Gartner.

Hype Cycle for Enterprise Architecture, 2020

Published: 3 September 2020   **ID:** G00467339

Analyst(s): Philip Allega

Enterprise architecture responds to disruptive forces by identifying and analyzing desired business outcomes. Agile, digital and the pandemic are factors clarifying the value of the discipline and the role, and its near neighbors, serve to make smarter decisions.

Table of Contents

List of Tables

List of Figures

Analysis

What You Need to Know

Leading enterprise architects support business and IT executives by identifying and analyzing business value derived from technology. Digital and pandemic disruptions have heightened expectations for helping leadership teams determine which, and when, technologies will deliver business outcomes. In turn, estimating and/or monitoring business value expected, or realized, shapes future technology innovation decisions. The starting point is business architecture and innovation management.

Agile and digital are forcing this role and other types of "architects" to analyze how they support solution delivery. Deliverables consumed by delivery teams provide input to transparent governance, assurance and compliance monitoring. These deliverables are commissioned by enterprise architecture (EA) to provide guardrails to delivery efforts. This role, in turn, monitors, assesses, and predicts the impact of compliance and noncompliance for leadership teams. EA services form the basis to show where, when, and who the role supports in making smarter decisions about future investments, in-progress delivery, and current investments.

The Hype Cycle

IT executives continue to require support in understanding the impact of change upon both the business, which consumes technology, and the IT estate, which must be managed over time. Those who have this requirement need analytical assessment support to:

- Analyze enterprise interdependencies inside and outside the organization.

- Analyze the impact of changing business and operating models to achieve alternative business outcomes.

- Monitor, analyze and predict change impacts when:

    - Planning future investments (e.g., innovation management, trendspotting, continuous foresight)

    - Aggregating the state of in-progress investments (e.g., agile project management, agile architecture, continuance compliance automation, continuous delivery)

    - Determining the state of what's in production (e.g., strategy realization office, DigitalOps [see Note 1], continuous quality)

The discipline that supports these requirements is enterprise architecture. The person who fulfills these requirements is an enterprise architect.
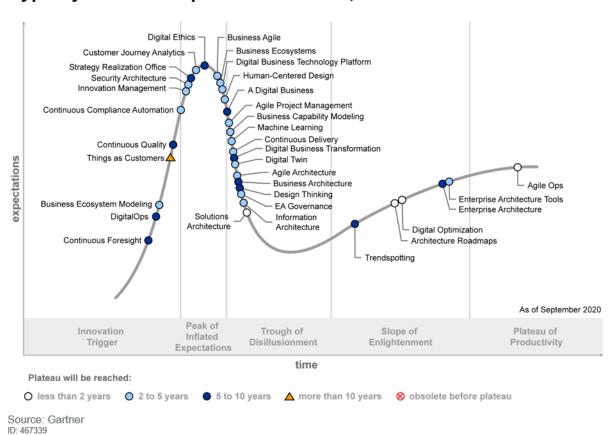
Things as customers has returned to the Hype Cycle after a two-year hiatus because of the pandemic, yet this innovation is expected to take more than 10 years to reach the plateau. Business ecosystem modeling, innovation management, security architecture and customer journey analytics are prepeak — all are expected to plateau in two to five years. The pandemic has stalled or slowed the advancement of some innovation profiles toward the plateau (e.g., business capability modeling, business architecture, EA governance, information architecture, and solutions architecture). Each has deep roots in EA and is approaching the Trough of Disillusionment, before achieving significant impact in the long term.

Pandemic scenario planning may lead to recovery and renewal, or possibly resurgence. Enterprise architects must:

- Quickly respond to trends that change business direction and strategy.

- Analyze business and operating model change against processes, information, technologies, and applications for executives and technologists to make smarter investment decisions.

- Bring role clarity to "architects" by defining EA services as part of an internal management consultancy role to leaders.

Figure 1. Hype Cycle for Enterprise Architecture, 2020

Hype Cycle for Enterprise Architecture, 2020

The Priority Matrix

The Priority Matrix shows that many transformational and high-benefit technologies are clustered in the two- to five-year and five- to 10-year time frames before adoption by the mainstream. The technologies in the two- to five-year time frame differ greatly from the techniques of EA teams focused on solution delivery alone. The speed to mainstream adoption underscores the effect of digital business adoption on EA teams today. Only four technologies will reach maturity in two years: digital optimization (see Note 2), architecture roadmaps, agile ops and solutions architecture. This reflects the changing role of EA in support of business and IT requirements.

One immediate concern is digital optimization. This strategy is employed by those not experiencing near-term disruptions. For enterprise architects in such organizations, this transformational approach should be taken advantage of immediately. Those using this approach with leadership teams will benefit from the rapid deployment of digital technology to improve existing operating processes and business models.

Key two- to five-year technologies for EA include:

- Innovation management

- Business agile

- Digital business technology platform

- Machine learning

- Digital twin

- EA governance

Key less-than-five-year use cases for EA include:

- Business ecosystem modeling

- Security architecture

- Customer journey analytics

- Business ecosystems

- Human-centered design

- Business capability modeling

Figure 2. Priority Matrix for Enterprise Architecture, 2020

Priority Matrix for Enterprise Architecture, 2020

benefit	years to mainstream adoption			
	less than two years	two to five years	five to 10 years	more than 10 years
transformational		Agile Project Management Business Agile Digital Business Technology Platform Digital Twin EA Governance Innovation Management Machine Learning	A Digital Business Digital Business Transformation DigitalOps Strategy Realization Office	
high	Agile Ops Architecture Roadmaps Digital Optimization	Business Capability Modeling Business Ecosystem Modeling Business Ecosystems Continuous Delivery Customer Journey Analytics Enterprise Architecture Tools Human-Centered Design Information Architecture Security Architecture	Business Architecture Continuous Quality Design Thinking Digital Ethics Enterprise Architecture Trendspotting	Things as Customers
moderate	Solutions Architecture	Agile Architecture Continuous Compliance Automation	Continuous Foresight	
low				

As of September 2020

Source: Gartner
ID: 467339

Off the Hype Cycle

We continue to refine and delete technologies that appeared in previous Hype Cycles. Our approach to identifying and tracking key terms includes:

- Evaluating their breadth of interest by analyzing the volume of public internet searches for specific innovation profiles

- Evaluating targeted IT market interest by analyzing searches on gartner.com

- Noting mentions in inquiries with clients during the calendar year

- Assessing anecdotal media mentions and reporting

The following technologies have significantly declined in interest on gartner.com, public internet search, and Gartner inquiry:

- **Continuous planning.** A shift toward continuous foresight for tactical and strategic assessments of the attractiveness of technology in light of nontechnology trends has superseded this concept. Organizational resilience concepts have also taken a more forward-looking concern in light of the pandemic, which we believe has significantly reduced interest in this area.

- **ContinuousNext.** The concepts of supporting continuous monitoring for multiple purposes are evolving, as seen with "continuous planning" as well. This concept lost traction in the marketplace.

The following technology has reached a critical mass where it is on the plateau:

- **EA frameworks.** EA frameworks and associated methodologies are well-known. We find that these are used for inspiration and not aspiration. For most, they are not used as a means to create deliverables for their own sake.

On the Rise

Continuous Foresight

Analysis By: Marty Resnick; Frank Buytendijk

Definition: Continuous foresight leverages the best practices of strategic/corporate foresight and futurism to continuously test business models and strategies, and determine how to adjust either or both to create future success. Continuous foresight is a methodology applying a discipline to identifying and assessing trends and projections, as well as backcasting from desirable futures. Along with continuous planning, continuous foresight will help support the process of preparing for and responding to a world of continual change.

Position and Adoption Speed Justification: There is no doubt we are all living in a time of disruption and uncertainty. Of course, Coronavirus (COVID-19) is the current cause of this extreme disruption but organizations know that there are many other disruptions and trends that need to be responded to, and better yet, anticipated. Organizations can use continuous foresight as a definite way to connect the dots between acquiring trends through turning those findings into action. This is where continuous foresight is used to define that process in a meaningful way.

User Advice: Organizations need to focus on continuous foresight for introducing new technology strategies, operating models and technology responses to support their need to reevaluate business models. The new normal is not a repeat of how organizations operated before the

pandemic, but an opportunity to create a new emerging normal. This pandemic has confirmed one thing, it is that the world is fast changing and the ability to just respond to disruptive events isn't enough. Users should leverage continuous foresight to:

- Illuminate potential blind spots and other unknowns to provide anticipatory strategies for responding to multiple types of disruptive forces.

- Use four action sets — we call the ASAP model (acquire, synthesize, advocate and prepare) — providing a common methodology across the organization for tracking signals and trends.

- Develop a toolkit of trend analysis techniques for each stage of the methodology to plan for an actionable response to disruptions.

- Assign actions based on the nature and certainty levels of the future horizons for each disruptive trend, and continuously monitor impacts of those actions.

Business Impact: Focus on continuous foresight will act as a catalyst to introducing new strategies, business and operating models, and technology responses to support their organizations' need to reevaluate business models. The new normal is not a repeat of how organizations operated before the pandemic, but an opportunity to create a new emerging normal. Organizations will strive to become future-fit so any disruption may be spotted early and a reactive response becomes a proactive one. This will lead to:

- Hiring enterprise architecture and technology innovation leaders that focus on innovation, foresight, and strategic thinking as key requirements.

- Innovation labs and trendspotting groups will grow across industries.

- The role of the chief futurist will become prevalent.

- Demand for tools will increase that facilitate trendspotting, innovation management and continuous foresight.

Benefit Rating: Moderate

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: Fibres Online; Futures Platform; ITONICS; TRENDONE

Recommended Reading: "Inventing the Future With Continuous Foresight"

"Top 10 Plausible Directions Resulting from COVID-19"

"Don't Make Predictions and Choices, Instead Create Options by Using Scenario Planning for Pandemic Recovery"

DigitalOps

Analysis By: Derek Miers

Definition: DigitalOps enables rapid transformation and recomposition of operational models and components by directly linking them to business strategy and outcomes. It focuses on exploiting the automation aspects of BPM, including decision management and event processing, along with agile methodologies for continuous delivery of business improvement in applications to deliver a step-change improvement in business agility.

Position and Adoption Speed Justification: DigitalOps represents the "business" center of a digital business technology platform, coordinating and orchestrating systems and other resources that may sit outside the corporate firewall. Underpinning the orchestration and coordination, DigitalOps environments incorporate mechanisms for process modeling, sensing/analyzing (process mining, event detection and performance metrics) and responding (real-time operational decision models), and dynamic optimization (applying artificial intelligence and machine learning). A few vendors have some parts of the needed functionality:

- Most iBPMS vendors have the core capabilities to enable DigitalOps, although they seldom have the event-driven mechanisms needed to scale.

