tools that specifically cater to them. Many business application vendors now provide robust low-code and no-code development capabilities, making it easier for citizen developers to develop their own solutions — even ones that once required professional development skills, such as building mobile apps or using AI automation services like chatbots.

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

**Obstacles**

- Citizen development is not shadow IT. IT's resistance to recognizing business technologists' work and embracing citizen development results in missed opportunities to drive toward business and IT alignment.

- IT leaders also often fear losing control on account of increasing citizen development activities, making their teams less relevant or burdening IT with unmaintainable apps. However, the risks of citizen development are typically outweighed by the benefits. Risks to the enterprise can be better managed by directly addressing inadequate tooling and disorganized support for a citizen development community, which are key factors leading to poor outcomes and risky apps.

- IT leaders often don't understand the levels of ambition that exist in their organization and don't have a plan to support those ambitions. Citizen development is on a digital dexterity continuum that progresses from digital citizen to digital side hustle to business technologist.

**User Recommendations**

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

- Mitigate risks by working with business unit leaders and citizen developers to establish trust; clarify ownership and accountability expectations; and define safe activity zones.

- Enable self-governing citizen development practices by fostering a community of practice (CoP) across business units and with IT.

- Improve outcomes for citizen-developed apps by joint (business and IT) selection of the right tools and enabling technologies.

**Sample Vendors**

Airtable; Creatio; Kissflow; Microsoft; Project Management Institute (PMI); Quixy

**Gartner Recommended Reading**

Quick Answer: What Types of Fusion Teams Do Business Technologists Lead?

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

What Are the Digital Dexterity Skills Necessary to Support New Ways of Working?

Case Study: Kick-Starting a Low-Code/No-Code Community of Practice (Heathrow Airport)

## Appendixes

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<br>Pilots and deployments by industry leaders | First generation<br>High price<br>Much customization |
| Adolescent | Maturing technology capabilities and process understanding<br>Uptake beyond early adopters | Second generation<br>Less customization |
| Early mainstream | Proven technology<br>Vendors, technology and adoption rapidly evolving | Third generation<br>More out-of-box methodologies |
| Mature mainstream | Robust technology<br>Not much evolution in vendors or technology | Several dominant vendors |
| Legacy | Not appropriate for new developments<br>Cost of migration constrains replacement | Maintenance revenue focus |
| Obsolete | Rarely used | Used/resale market only |

Source: Gartner (July 2023)

# Recommended by the Author

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

Understanding Gartner's Hype Cycles

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

Future of Work Reinvented: Shifting Talent and Skills

The Future of Frontline Work

How to Use Talent Resources More Effectively in a Constrained Environment

Uncover the Hidden Impact of AI Automation on Your Organization

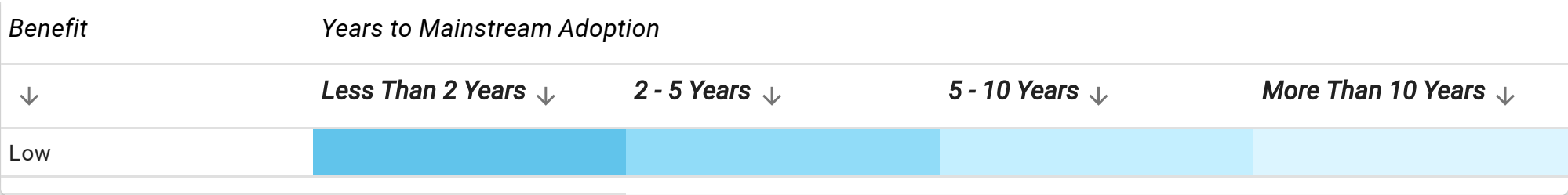Use Talent Ecosystems to Enhance Your Workforce

Case Study: Skills Transformation Process (Lumen)

## Table 1: Priority Matrix for Hype Cycle for Workforce Transformation, 2023

| Benefit | Years to Mainstream Adoption | | | |
|---|---|---|---|---|
| ↓ | Less Than 2 Years ↓ | 2 - 5 Years ↓ | 5 - 10 Years ↓ | More Than 10 Years ↓ |
| Transformational | Digital Credentials<br>Hybrid Work<br>Hyperautomation | Collaborative Workflow Automation<br>Connected Factory Worker<br>Digital Side Hustle<br>Everyday AI | Internal Talent Marketplaces<br>Responsible AI | Radical Flexibility/Flexible Work |
| High | Citizen Developers<br>Generative AI-Enabled Applications | Agile Learning<br>Augmented Reality<br>Next-Gen WFM | AI-Enabled Skills Management<br>Autonomous Things in Manufacturing<br>Coaching/Mentoring Applications<br>Four-Day Workweek<br>Frontline Worker EXTech<br>Global Employer of Record Solutions | Digital Twin of the Employee<br>Workforce Nudgetech |
| Moderate | | External Workforce Procurement<br>Next-Gen Talent Assessments<br>Virtual Reality | Immersive Experience | |

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

Source: Gartner (July 2023)

## Table 2: Hype Cycle Phases

| Phase ↓ | Definition ↓ |
| --- | --- |
| *Innovation Trigger* | A breakthrough, public demonstration, product launch or other event generates significant media and industry interest. |
| *Peak of Inflated Expectations* | During this phase of overenthusiasm and unrealistic projections, a flurry of well-publicized activity by technology leaders results in some successes, but more failures, as the innovation is pushed to its limits. The only enterprises making money are conference organizers and content publishers. |
| *Trough of Disillusionment* | Because the innovation does not live up to its overinflated expectations, it rapidly becomes unfashionable. Media interest wanes, except for a few cautionary tales. |
| *Slope of Enlightenment* | Focused experimentation and solid hard work by an increasingly diverse range of organizations lead to a true understanding of the innovation's applicability, risks and benefits. Commercial off-the-shelf methodologies and tools ease the development process. |
| *Plateau of Productivity* | The real-world benefits of the innovation are demonstrated and accepted. Tools and methodologies are increasingly stable as they enter their second and third generations. Growing numbers of organizations feel comfortable with the reduced level of risk; the rapid growth phase of adoption begins. Approximately 20% of the technology's target audience has adopted or is adopting the technology as it enters this phase. |
| *Years to Mainstream Adoption* | The time required for the innovation to reach the Plateau of Productivity. |

| Phase ↓ | Definition ↓ |
|---|---|

Source: Gartner (July 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

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

Source: Gartner (July 2023)