- EBPA vendors have started to develop innovative ways of visualizing the operating model and linking that to performance reporting and continuous intelligence.

- APIs, multigrained services and RPA approaches have overcome most integration challenges.

- LCAP, process mining and machine learning algorithms have only a peripheral role today.

Like DevOps, DigitalOps is not a "system" to buy — it's more of an approach or mindset. Most end-user organizations have yet to recognize the opportunity and benefits. For this reason, year-on-year adoption has stalled.

User Advice: EA and technology innovation leaders should:

- Sell the benefits of using business-centric models and technologies in a layered approach (business, IT, third party) to drive digital transformation in operations to their executive team. With broader understanding of these benefits, it becomes much easier to develop business product offerings that leverage automation.

- Shorten the time needed to implement and evolve business product offerings by reconsidering their organization's approach to business processes, decision models and associated tooling. Identify how these types of models can help to automate interactions at scale on the digital technology platform.

- Identify where automated decision management systems fit by exploring Decision Model and Notation (DMN) with a view toward radically simplifying processes. With all the variation captured in an executable decision model, a process that had 70 to 100 steps may reduce to less than 10 steps.

- Engage product development teams to co-create their future services together. Make reusability a priority by helping them translate customer journey maps into phased value streams, looking for shared capabilities within each phase and then developing more granular product descriptions for the common aspects of these business capabilities. Identifying the right level of

granularity in these common business capabilities will enable reuse across a wide set of product scenarios.

- Integrate external processes and engines, as well as legacy data and applications where needed, by developing configurable interfaces based on multigrained services, APIs or (as a last resort) RPA tools. With careful attention to data design and configuration, the interfaces can then support multiple processes and products.

- Ensure careful governance of all the different elements (processes, decision models, common integration components, configurations) over time. They will often have different and distinct life cycles, as well as a diverse set of stakeholders.

Business Impact: DigitalOps provides the basis for an emergent approach to business operations. By applying a DigitalOps approach to better support execution within business operations, the organization can move from planning and definition of strategic goals to the clarification of that intent through to the orchestration of resources in the digital platform. Alternatively, the organization can focus on the industrialization of common components (complete with integrated engines and external services), which are then amenable to later configuration and extension to create new and innovative products for execution on the digital platform. DigitalOps:

- Enables the dynamic optimization and recombination of products and services through industrialized common process components, underpinning reuse of these elements and scaling new offerings in the market.

- Coordinates and balances customer expectations and corporate goals/objectives within each product offering, while driving the alignment of business operations.

- Ameliorates the first-mover advantages of digital disruptors by enabling a "fast-follower" business strategy, allowing both Mode 1 and Mode 2 operations to coexist and cross over.

Benefit Rating: Transformational

Market Penetration: Less than 1% of target audience

Maturity: Embryonic

Sample Vendors: Appian; Bizagi; IBM; Pegasystems

Recommended Reading: "DigitalOps Helps Connect Business Models to the Digital Business Platform"

"Use Co-Creation Workshop Techniques to Enable Innovation and Drive Transformation"

"How to Industrialize and Reuse Core Product Capabilities and Processes With DigitalOps Initiatives"

"Drive Knowledge Worker Productivity by Deconstructing Your Process Architecture With DigitalOps"

Business Ecosystem Modeling

Analysis By: Marcus Blosch

Definition: A business ecosystem model is a dynamic network of entities (people, businesses and things) interacting with each other to create and exchange sustainable value for participants. Business ecosystem modeling is focused on extending the scope of enterprise architecture (EA) to the business ecosystem of customers, suppliers, devices, partners and organizations that make up an organization's ecosystem.

Position and Adoption Speed Justification: Although it is at an early stage, business ecosystem modeling is practical and desirable, and an important input into digital strategy (see "The Gartner Digital Ecosystem Framework: How to Describe Digital Ecosystems in the Digital Age"). There are clear case studies of business ecosystem modeling, so we place business ecosystem modeling at post-trigger 35% on the Hype Cycle. For organizations with experience in business-outcome-driven EA, business ecosystem modeling is a natural step. Modeling business ecosystems is the entry point for the development of the digital twin of the organization. For this reason, we position the time to plateau at two to five years.

User Advice: Business ecosystem modeling extends the scope of EA beyond a purely internal focus into the ecosystem and the relationships, information and systems that connect it. Many EA techniques remain the same. However, the goals and focus now extend beyond the boundaries of the home organization, looking at how the ecosystem shapes the business model and opens up opportunities for innovation (see "5 Digital Ecosystem Types that Will Impact Every Enterprise").

The organization defines business outcomes that require increased collaboration in the ecosystem (for example, many organizations begin with a focus on closer collaboration with their suppliers). Therefore, enterprise architects can show how EA can support the design and setup of these collaborative relationships with the techniques illustrated here. Many business executives are often unaware that the EA team can play a role in creating these business ecosystems. As such, the EA team and its sponsor (such as the CIO) must take the opportunity to sell the concept whenever possible (see "Better Business By Design With the Business Architecture Landscape").

Explore new vendors that support visual renditions of the ecosystem, and support feeds from existing systems that visualize value exchange within the ecosystem.

Business Impact: Business ecosystems are set to become a major source of opportunity and innovation for all organizations. Organizations that can leverage the customers, information and capabilities available to them in the business ecosystem can create new business models far faster than would be possible with traditional approaches. This will require organizations to develop the skills, models and tools needed to create these business ecosystems.

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: Avolution; BiZZdesign; Kumu; Mavim; Tr3Dent

Recommended Reading: "Eight Ways Ecosystems Supercharge Business Models"

"5 Digital Ecosystem Types that Will Impact Every Enterprise"

"Better Business By Design With the Business Architecture Landscape"

"The Gartner Digital Ecosystem Framework: How to Describe Digital Ecosystems in the Digital Age"

Things as Customers

Analysis By: Don Scheibenreif; Mark Raskino

Definition: A thing (or machine) customer is a nonhuman economic actor that obtains goods or services in exchange for payment. Examples include virtual personal assistants, smart appliances, connected cars and IoT-enabled factory equipment. These thing customers act on behalf of a human customer or organization.

Position and Adoption Speed Justification: Today there are more internet-connected machines with the potential to act as customers than humans on the planet. We expect the number of machines and ambient artificial intelligence (AI), like virtual personal assistants, with this capability to rise steadily over time. They are increasingly gaining the capacity to buy, sell and request service. Things as customers start simply by alerting human counterparts that they need attention. However, things will advance beyond the role of simple informers to advisors and, ultimately, decision makers. According to Gartner research, both CEOs and CIOs agree on the potential of this emerging trend. Forty-nine percent of CIOs and 25% of CEOs we surveyed in 2019 believe demand from machine customers will become significant in their industry by 2030. These leaders believe at least 25% of all consumer purchases and business replenishment requests on average will be delegated to machines. Today, most things simply inform or make simple recommendations. We do see some examples of things as more complex customers emerging, such as smart grid technologies. HP Inc. embraced this future when it created Instant Ink — a service that already enables connected printers to automatically order their own ink when supplies run low. Some Tesla cars already order their own spare parts, and Walmart has patented grocery autoreordering based in home IoT sensing. In B2B, U.S.-based industrial supply company Fastenal uses smart vending machines that proactively place orders when stocks run low. Thinking forward, an autonomous vehicle could determine what parking garage to take its human passengers to based on criteria such as distance from destination, price, online review score, parking space dimensions, valet options, etc. In this case, it is the parking garage marketing to the car, not the humans.

This is a long-term proposition and there are major barriers, hence the early position on the Hype Cycle. The largest barrier is trust. Can the human customer trust the technology to accurately predict and execute? And, can the machine customer trust the organization that offers the service? Other barriers include: complex AI technologies, security and risk, regulatory compliance issues, and data sharing. All this will mean that things as customers across industries will not reach the Plateau of Productivity for five to 10 years.

User Advice: We recommend the following:

- Create a "tiger team" of architects, engineers, data scientists, economists, linguists, psychologists, and business decision makers to explore the business implications of machine customers. Determine whether the enterprise has the right capabilities, processes, and systems to identify, serve, communicate, and take orders from machines as customers.

- Follow examples from organizations like Tesla, Google, Amazon and Caterpillar to look for evidence of capabilities and business model impact.

- Build your organization's capabilities around artificial intelligence over the next five years. First in machine learning, then extending to other facets involved in machine customers processing information and making informed decisions.

- Identify use cases where your products and services can be extended to thing customers and pilot those ideas to understand the technologies, processes and skills required. Start with simple use cases driven by rules that can be easily configured and controlled by customers.

- Create scenarios to explore the market opportunities. Initiate collaboration with your chief digital officer, chief data officer, chief strategy officer, sales leaders, chief customer officers and others to explore the business potential of machines as your customers.

- Be mindful of the very real barriers. The complexity involved in developing a thing customer that can learn the depth and breadth of knowledge and preference trade-offs required to act on behalf of a human customer in a variety of situations is complex. Some humans may initially be uneasy about delegating purchasing functions to machines. Consider what ethical standards, legal issues and risk mitigation are needed to operate in a world of machines as customers.

Business Impact: Over time, trillions of dollars will be in the hands of nonhuman customers. This will result in new opportunities for revenue, efficiencies and managing customer relationships. Digital-savvy business leaders seeking new growth horizons will need to reimagine both their operating models and business models to take advantage of this ultimate emerging market, whose numbers will dwarf the number of human customers on (and one day perhaps off) the planet. How do you sell to a thing? What will get a thing to buy from you when its decisions are based on algorithms, not emotion? How will your human customer service agents handle requests from millions of things? What does "customer experience" even mean for a thing? Things as customers have the potential to generate new revenue opportunities, improve productivity, increase operational efficiency, improve health/well-being and enhance security of physical assets and people. They will also result in new sources of competition, fraud, legal and taxation challenges, and operational challenges (like how to provide customer service for things).

Benefit Rating: High

Market Penetration: Less than 1% of target audience

Maturity: Emerging

Sample Vendors: Amazon; AutoCrib; Caterpillar; Google; Tesla

Recommended Reading: "Machine Customers: The Next Massive Emerging Market"

"How Customer Experience Changes When Your Customer Is a Thing"

"Why Machine Customers May Be Better Than Human Customers"

"IoT-Based Thing Commerce Requires a Differentiated Customer Experience"

"The Future of Customer Self-Service: The Digital Future Will Stall Without Customer-Led Automation"

Continuous Quality

Analysis By: Joachim Herschmann; Jim Scheibmeir

Definition: Continuous quality is a systematic approach toward process improvement to achieve the quality goals of business and development. A continuous quality strategy fosters a companywide cultural change to achieve the goal of making "quality" the responsibility of all. It synchronizes quality assurance and testing with DevOps processes and encompasses the practices that help mitigate risks before progressing to subsequent stages of the software development life cycle.

Position and Adoption Speed Justification: Many organizations are on a journey with DevOps, practicing continuous integration and continuous deployment, yet a continuous approach to quality is often missing. The ability to consistently deliver business value with high quality has become critical for organizations seeking to mature their DevOps processes. Continuous quality encourages a holistic and proactive approach with functional and nonfunctional requirements driving the design, development and delivery of products.

Continuous quality involves engaging stakeholders across the organization and empowering them to be more accountable and to seek out opportunities for improvement. Such a holistic approach can be seen as restrictive and requires consensus for usage across all team members. Organizational silos, traditional top-down management structures and lack of experience with continuous quality can impede adoption rates. These challenges will be overcome only when organizational maturity and the necessary culture change expand effectively across the broader organization, and as DevOps practices and projects mature.

User Advice: Application and I&O leaders should:

- Move from a traditional application or project-centric model of quality to a holistic quality approach by adopting an ecosystem-centric view of quality.

- Promote a continuous quality mindset by involving stakeholders across the organization.

- Allocate ownership and appoint staff with the required skills needed for continuous quality by identifying the required roles, technologies and practices.

- Enable collaboration with UX design and CX teams to infuse quality right from the inception of an idea.

Page 14 of 72   Gartner, Inc. | G00467339

- Establish relevant quality metrics based on the objectives that your DevOps teams are trying to accomplish. Draw on ideas from Gartner's DevOps metrics pyramid.

- Task your teams with developing continuous quality practices before choosing tools.

Business Impact: The adoption of a continuous quality strategy significantly improves an organization's ability to serve and delight its customers. Continuous quality enables solutions to be delivered at a greater release rate and with fewer defects than traditional quality control practices. It provides the framework for operational excellence that drives value, supports the realization of business outcomes for customers and streamlines operational processes. Operating this way challenges traditional quality control practices, and is instrumental in breaking down silos, rewarding collaboration and creating continual improvement.

Continuous quality supports both "shift left" and "shift right" testing. Testing can occur before software development begins through requirements vetting, and can exist in future states, such as A/B testing or using canary releases in production. Managing quality proactively and continuously will increase the speed at which digital solutions are delivered by creating a timely and accurate feedback loop about what is working and what is not working.

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: AppDynamics; BlazeMeter; Eggplant; IBM; Micro Focus; Neotys; New Relic; SmartBear

Recommended Reading: "Innovation Insight for Continuous Quality"

"Promote Continuous Quality for APIs to Support Digital Business"

"Quality Is the Key to Avoiding 'Digital Distortion' With Your Augmented Reality Strategy"

"Take a 'Shift Left' Approach to Testing to Accelerate and Improve Application Development"

"Adopt a Performance Engineering Approach for DevOps"

"Avoid Digital Quality Disasters With Continuous Autonomous Validation and Verification"

"Maverick* Research: Software Testing and the Illusion of Exterminating Bugs"

Continuous Compliance Automation

Analysis By: Hassan Ennaciri

Definition: Continuous compliance automation (CCA) integrates compliance and security policy enforcement into a DevOps delivery pipeline. CCA codifies and continuously applies compliance policies and controls while monitoring, correcting and protecting against vulnerabilities resulting

from coding defects and misconfiguration. It reduces manual execution steps in adhering to regulatory requirements, enhancing consistency, traceability and audibility. CCA helps reduce costly delays caused by fixing compliance problems that often occur late in the SDLC.

Position and Adoption Speed Justification: Growing DevOps initiative success continues to drive enterprise investments in compliance automation. CCA improves release velocity and reliability while simplifying compliance enforcement via automation. Policy-driven, automated controls improve compliance without impacting the flow of the software delivery value stream.

Traditional compliance practices are incompatible with continuous software delivery processes, leading to slower delivery and unexpected remediation work. CCA is a necessary approach that DevOps teams need to implement to realize the benefits of continuous delivery of value.

Compliance automation tools for DevOps are changing and evolving rapidly as there many vendors that cover different subdomains across applications, infrastructure and databases.

User Advice: DevOps teams must adhere to compliance, governance and security requirements while creating a leaner operating environment. CCA tools enable them to achieve both goals: improving value stream delivery and mitigating risks.
DevOps teams must consider the following actions when integrating compliance testing into DevOps delivery pipeline:

- A shift-left approach to ensure that compliance controls are well understood earlier in the development process. This includes implementing automated compliance checks at every phase of the pipeline.

- Investments in tools that enable CCA at scale and can provide a continuous approach to prevent, detect and correct audit failures.

- Enforcement of security and compliance across all domains, including databases, application code, infrastructure and open-source software (OSS). Since there is no single vendor tool that covers all those domains, DevOps teams must use multiple compliance automation tools and integrate them across all phases of the delivery pipeline.

Business Impact: Organizations evolving their DevOps practices and avoid risks and penalties by embedding automated compliance into their delivery pipelines.

Platform and product engineering teams must use compliance automation tools to meet the requirements of regulatory frameworks such as the SOC 2 System and Organization Controls, the National Institute for Standards and Technology [NIST] Special Publication (SP) 800-53, NIST CSF, Payment Card Industry (PCI), the International Organization for Standardization (IOS)/International Electrotechnical Commission (IEC) 27001, the Health Insurance Portability and Accountability Act (HIPAA), or the Sarbanes-Oxley Act (SOX).

As organizations face an increasing number of regulatory obligations, automating compliance will become even more valuable to I&O leaders. In our 2019 DevOps Survey, 98% of respondents indicated that they are using DevOps in regulated situations. Further, respondents indicated that they need to comply with an average of three regulations.

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: Check Point Software Technologies; Checkmarx; Chef; Fugue; Liquibase (formerly Datical); Qualys; Rapid7 (DivvyCloud); Redgate; Sonatype; Veracode

Recommended Reading: "3 Steps to Ensure Compliance and Audit Success With DevOps"

"3 Steps to Integrate Security Into DevOps"

"Market Guide for Compliance Automation Tools in DevOps"

At the Peak

Innovation Management

Analysis By: David Cearley; Marty Resnick

Definition: Innovation management is a business discipline that aims to instill a repeatable and sustainable innovation process or culture within an organization. Innovation is defined here as the creation of ideas, processes, tools and technologies that enhance business value.

Position and Adoption Speed Justification: From an enterprise architecture (EA) perspective, Gartner positions innovation management as "on the rise" with a prepeak position. There is a growing set of examples whereby EA and technology innovation leaders are getting in front of the business strategy curve by increasing their focus on technology innovation. EA is shifting toward internal management consultancy and enabling continuous innovation throughout the organization. EA accomplishes this by facilitating and developing innovation management as a growing expectation for the EA discipline.

Enterprise architecture and technology innovation leaders must recognize that managing innovation and the act of innovating are not the same. Innovation management enables an organization to:

- Use trendspotting to proactively scan the horizon for emerging technologies that could disrupt or create new opportunities for your business, and act on those disruptive forces.

- Reimagine business capabilities and processes by using emerging technologies and trends as inspiration to provide deep insights into optimizing or creating new business models that drive competitive advantage through innovation.

- Evaluate the growing impact of trends and how to deal with them as well as deliver forecasts, perspectives and insights to help leaders plan using strategic foresight and other methodologies.

- Facilitate the processes and practices of innovation by enabling leaders to guide the focus on innovation and to quickly trigger and expose deep thinking aimed at eliciting exceptional ideas, exposing new insights, identifying new opportunities, resolving obstacles, removing barriers or speeding decisions.

User Advice: Our research indicates that when EA and technology innovation leaders engage in innovation in a thoughtful and deliberate way, there is substantive value that is generated by the discovery of new business opportunities.

EA and technology innovation leaders will need to recognize that doing this requires a very different approach and perspective, a new set of tools, additional training (i.e., design thinking, human-centered design, etc.) and experience, with a focus on innovation management across the enterprise. EA must facilitate the treatment of innovation strategically, with a focus on achieving business outcomes and enabling the rest of the organization with the tools, processes and support to move effectively through the various stages of innovation.

Creativity and innovation can occur naturally in any organization, but EA and technology innovation leaders responsible for innovation and aiming to maximize its impact need it to be intentional and methodical. A successful innovation management program seldom depends on technology for its success. It requires clear goals to focus and inspire innovation, a culture that encourages people to bring new ideas to the table, and a process that can see those ideas through to prototype and implementation, repeatedly.

Business Impact: All areas of the business are being affected by disruptive forces and need to respond by innovating products and services. EA and technology innovation leaders must support an environment of creativity and innovation. EA should facilitate ideation from diverse areas of the business in an intentional and structured way through innovation management. Ideas that will have the most impact on the business will be actionable and help achieve business outcomes. Ideas may not always result in a product but may lead to continuous improvement, intellectual property, trademark and/or new processes.

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Early mainstream

Sample Vendors: Brightidea; Crowdicity; Exago; HYPE; ITONICS; Planbox

Recommended Reading: "Market Guide for Innovation Management Tools"

"Inventing the Future With Continuous Foresight"

"Technology Innovation Primer for 2020"

"Survey Analysis: Innovation Lab Scenarios — How Collaborators Enable Disruptive Innovation"

Security Architecture

Analysis By: James McGovern

Definition: Security architecture is the discipline and associated process of planning and designing organizational, conceptual, logical and physical components that interact in a coherent fashion. It is aligned with business requirements in order to achieve and maintain a known and acceptable state of security-related risk.

Position and Adoption Speed Justification: Organizations are increasing their focus on security architecture as a critical component of their business strategy. As cybercrimes grow in both frequency and severity, EA and security leaders must aid in deeply embedding security into the organization's architecture. Overcoming organizational barriers between security architecture and IT stakeholders remains a challenge. EA and security leaders need to increasingly present themselves as problem solvers, not friction inducers. For this reason, we position security architecture as yet to reach the Peak of Inflated Expectations. Security architecture in large enterprises with the focus on using it to bring coherence, cost savings and a single vision has been around a long time. However security architecture practices have found themselves adrift in the face of the increased adoption of Agile and CI/CD processes. Therefore, we put the market penetration in the range of 5% to 20%, with the view that the current overall market penetration is closer to 10% and the position at pre-peak 10%.

Achieving effective security in a rapidly changing digital world requires a dedicated security program with a formal approach that embeds security into the fabric of the digital business as early in the life cycle as possible. From an architecture perspective, this means shifting the focus from providing assurance and compliance toward offering pragmatic business outcomes — the security architecture team must be a "Center of Know" rather than a "Center of No." This means approaching security architecture from an outside-in and outside-out (ecosystem) perspective in a manner that addresses business processes, applications and infrastructure holistically.

User Advice: Holistic security thinking includes viewpoints of the ecosystem, business, application, information and infrastructure, and provides perspectives on building, breaking and defending critical assets. Well-designed security architectures define and enable a uniform set of security processes, practices, standards and technologies that aligns with an organization's strategic direction and addresses potential risks to minimize negative impact. It improves the ability to make security design decisions that align with business, regulatory and privacy requirements, both for conventional as well as more agile project approaches (see "Security Architecture Process for Digital Initiatives"). Security architecture is a continuous process of consulting, assessment, review and improvement to enable the adopted security principles to effectively meet the ongoing and ever changing risks in business. Organizations are increasingly supporting security architecture as a core viewpoint within EA. Enterprise architects must ensure that they are focused on creating, developing and maintaining deliverables that guide security and risk decision making by focusing on specific business outcomes rather than delivering a set of static artefacts.

While security architecture, in the context of using EA, is still comparatively new in most organizations, it is not premature to identify maturity criteria that are specific to security architecture. Such criteria should be aligned with those used for assessing EA program maturity. In "Enterprise

Architects Should Leverage a Risk-Based Approach to Understand Security in the Digital Business Ecosystem," Gartner identified six best practices that organizations need to follow to deliver an effective security architecture:

- Use a risk-based approach to security architecture. This includes risk-rating frameworks, interactive dashboards to aid in visibility and leveraging of data analytics.

- Understand the threat landscape and techniques, such as threat modeling, to ensure better alignment.

- Develop a model of your organization's business ecosystem. Take a top-to-bottom approach, starting with business relationships and continuing down to technical and operations levels.

- Identify the risks in the business ecosystem. Leverage techniques such as misuse/abuse cases to understand both strengths and weaknesses in business processes.

- Identify the most applicable security technologies, to effectively protect your organization from advanced attacks, that are aligned with a strategic approach where security is adaptive, everywhere, all the time.

- Build the capability for rapid detection and response to identify changes to risks within the ecosystem.

Business Impact: Enabling digital business while keeping risk manageable will require a new strategic approach that embraces continuous adaptive risk and trust assessment (CARTA). Given the dynamic nature of digital ecosystems, critical systems, users, services and devices must be continuously monitored and assessed for risk and trust. The digitalization of everything from employee badges to elevators, vending machines, the products and services you deliver, and the communications between and across systems inside and outside your organization, make those potential areas of risk/failure. For these reasons, we list the benefit rating of security architecture as high, while suggesting that its maturity is still in the adolescent stage.

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Early mainstream

Sample Vendors: Deloitte; Ebryx; InfusionPoints; Optiv Security; Security Architects Partners; Security Compass; Synopsys

Recommended Reading: "Definition: Security Architecture"

"Predicts 2020: Embrace Privacy and Overcome Ambiguity to Drive Digital Transformation"

"Use a Privacy Impact Assessment to Ensure Baseline Privacy Criteria"

"Introducing the Gartner Information Security Function Operating Model"

"Security Architecture Process for Digital Initiatives"

"Toolkit: Security Capabilities Framework for Midsize Enterprises"

"5 Ways EA Can Help the Organization Focus on Security"

"Enterprise Architects and SRM Leaders Can Work Together to Harden Cybersecurity"

Strategy Realization Office

Analysis By: Joanne Kopcho; Monika Sinha; Daniel Stang

Definition: The strategy realization office (SRO) is a highly mature enterprise function focused on enterprise strategy execution. It combines enterprise planning and portfolio management, change enablement, communication and program support into a single, often matrixed, unit of functions that assist the organization in accomplishing initiatives that impact the enterprise.

Position and Adoption Speed Justification: Organizations that are focused on a single overarching strategic priority (such as digital transformation) tend to establish a transformation office first, which, if successful, often ends up transitioning or refocusing efforts into a strategy realization office. Organizations that have a number of changing strategic priorities or a large number of diverse business units or divisions will find value in implementing an SRO function.

The high failure rate on realizing the outcomes of planned strategic initiatives (between 50% to 70%) means that a renewed focus on successful strategy execution or realization becomes essential for such initiatives. Strategy realization in the digital business is all about delivering the capability of creating "different and better" outcomes or value repeatedly. However, many leaders find it hard to identify what activities actually contribute to successful strategy execution, slowing uptake. In today's global environment, adoption grows slowly, thus the position is unmoved on the Hype Cycle this year.

User Advice: Successful strategy execution requires mature practices such as collaborative and value centered business cases, meaningful portfolio analytics, and clear agreement on strategy execution tactics. These techniques require a significant level of collaboration between various roles in the organization. The SRO must work their way toward the full mandate of the SRO as the organization gains experience in making better investment choices. This will help in balance the variety of portfolios that exist across the enterprise (see "3 Steps to Managing Distributed Portfolios in an Increasingly Digital World").

The SRO is also responsible for change enablement, communication and programmatic oversight. Change enablement is designed to move beyond a philosophy of one-and-done changes implemented as part of a project or program, to a more open-ended perspective on change as a continuous process of refinement. This may include ongoing cultural change that is driven from continuous delivery within the digital business.

In addition, continuous engagement, collaboration and communication about strategy is another key SRO responsibility. The SRO disseminates strategic direction, and provides feedback the organization (see "Harness the Strategy Realization Office to Fight Organizational Change Fatigue").

Also, the SRO ensures the organization's focus on strategy and that decision making reduces distraction of competing priorities that move away from strategic goals.

The final responsibility of the SRO is programmatic oversight, coaching and training program managers. Mature organizations utilize adaptive program management for strategy execution. Oversight is provided for cross product or portfolio dependencies to prevent the various workstreams (products, services, projects) across the enterprise from getting off track — or worse, ending up on a collision course.

Business Impact: Organizations evolving to enterprise digital business mindset of "continuous value," or value optimized operating models, will find an SRO a very helpful construct. The SRO will be able to pay for itself by reducing money spent on strategic initiatives that fail to yield value.

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: Cascade; Cora Systems; i-nexus; StrategyDotZero; UMT360

Recommended Reading: "Leveraging the Strategy Realization Office to Execute the Digital Strategy"

"Market Guide for Strategy Execution Management Software"

"Four EPMO Styles Are Evolving From Visibility to Transformation"

"Scaling Digital Business Requires an Enterprise Operating Model Perspective"

Customer Journey Analytics

Analysis By: Jason Daigler; Lizzy Foo Kune

Definition: Customer journey analytics (CJA) is the process to track and analyze the way customers and prospects use a combination of available channels to interact with an organization over time. It covers all channels the customer has used, including those with human interaction (such as a call center), those that are fully automated (a website), those that provide assisted help to the customer (live chat and co-browsing), those that are operated in physical locations (a retail store) and those with a limited two-way interaction (advertising).

Position and Adoption Speed Justification: Customer journey analytics is a strategic priority for a variety of internal roles in several different industries, as application leaders and marketing leaders strive to gain a better understanding of customer acquisition, retention, satisfaction, advocacy and loyalty. In many cases, CJA initiatives begin as projects to create customer journey maps, which are snapshots of customer experiences for a given process. Often, organizations begin by manually mapping their perception of the customer journey without using data and analytics to track and measure journeys. For journey maps to become both more accurate and dynamic, organizations will

ultimately need to power the journey maps with actual data. Without a clear strategy for capturing and linking the right data in each channel, organizations will lack a true understanding of the customer journey, beyond interactions wherein the customer is forced to reveal their identity.

CJA is accelerating in adoption as more applications begin to add elements of journey analysis into existing tools, such as customer data platforms, personalization engines, customer analytics applications, and multichannel marketing hubs.

User Advice: Customers hop from channel to channel over time, and as such organizations should not assume that continual investment in understanding customer behavior within a single channel will deliver more valuable insights than understanding the combination of channels they use. Similarly, organizations should be wary of key performance indicators (KPIs) that fail to consider the implications of customer activities in other channels, such as single-channel conversion rates. Starting with customer identification and journey mapping across only two to three channels, where data is both available and valuable, is an excellent way to start with CJA. The selected journey should also be one that is valuable to both the organization and the customer. Similarly, starting by manually mapping the internal perception of customer journeys is a reasonable starting point, as long as organizations intend to eventually validate the mapped journey with data and analytics. Organizations should also consider how they can orchestrate and automate journeys based on the insight gained from CJA; this will necessitate integrating CJA solutions, and specifically their outputs, into other internal systems.

As stated above, journey analysis functionality is becoming more frequently embedded into other systems, so organizations should evaluate their existing technology stack to see if they're already paying for an application with journey analysis capabilities.

Business Impact: Organizations can obtain the following benefits from CJA:

- Higher customer satisfaction from more seamless and personalized interactions across channels.

- Better understanding of the benefits that each interaction delivers to the overall journey, resulting in better allocation of investment to supporting the overall relationship.

- Improved understanding of the interrelationships between different parts of the journey, allowing organizations to, for example, evaluate the expectations that are set in the beginning of a journey with the outcomes toward the end of a journey.

- The ability to diagnose pain points in the customer journey across channels to aid business prioritization of CX projects.

- More accurate customer segments, based on data from multiple channels as well as real-time data and predictive modeling, thereby increasing the effectiveness of marketing campaigns.

- More successful personalization tactics — whether on commerce sites, communication channels or elsewhere in the customer experience — based on data that gives a more complete view of the customer's activity in multiple channels instead of a single channel.

- More relevant and efficient customer service for customer-facing agents who have a more complete view of the customer's activities and difficulties, based on data from multiple channels.

- More effective marketing, allowing media channels to be an extension of customer communications.

- Improved customer experience and reduced customer churn through real-time next best actions orchestrated by insight gleaned from customer activity.

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: Adobe; BryterCX; Cerebri AI; Kitewheel; Salesforce; Splunk; Teradata; Thunderhead; Usermind; [24]7.ai

Recommended Reading: "How to Run a Do-It-Yourself Customer Journey Mapping Workshop"

"Market Guide for Customer Journey Analytics"

"Technology Insight for Marketing Analytics"

Digital Ethics

Analysis By: Jim Hare; Frank Buytendijk; Lydia Clougherty Jones

Definition: Digital ethics comprise the systems of values and moral principles for the conduct of electronic interactions among people, organizations and things.

Position and Adoption Speed Justification: Digital ethics remains at the Peak of Inflated Expectations. Digital ethics and privacy remain growing concerns for individuals, organizations and governments. Consumers are increasingly aware that their personal information is valuable, and they're frustrated by lack of transparency and continuing misuses and breaches. Organizations increasingly recognize the risks involved in securing and managing personal data, and governments are implementing strict legislation in this area.

The coronavirus outbreak has demonstrated the important role of digital ethics in how governments and healthcare organizations are using technology and personal data to address the pandemic. However, no matter how urgent the response to the crisis is, decisions about how technology and data are used could result in more harm than good if those decisions are not grounded in digital ethics. The pandemic has shown that regardless of the hype around digital ethics, many organizations are still not applying them. And, as a result, the innovation hasn't yet passed the Peak of Inflated Expectations.

Board members and other executives are sharing their concerns about the unintended consequences that the innovative use of technology can have. There is frequent, high-profile press

coverage of stories that concern the impact of data and technology on business and society more broadly. More universities across the globe are adding digital ethics courses including the University of Oxford and the University Melbourne that recently launched programs and centers to address ethical, policy and legal challenges posed by new technologies. Government commissions and industry consortiums are actively developing guidelines for ethical use of AI. See "How Forthcoming EU Legal Framework Will Affect Your AI Initiatives."

User Advice: Business value and digital ethics need not be in conflict. Intention is key. If the only goal is business performance, and ethics is seen only as a way of achieving this goal, this may lead to window dressing. However, if the goal is to be an ethical company, and this leads to better business performance, then this serves all parties, and society more broadly. It will only strengthen the organization, helping you to have an even greater positive influence in the future.

Business and IT leaders responsible for digital transformation in their organizations should:

- Identify specific digital ethics issues, and opportunities to turn awareness into action throughout the various business domains.

- Discuss ethical dilemmas from different points of moral reasoning, such as outcome determinative versus empathy-focused. Ensure that the ethical consequences have been accounted for and that you are comfortable defending the use of that technology, including unintended negative outcomes.

- Elevate the conversation by focusing on digital ethics as a source of business value, rather than simply focusing on compliance and risk. Link digital ethics to concrete business performance metrics.

Business Impact: There are ethical consequences that arise through the use of digital technology in every business domain. Digital ethics should be treated as a tangible business practice discipline rather than an academic discussion. It does not have to be at odds with optimizing business performance. In fact, ethical behavior can have business value in itself.

Areas of business impact include influencing innovation ideas, product development, customer engagement, corporate strategy and go-to-market.

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: Avanade; Hypergiant; IBM; Microsoft; Salesforce; SAP; SAS

Recommended Reading: "Data Ethics and COVID-19: Making the Right Decisions for Data Collection, Use and Sharing"

"Digital Ethics: What Every Executive Leader Should Know"

"Digital Ethics by Design: A Framework for Better Digital Business"

"Top 10 Strategic Technology Trends for 2020"

"The CIO's Guide to Digital Ethics: Leading Your Enterprise in a Digital Society"

"Data Ethics Enables Business Value"

"Use Privacy to Build Trust and Personalize Customer Experiences"

Business Agile

Analysis By: Lorri Callahan

Definition: Business agile is a discipline that will help shorten the time it takes to accomplish strategic goals. This discipline focuses on improved investment decision making, iterative and adaptive practices, frequent customer interactions and increased team effectiveness. With more technology decisions driven outside of IT to enable digital business transformation (see Note 3), it is necessary for organizations to become more agile in how they approach all types of work.

Position and Adoption Speed Justification: The word "agility" in the context of business agile implies both speed and adaptability. Any organization can move quickly — being adaptive and innovative is more elusive and implies balance, a lack of wasted motion, clarity and focused commitment to the desired outcome. Business agile takes discipline, and discipline requires a combination of knowledge and practice. It is focused on realizing business value in the shortest time possible in order to deliver to the expectations of the customer and the market on a real-time basis.

The position of business agile has moved forward on the Hype Cycle as interest in adopting enterprise agile frameworks has increased, fostering improved collaboration between IT and the business. We expect this trend to continue as organizations are accelerating their digital business transformations in response to the impacts of the pandemic and the advancement of agile project management.

User Advice: Business agile is an approach to achieving customer-centered collaborative results under conditions of uncertainty, and is not limited to IT and software development. Leverage specific techniques such as an agile mindset to help support the adoption of business agile (see "The 6-Principle Framework for Mastering a Business-Agile Mindset"). An agile mindset changes the culture for how decisions are made, how teams collaborate and how work gets done, to ensure realization of continuous customer value. This approach can be applied to the way project and product teams work together to deliver results.

Begin by providing general overviews to help orient everyone to the concepts and practices needed to adopt business agile and an agile mindset. Next, identify a pilot team of dedicated resources to address a specific scope of work, with limited amount of interdependencies, to reduce complexity and allow the team to focus on practice adoption. The pilot team will commit to the shortest possible deadline required to achieve a viable outcome, without burning out people and without disrupting day-to-day operations. Be sure to publicize the progress of the pilot team and the shift in

their behaviors as they implement agile practices and create opportunities for others to learn about the pilot through demos and pilot team metrics.

PPM leaders need to update the PMO's charter to offer agile services including a roadmap for adopting business agile, facilitation of training sessions about agile methods, and enablement of agile practice adoption across the business.

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

The greatest impediment to the adoption of business agile is breaking the bad habit of starting too many ill-defined projects simultaneously. Instituting prioritization and starting the right projects, at the right time, with the right skill set will always yield higher results. PPM leaders can deliver greater value by shifting into "enabler" roles such as a promoter that advocates for and supports enterprise change.

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Recommended Reading: "The 6-Principle Framework for Mastering a Business-Agile Mindset"

"Digital Business Transformation in Established Organizations: Ride the Third Wave of Enterprise Agility"

"PMOs Can Deliver Faster Results With Business Engagement in Agile"

"Predicts 2020: Evolving PPM for Digital Business at Scale"

"Evolving for Digital Business: 6 Key Roles for Today's PMO"

Business Ecosystems

Analysis By: Marcus Blosch

Definition: A business ecosystem is a dynamic network of entities (people, businesses and things) interacting with each other to create and exchange sustainable value for participants. A business ecosystem allows participants to work cooperatively and competitively to support new products, satisfy customer needs and innovate (see "5 Digital Ecosystem Types That Will Impact Every Enterprise").

Position and Adoption Speed Justification: The shift toward business ecosystems continues to be driven by digital business with leading organizations looking to the business ecosystem as a source of innovation and business opportunity. The drive to business ecosystems continues, often largely unnoticed or taken for granted — the increasing importance of global supply chains and customers, the rise in platform-based business models, the driving technologies of cloud and API marketplaces (see "Top 10 Strategic Technology Trends for 2020: A Gartner Trend Insight Report"). And now, a global pandemic making use of the highly interconnected nature of modern civilization.

CEOs and business leaders see the business ecosystem as a way to create innovative new business models by focusing on the customer and developing platform-based business models. Many of the most successful business models are based on the ecosystem, from Alibaba Group to Uber, and even a traditional organization such as GE is moving to develop its digital strategy based on the business ecosystem. Looking ahead there are opportunities for some in decentralized business ecosystems (see "Predicts 2020: Blockchain Business").

Many "digital dragons," companies such as Apple, Amazon, Tencent, Alibaba and others continue to build powerful ecosystem-based business models (see "Winning in a World of Digital Dragons"). These business models are based on highly adaptive, customer-centric platform-based ecosystems. No doubt, as the world returns to growth, many organizations will look to replicate the model and success of these digital dragons.

User Advice: The global pandemic will lead to a recession. At this stage it is hard to predict what form that will take, however organizations will be looking for new opportunities to cut costs, increase productivity and drive growth through new business models. Business ecosystems offer a perspective on how that can be done:

- Consider ecosystem-based business models — learn about digital dragons, and how they have leveraged the business ecosystem and platform-based architectures (see "Winning in a World of Digital Dragons").

- Model your business ecosystem — gain a better understanding of the dynamics of your business ecosystem, its risks and its opportunities (see "Eight Ways Ecosystems Supercharge Business Models").

- Look for ways that technology can innovate your business model to leverage business ecosystems (see "Top 10 Strategic Technology Trends for 2020: A Gartner Trend Insight Report").

Business Impact: Business ecosystems are set to become a major source of opportunity and innovation for all organizations. Those organizations that can leverage the customers, information and capabilities available to them in the business ecosystem can create new business models far faster than would be possible with traditional approaches. The use of information and analysis to provide insight and create entirely new services will depend on organizations leveraging the business ecosystem.

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Recommended Reading: "Eight Ways Ecosystems Supercharge Business Models"

"5 Digital Ecosystem Types That Will Impact Every Enterprise"

"Winning in a World of Digital Dragons"

"Top 10 Strategic Technology Trends for 2020: A Gartner Trend Insight Report"

Digital Business Technology Platform

Analysis By: Bill Swanton

Definition: A digital business technology platform is the combination of technologies that enables an organization to deliver digital business capabilities. It enables existing platforms for IT, customer engagement, data and analytics, ecosystem partners and the Internet of Things to sense business events, decide what to do, and implement a business response that creates value for those involved. Platforms share assets such as data, algorithms and transactions with business ecosystems to match, create and exchange services.

Position and Adoption Speed Justification: Companies use a variety of relatively new-to-market integration, API mediation, platform as a service (PaaS) and other cloud technologies to implement digital business technology platforms today (see "Survey Analysis: Building a Digital Business Technology Platform Requires New Technologies and Methods"). There is currently no specific market or vendor for an entire platform — companies need to assemble components and tools from generally available cloud frameworks and a cluttered market of Internet of Things (IoT) vendors. Some service providers are marketing their platforms, which are reusable assets inevitably sold in conjunction with significant services. While digital native organizations are adept at these technologies, traditional companies often struggle with new architectural approaches, such as microservices architecture, event-driven architecture, and programmable infrastructure that may be required for large-scale implementations. Complicating matters is the rapid change in these technology markets, which may cause ongoing refactoring of the platform.

Despite these challenges, we believe digital business technology platforms are moving rapidly to the Plateau of Productivity in two to five years because:

■ Organizations are being driven to digital business to mitigate disruption of their core businesses and the distancing rules of COVID-19.

■ Digital business technology platforms enable platform business models, which can create rapid market growth and potentially dominate industries (see "Winning in the Platform Game, Part 1: Understand the Game and Determine Your Role").

■ Regulatory requirements in some regions are requiring organizations to share business services through digital platforms. For example, PSD2 requires banks in the European Union to provide mandatory access to customer accounts for regulated third parties.

User Advice:

▪ Work with business leaders to identify likely use cases (sense, decide, act) needed to implement your digital business based on the strategy (see "Use Gartner's Digital Business Layers to Communicate Your Digital Intent").

▪ Build out the digital business technology platform as needed to implement the initial digital use cases. The build out will take years and may require refactoring as the business scales and the technologies used mature. Given the limits most companies face on investment, the initial investment must be relatively small, with costs scaling with revenue, which precludes major upfront infrastructure and license costs (see "How to Build a Digital Business Technology Platform"). Treat the digital business technology platform as a continuously evolving product guided through its long life cycle by a product manager.

▪ Work with technology and service providers to determine what digital technologies are needed to implement the use cases in a way that will scale to the level the strategy envisions. Most organizations do not yet have the skills to implement this technology so skills transfer needs to be a part of any service contract.

▪ Understand what APIs you might need to consume or provide to interact with customers and/or ecosystem partners inside or outside of the enterprise.

▪ Keep existing platforms loosely coupled by using techniques such as API mediation so you can modernize those platforms without disrupting your digital business build-out. Managing an inherently hybrid IT infrastructure for all these parts will be a major challenge.

Business Impact: DBTP enables an enterprise to become a digital business and deliver digital products and services to customers. Without it, it will be much harder for an enterprise to gain the business benefits of digital business. They empower people, businesses and things to give, take or multiply value creation for the enterprise. Digital platforms will make it easier for new market entrants, startups, competitors and, eventually, smart machines to create and pursue new business opportunities. Traditional businesses will have to build a digital business technology platform to compete and/or participate in these new markets. DBTPs provide an easier "funding/investment" target for business leaders to incorporate.

Benefit Rating: Transformational

Market Penetration: 20% to 50% of target audience

Maturity: Adolescent

Sample Vendors: Amazon Web Services; Google Cloud Platform; Microsoft Azure; NXN; Red Hat OpenShift xPaaS; VANTIQ; VMware

Recommended Reading: "How to Build a Digital Business Technology Platform"

"Use Gartner's Digital Business Layers to Communicate Your Digital Intent"

"Survey Analysis: Building a Digital Business Technology Platform Requires New Technologies and Methods"

"How to Govern a Digital Business Technology Platform"

Human-Centered Design

Analysis By: Marcus Blosch

Definition: Human-centered design puts people at the center of the design process. It uses ethnographic approaches, such as design thinking, to gain deeper insight into people, their behavior and needs, and designs the services that people need and value. The design process is iterative and inclusive, allowing people to shape the design to more closely suit their needs.

Position and Adoption Speed Justification: The global pandemic is affecting organizations worldwide, with the likely outcome of a global recession to follow (see "Forecast Analysis: Global Recession Scenario"). Innovation will remain top priority for organizations as a way to survive and exit a recession. This will be done by driving productivity and effectiveness, and creating new business models, services and experiences for their customers (see "2020 CIO Agenda: Global Perspectives on Winning in the Turns").

The focus on the customer is the starting point for this innovation. In our recent survey, 83% of organizations were using design thinking to develop new business models (see "How Leading Organizations Create Innovative Business Models"). The increasing popularity of product management and agile development to support continuous innovation have led to the increased use of human-centered design approaches and, in particular, design thinking (see "Enterprise Architects Combine Design Thinking, Lean Startup and Agile to Drive Digital Innovation").

However, despite the interest and wider use of approaches such as design thinking, human-centered design is a new approach for many organizations, and will require building the people, competencies and experience needed.

User Advice: Organizations new to human-centered design must take time to learn the approach and gain experience. Most likely teams involved closely in digital innovation or transformation will be a priority to train and develop.

Begin by getting training in a human-centered design approach such as design thinking or lean startup. It may make sense to partner with an external design firm to provide extra design resources. Tailor the approach to suit the particular needs and realities of your organization.

Start small and grow, begin in "safe to fail" areas where you can apply human-centered design, and allow your teams to gain experience. Over time, extend human-centered design to those initiatives and projects most suited to it.

Business Impact: The advantage of human-centered design is that by focusing on the customer it shrinks the time between inception of an idea and delivery of a working product or service to customers. A continuous feedback loop with customers ensures that development of new products or services is closely aligned with their expectations. It also helps to prevent bloating a product or service with features that were thought to have value at the ideation stage. Internal IT and product marketing will enjoy quicker responses to rapidly changing market trends and competitor moves,

faster time to market with ideas, less cost to experiment (fail fast and fail inexpensively), and fewer resources spent on "perfecting things."

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Sample Vendors: IDEO; Odopod; Work & Co

Recommended Reading: "How Leading Organizations Create Innovative Business Models"

"Enterprise Architects Combine Design Thinking, Lean Startup and Agile to Drive Digital Innovation"

"Toolkit: Design Thinking"

Sliding Into the Trough

A Digital Business

Analysis By: Jorge Lopez

Definition: A "digital business" is an organization or unit inside an organization in which a product set and business model are only made possible by the use of information and digital technology.

Position and Adoption Speed Justification: The dominant discussion about digital business has changed to transformational or more incremental change (such as optimization). What remains unchanging into 2020 is the conviction of board directors and CEOs that they must act in response to significant and disruptive industry change. Of board directors globally, 83% say digital technology will lead to substantial or complete industry transformation, according to the 2020 Gartner survey, View From The Board of Directors. In contrast, the same survey shows that boards judge their own efforts as tepid, with respondents, on average, saying their digital strategies are not well developed and that they struggle with the overall ROI of their digital transformation efforts. This tension between what the leadership of most organizations believe will happen, and what those same corporations are reporting on current results, indicates a strain between the vision of digital business and the reality of implementation. The message received by corporate boards is "keep working on disrupting the industry to ensure we don't get disrupted ourselves."

In addition to these observations from primary research data, we also are seeing that industry examples we have been watching for three or more years are now making their vision into a reality. Examples include the move by Apple into healthcare by medically certifying the Apple Watch to detect heart abnormalities such as arrhythmia. BHP's vision to build "the fully autonomous mine" is now being realized with connected efforts by partners such as Caterpillar. Amazon, who focused on its promise to deliver in an hour, changed its business to enter supply chain/logistics and is not the No. 1 provider in the world. The U.S. Air Force has now successfully tested the technology and vehicles for its ambitious "Loyal Wingman" program, where an F-35 fighter jet is helping guide a swarm of newly deployed autonomous jet drones.

As industry after industry pursues its ambition and observes the fate of segments of each industry in the wake of COVID-19, we will see the rise of technology and services providers offering ways to design and execute on digital business. The risks, at first, will be high, as untested technologies and methodologies are put into practice. It will be important to ensure a consistent view of digital business, and for that we recommend reading "Four Definitions Make A Strategy Planning Process More Effective."

User Advice: Leading organizations' CIOs and digital business executives should:

- Study how leading corporations are building out their visions for the future of their industry, especially in the wake of the global pandemic. Look at what Toyota, with its Woven City, Amazon, in supply chain/logistics, BHP in autonomous mining, Caterpillar in autonomous systems and Honda with its SAFE SWARM are doing. This will be highly instructive to the sort of dedication and execution required to make a reality out of business

- Lay out plans that take your business through the economic downturn caused by the global pandemic. Digital business becomes a necessity in removing the friction of how a business works and, thus, gains higher priority.

- Resist the temptation to make your case about technology. Focus on what it will take to disrupt your industry. What new capabilities or business models will shift the industry in your favor? Let the technologies be chosen based on the guidance of the use cases that drive value. For example, financial services wealth management is working hard to co-opt roboadvisors so as to keep out new entrants. This act of self-defense is also driving down their own expectations for profit, which will mean their business model will be different in the next 36 months.

- Ensure you make transformation a priority in a small part of your business, while optimizing the rest, when analyzing your business portfolio to make changes. Do this until the approach to transformation is better understood internally.

Business Impact: The opportunity in digital business is the ability to:

- Shape the future of an industry as well as your role within it (Apple in healthcare, BHP in mining, Toyota and its Woven City).

- Create new industries (Google in search and translate, Amazon in supply chain and logistics with 60-minute fulfillment of orders).

- Capture adjacent industries (Caterpillar and autonomous systems for mining, Amazon and pharmacy with PillPak).

In each case, the successful capture of the industry-disrupting goal takes the winner to new heights in industry business performance. We expect to see failed attempts to translate the promise of digital business into business performance, but not among the winners in each industry, where we expect industry-leading performance over the next ten years.

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Recommended Reading: "Executive Leadership: Digital Business Transformation Primer for 2020"

"Toolkit: Strategic Industry Maps of AI Use Cases"

Agile Project Management

Analysis By: Robert Handler

Definition: Agile project management is a style of project management designed for continuous connected activities in environments with higher degrees of uncertainty and change. Conventional project management uses on-time and on-budget delivery against an initial plan as a primary determinant of success. Agile project management focuses on constant incremental value delivery through dedicated teams, embracing success metrics provided via customer feedback.

Position and Adoption Speed Justification: Agile software development is now mainstream. In our 2019 Agile in the Enterprise Survey, conducted online in June 2019 with 130 participants, 63% used or planned to use agile on the business side. Agile concepts are also gaining acceptance outside of software development, and as valid and useful constructs within project management offices (PMOs). Agile projects generally deliver faster business outcomes and foster better partnerships between teams and stakeholders. The pandemic forced many business leaders to pivot, leading many to believe they are suddenly agile. We believe the residual effects from this global incident will accelerate agile project management into the Plateau of Productivity within five years.

User Advice: Organizations must adopt an approach to project management that enables agility. Agile project management, if applied appropriately, provides an effective approach to address changing requirements and environmental uncertainty.

Organizations must gauge their current rate of change and need for speed, and develop a plan to evolve agile project management beyond software delivery projects. Agile project management is not the singular approach for managing all projects — just those with requirements changing throughout the project life cycle.

When incorporating agile project management, adjust processes and evolve ways of getting work done. For example, epics and user stories will likely replace lengthy requirements documents. Also, work will be prioritized based on value and size as opposed to following a rigid plan. However, when certain activities must occur in a certain order, this must be provided through constructs such as minimum viable product (MVP) and roadmaps.

When incorporating agile project management, evolve agile project dashboard metrics to focus on "business outcomes" and customer satisfaction instead of on-time/on-budget.

Business Impact: Today, organizations must rapidly and effectively respond to change because of the increased complexity and quicker pace of change inherent in a more connected world. Agile project management is relevant to virtually all organizations and most areas within these organizations. Agile project management is required to enable effective innovation and business

transformation to allow both to be change aware. To succeed, organizations must dedicate resources, closely engage with customers, and act on customer feedback.

Benefit Rating: Transformational

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Sample Vendors: Atlassian; Broadcom (CA Technologies); CollabNet VersionOne

Recommended Reading: "Adopting Agile? Do What Successful Agile Teams Do"

"Market Guide for Adaptive Project Management and Reporting"

"The 6-Principle Framework for Mastering a Business-Agile Mindset"

Business Capability Modeling

Analysis By: Saul Brand

Definition: Business capability modeling (BCM) is a technique that represents the ways in which enterprises combine resources, competencies, information, technology, processes and their environments to create unique competitive possibilities and deliver value to customers or citizens.

Position and Adoption Speed Justification: Business capabilities intersect the enterprise business and operating models. Enterprise architecture (EA) and technology innovation (TI) leaders must stimulate, contribute toward and facilitate conversations with business and IT leaders about the impact of new and emerging technologies on the enterprise's business and operating models. They can do this by focusing on businesses' capabilities and their ability to create, capture and deliver value.

BCM is one of the tools and techniques EA and TI leaders use to help business and IT leaders see the common view of the business. It is a discipline, tool and technique that helps business leaders visualize which resources need to be combined to execute and operationalize the business strategy. By applying digital business concepts to business capabilities, EA and TI leaders can help business leaders explore potential ways to enhance or develop their capabilities, unlocking and executing new business opportunities. BCM can be used to flesh out and operationalize the organization's business strategy, communicate the business strategy, and demonstrate how people, process and technology resources need to change to achieve targeted business outcomes.

Between April 2019 and April 2020, Gartner has engaged with more than 442 clients inquiries, one-on-ones, and workshops on leveraging business capability modeling as the common platform to inform and drive decision making between business and IT executives.

We conducted a pre-event survey in August 2019 of potential client and nonclient attendees from North America and Europe ahead of Gartner's 2020 EA Summits in Orlando, Florida, and London, U.K. The total number of respondents was 486. We asked this question: "How important is it for you

to leave the event with insights into business capability modeling?" We found that 87% of EA practitioners are interested in learning about linking EA to business and IT strategy, and that 73% of EA practitioners are interested in learning about business capability modeling. These statistics show a significant year-on-year change. Specifically, those interested in learning about business capability modeling has more than doubled.

We believe there is still significant hype around business capability because enterprise architects — and IT in general — are looking for tools and techniques that will help to strategically engage and drive more value when working with their business counterparts. However, we believe that interest in business capability modeling is greater than its adoption. Therefore, we put the market penetration in the range of 10% to 30%, with the view that the current overall market penetration is about 20%. For this reason, we position the business capability profile as just beyond the Peak of Inflated Expectations.

User Advice: To create a high-impact, business-outcome-driven EA practice, it is essential that EA practitioners create strategically focused anchor models, typically, a future-state BCM. EA practitioners must also consider leveraging and mashing up BCMs with other key business architecture deliverables, such as value-stream, business process, ecosystem, customer maps and other operating and functional models. Once used to represent a future-state business and operating model, business capabilities can be used as a platform for creating both diagnostic and action-oriented deliverables. Deeper, detailed BCMs may be used to illustrate specific decisions in information, business, solutions and technology architecture viewpoints.

Business Impact: BCM has the highest business impact when it is used to identify and assess technology options and value creation opportunities. These can be used to craft a compelling, high-level set of capabilities and business trade-offs that are immediately relevant to business and IT leaders. This approach focuses and links IT efforts to business direction and strategy, as well as targeted business outcomes, programs, projects, products and initiatives. It decreases the likelihood that business and IT leaders will get bogged down in political, organizational and technical quagmires.

The benefit of BCM is rated high because it enables business and IT strategic planners to engage in business strategies and execution planning, and to understand the impact of these decisions on business and IT. This is especially important as organizations push deeper into digital transformation and optimization initiatives that focus on customer-centricity and value streams.

The value of BCM is, first and foremost, to focus on and explore future-state business and IT direction and plans. It can also be used to help focus and illustrate investment decisions. These decisions can then be linked to information, solutions, technical, application and security and other architectural changes. Another, equally important benefit is to enable EA practitioners to have objective discussions about how to achieve future-state business capabilities without drilling down into technology, people, process and information details. Drilling down into details too early can derail discussions about business direction and strategy, as well as about organizational optimization.

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Early mainstream

Sample Vendors: Avolution; BiZZdesign; BOC Group; LeanIX; Orbus Software; QualiWare

Recommended Reading: "Toolkit: Construct Business Architecture Deliverables That Deliver Value to Business Leaders"

"Toolkit: Business Outcome Statements Deliver Value to Your Business and Guidance for EA"

"8 Best Practices for Creating High-Impact Business Capability Models"

"Toolkit: Workshop for Constructing an Initial Business Capability Model"

"Toolkit: How to Use Pace Layering With Business Capability Modeling to Prioritize Investment Decisions"

"Compendium of Business Capability Models"

"The Architect's Business Capabilities Handbook"

"Sample Business Capability Model"

"Toolkit: How to Develop a One-Page Business Strategy"

"Create Roadmaps That Support Decision Making and Communicate Strategy Effectively"

"Stage Planning a Business-Outcome-Driven Enterprise Architecture"

Machine Learning

Analysis By: Pieter den Hamer; Carlie Idoine; Shubhangi Vashisth

Definition: Machine learning is an AI discipline that solves business problems by utilizing mathematical models to extract knowledge and patterns from data. There are three major approaches that relate to the types of observation provided: supervised learning, where observations contain input/output pairs (also known as "labeled data"); unsupervised learning (where labels are omitted); and reinforcement learning (where evaluations are given of how good or bad a situation is).

Position and Adoption Speed Justification: Machine learning is still a popular concept, given its extensive range of impacts on business. The triggers of its massive growth and adoption have been growing volumes of data, advancements in compute infrastructure and the complexities that conventional engineering approaches are unable to handle. As organizations continue to adopt these technologies, we recently see focus on aspects that relate to ML explainability and operationalization. Augmentation and automation (of parts) of the ML development process improve productivity of data scientists and enable citizen data scientists in making ML pervasive across the

enterprise. In addition, pretrained ML models are increasingly available through cloud service APIs, often focused on specific domains or industries. New frontiers are being explored in synthetic data, new algorithms (e.g., deep learning variations) and new types of learning. These include federated/ collaborative, generative adversarial, transfer, adaptive and self-supervised learning, all aiming to broaden ML adoption.

User Advice: For data and analytics leaders:

- Focus on the business problem. Start with simple business problems for which there is consensus about the expected outcomes, and gradually move toward complex business scenarios.

- Assemble a (virtual) team that prioritizes machine learning use cases, and establish a governance process to progress the most valuable use cases through to production.

- Utilize packaged applications, if you find one that suits your use case requirements. These often can provide superb cost-time-risk trade-offs and significantly lower the skills barrier.

- Nurture the required talent for machine learning. Partner with universities and thought leaders to keep up to date with the rapid pace of advances in data science. Create an environment conducive to continuous education, and set explicit expectations that this is a learning process and mistakes will be made.

- Provide guidelines and monitor compliance with respect to security, privacy, bias and explainability.

- Leverage the augmentation and automation of ML activities, avoiding unnecessary low level coding and alleviating labor intensive tasks for expert data scientists, while making ML accessible for citizen data scientists.

- Explicitly manage "MLops" for deploying, integrating and monitoring ML models, not underestimating time and complexity. To be successful, early involvement is required of both business stakeholders and IT for integration and operations.

- Focus on data as the fuel for machine learning by adjusting your data management and information governance strategies to enable your ML team. Data is your unique competitive differentiator and adequate data quality, such as the representativeness of historical data for current market conditions, is critical for the success of ML.

Business Impact: Machine learning drives improvements and new solutions to business problems across a vast array of business, consumer and social scenarios:

- Automation

- Drug research

- Customer engagement

- Supply chain optimization

- Predictive maintenance

- Operational effectiveness

- Workforce effectiveness

- Fraud detection

- Resource optimization

Machine learning impacts can be explicit or implicit. Explicit impacts result from machine learning initiatives. Implicit impacts result from products and solutions that you use without realizing they contain machine learning.

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: Alteryx; Databricks; Dataiku; DataRobot; H2O.ai; IBM; MathWorks; Microsoft; SAS; TIBCO Software

Recommended Reading: "Magic Quadrant for Data Science and Machine Learning Platforms"

"Critical Capabilities for Data Science and Machine Learning Platforms"

"Toolkit: RFP for Data Science and Machine Learning Platforms"

"3 Types of Machine Learning for the Enterprise"

"Top Organizational Pitfalls of Machine Learning Initiatives"

Continuous Delivery

Analysis By: Hassan Ennaciri

Definition: Continuous delivery (CD) is an approach that enables DevOps teams to create an automated pipeline for producing software in short cycles. CD ensures that software can be reliably released any time via a DevOps toolchain and is a key capability of a DevOps initiative.

Position and Adoption Speed Justification: Growing DevOps initiative success continues to drive enterprise investments in CD capabilities. CD improves release velocity and reliability while simplifying compliance enforcement via automation. Continuous integration (CI), automation and testing are core to CD. These functions provide environment models that can be leveraged throughout the software development life cycle (SDLC) to more consistently deploy application builds and updates.

CD is a nonprescriptive, evolving approach that DevOps teams can deliver and realize in many ways. Given the emerging state of CD, market demand and vendor responses have been fragmented. DevOps teams typically start by automating functions that can clearly demonstrate the

value of CD (e.g., application deployment and release configuration) when integrated with CI and testing. As a logical linkage between CI and operational functions, CD plays a critical role in building scalable DevOps toolchains.

User Advice: DevOps teams should incorporate CD processes to help reduce friction throughout the SDLC. They must also evaluate and invest in associated tooling, such as application release orchestration tools, containers and continuous configuration automation tools. These tools provide some degree of environment modeling and management, which can prove invaluable for scaling CD capabilities across multiple applications.

When starting a CD initiative, enterprises must consider all associated technologies and take an interactive approach to adoption. This will require collaboration with all stakeholders from product, development, security and operations. To enable a higher likelihood of CD success, DevOps teams must also establish consistency across application environments and implement a continuous improvement process that relies on proficiency metrics. DevOps product teams should assume that there will be continual discoveries about roles and responsibilities, required skills, automation details and documentation, especially during the early phases of adoption. DevOps teams should build requirements for CD tools with a broader view than just one environment (development, test, quality assurance, preproduction or production) and one application (for example, Java and .NET). The primary application of CD is to extend CI processes, but organizations also need to consider applying CD principles to infrastructure automation.

Business Impact: CD is a key capability of a DevOps initiative that reduces build-to-production cycle time. This accelerates the positive impact of new applications, functions, features and fixes by increasing velocity across the application life cycle. The positive impacts include improved business delivery and end-user satisfaction, improved business performance and agility, and risk mitigation via rapid delivery of updates.

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Adolescent

Sample Vendors: Broadcom; Chef; CloudBees; GitLab; Harness; IBM; Microsoft; Puppet

Recommended Reading: "How to Build and Evolve Your DevOps Toolchains"

"The Future of DevOps Toolchains Will Involve Maximizing Flow in IT Value Streams"

"Magic Quadrant for Application Release Orchestration"

"Critical Capabilities for Application Release Orchestration"

Digital Business Transformation

Analysis By: Jorge Lopez; Kristin Moyer; Don Scheibenreif

Definition: Digital business transformation is the process of exploiting digital technologies and supporting capabilities to create a new, competitively robust digital business model.

Position and Adoption Speed Justification: Surveys of board directors and CEOs show that digital business remains a very high priority now. Digital business may include the adoption of new business and operating models and lead to business transformation (see "Four Definitions Make a Digital Business Strategy Process More Effective"). It stands in contrast to digital optimization, which is studied separately. The onset of a global pandemic in the first quarter of 2020 has, in a manner different from digital business and digital transformation, caused disruptions. These attacked expected revenue, excess costs and also narrowed the corporate mission in most cases. While in cases such as Amazon, the pandemic has actually driven revenue up. This has also been disruptive by causing major supply chain players like Amazon and Walmart to shift and grow resources and hiring to meet crisis needs.

As board directors turn to evaluate their own efforts on digital transformation, it is their conclusion that digital strategies are not yet well developed. They have also concluded that no major revisions to strategy instructions for the leadership team are in place, and they struggle seeing a return on investment on digital business (see "Toolkit: Presentation for Key Findings From the 2020 Board of Directors Survey").

As more regulations are changed in response to the global pandemic, it further accelerates the finding from the 2020 Gartner Board of Directors Survey that companies are planning to push regulatory boundaries to get to digital transformation. Expect aggressive thrusts to expand business boundaries even with the constraints introduced by the pandemic.

User Advice: CIOs leading innovation and strategic change can impact organization digital business transformation in the following ways:

- In the face of the global pandemic, as hard as it may be, start to think about, and plan for, the opportunity to capture new space as the situation goes from economic crisis to economic growth.

- Help your organization define its digital ambition at the executive level. Digital ambition is a clearly identified, desired digital outcome of a digital business strategy — shaped by a digital industry vision and an enterprise's response to that vision.

- Ensure that the organization understands the difference between digital optimization and digital business transformation, so a misunderstanding of these terms does not cause corporate executives to commit to a less ambitious strategy than the enterprise needs. Executives often believe they are pursuing digital business when they are really engaged in digital optimization.

- Recognize that digital business transformation requires business model change, and the value proposition is the foundation of a business model. Help the organization analyze dependencies across strategy, business models and operating models.

- Evaluate technology and service providers, in part, on the accurate use of the digital business transformation term. Misuse indicates a lack of understanding of digital business or an attempt

to make conventional offerings sound more exciting. A common understanding of terms with vendors will help put initiatives and expectations in their proper context.

Business Impact: Digital business transformation is creating new industries and destroying old ones. This will happen if a competitor masters a significantly more efficient way of supplying a product and you are no longer competitive. It is changing the basis of competition in industry after industry. Not every organization needs to be the organization that is disrupting its industry. But every organization does need to have a strategy for how to deal with the realities of digital business transformation and how to create value in new ways.

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Early mainstream

Recommended Reading: "Four Definitions Make a Digital Business Strategy Process More Effective"

"4 Starting Points for Digital Business Transformation"

"How to Design Digital Business Transformation"

Digital Twin

Analysis By: Alfonso Velosa; Benoit Lheureux; Marc Halpern

Definition: A digital twin is a virtual representation of an entity such as an asset, person or process and is developed to support business objectives. The three types of digital twins are discrete, composite and organizational. Digital twin class elements include the model, rules, relations and data properties. Digital twin instance elements include the model, data, unique one-to-one association, and monitorability.

Position and Adoption Speed Justification: The idea of modelling people, physical assets, and processes continues to gain traction, especially as the architecture for the future of applications includes digital twins as features of an application, and as stand-alone supplements to portfolios of applications that address an entity:

- People: Digital twins are the evolution of trends including customer 360-degrees, patient electronic health records, and fitness monitors. Their near-term uses include health monitoring and employee safety, particularly in response to the pandemic.

- Physical assets: Digital twins adoption aligns to Internet of Things (IoT) trends. For owner/operators, near-term use includes lowering maintenance costs and increasing asset uptime for equipment users in factories, hospitals, utilities, etc. For product original equipment manufacturers (OEMs), near-term uses include product differentiation, business model differentiation through new product service models, and obtaining customer data.

- Processes: Digital twins are being developed to model IT organizations, financial exchanges, and processes such as purchase orders.

The digital twin profile has moved past the Peak of Inflated Expectations, based on enterprise confusion driven by conflicting vendor marketing and on challenges implementing digital twins. Gartner's CIO Survey 2020 shows that 6% of enterprises have implemented digital twins, although less than 1% of assets have digital twins. Another 41% of enterprises expect to deploy digital twins within three years. These trends lead us to shorten the time to plateau down to two to five years. In the next decade, digital twins will become the dominant design pattern for digital solutions.

User Advice: CIOs should work to guide and protect business adoption of digital twins:

- Business outcomes: Work with business leaders to establish clear business objectives for digital twins. In parallel, establish an IT vision for digital twins, to establish a coherent approach to support the business units.

- Technology: Start with models that are as simple as possible of the entities that are of interest for your business process, whether basic, such as the location of vehicles or a very high fidelity models of a human heart. Determine what data is necessary to "feed" the models and the types of analytics needed; a corollary here is the need to verify and drive data quality. Don't let the dearth of standards limit innovation. Assess how composite and organizational digital twins will require integration and custom development.

- Governance and accountability: Engage the business unit to identify champions, budget support, and to co-build the digital twin strategy and roadmap. Establish a joint business and IT governance process for digital twins, covering their alignment to business KPIs, short and long term value, and their updates and life cycle management.

- Digital ownership and ethics: Work with business and legal teams to establish a policy on ownership of the digital twin models and data, as well as who may participate. In parallel, establish a digital ethics policy to guide the organization to develop twins that positively support the enterprise while serving employees, customers or citizens. This policy will set guidelines to engage ecosystem stakeholders about what data may be shared and what monetization experiments to conduct.

- Vendors selection: Understand most technology providers are still developing their strategy and mostly offer enabling technology. A small number of technology providers have digital twin portfolios which align with specific vertical markets.

Business Impact: Digital twins are transformational as they enable business to drive new digital business models as well as update existing models. For example, they enable superior asset utilization, service optimization and improved customer experience. They create new ways to operate, such as consumption of physical outcomes instead of the capital expenditure acquisition of industrial assets, or new ways to drive an ecosystem or supply chains. And they will open new ways to monetize data.

Digital twins will challenge most enterprises to change their thinking of master data from an IT practice to one that engages the business units and IT to get a more comprehensive situational

awareness of assets, people, or processes. In addition, a digital twin can be expensive to maintain, and its value centers on remaining a live model, synchronized with the entity.

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Sample Vendors: AVEVA; Bentley Systems; C3.ai; Cognite; GE Digital; Mavim; Microsoft; QPR Software; Schneider Electric; ThoughtWire

Recommended Reading: "Market Guide for Digital Twin Portfolios and Enabling Technologies"

"Survey Analysis: IoT Digital Twin Adoption Proliferates Across Many Sourcing Options"

"Toolkit: Enterprise Readiness for Digital Twin Deployment"

"Market Trends: Software Providers Ramp Up to Serve the Emerging Digital Twin Market"

"Software Product Managers Should Exploit the Full Revenue Potential of Digital Twins"

Agile Architecture

Analysis By: Keith Mann

Definition: Agile architecture refers to architecture practices that embrace the principles and values of agile. It enables the continuous delivery of valuable software and helps align architects with agile application development and DevOps teams. It does not imply specific architecture models or reference architectures.

Position and Adoption Speed Justification: Many authors and architects responded to the rise of agile software development with corresponding approaches to architecture of all sorts. These responses varied widely, were inconsistent and failed to gain traction. Nevertheless, the need for an agile approach to architecture remained. More recently, enterprise agile frameworks such as the Scaled Agile Framework (SAFe), Disciplined Agile (DA) and Large Scale Scrum (LeSS) have included architecture practice guidance. This guidance has been simple, pragmatic and well-aligned with actual agile and DevOps practices. This has led to renewed enthusiasm in agile architecture and an uptick in its adoption. Thoroughly implementing these practices requires cultural and organizational changes, as well as significant changes to the way individual architects work. This change process will take time, and its full impact may not be felt long after the architecture practices themselves have been adopted. It will also place demands on architects and leaders, who will largely be on their own until agile coaches and transformation consultants gain the skills they need to assist.

User Advice: Architecture leaders whose agile and DevOps application organizations are adopting an enterprise agile framework should study and adapt the corresponding agile architecture practices. This should be an integral part of the organization's overall enterprise agile transformation strategy.

Those that are not using such a framework will need an agile architecture capability regardless. Enterprise agile frameworks can offer inspiration on how to develop such a capability, but beware of using framework practices in isolation as their effectiveness may depend on other elements of the framework. The Gartner research listed below is another source of practices. Enterprise architecture teams are often called upon to identify opportunities to shape agile adoption. In other cases, the input of an agile coach or transformation consultant familiar with appropriate agile architecture practices will be valuable.

Plan for a lengthy — even ongoing — period of transformation: The shift in skills, behaviors and ways of working that agile architecture demands will not happen quickly. Work closely with other leaders during this process because, while you will have to coordinate many aspects of your changes, their timing and nature will be hard to predict. Frequent adjustment, feedback and retrospection will be helpful.

Business Impact: All aspects of architecture are impacted by agile architecture, though enterprise architecture, application architecture and solution architecture are often the focus. All industries and all sizes of organizations are adopting agile, and the adoption of agile architecture will be correspondingly broad. Organizations that adopt agile architecture will benefit from an improved ability to continuously deliver solutions that are architecturally sound and that are aligned with their overall strategy. Architecture organizations that do not develop an agile architecture capability will likely be bypassed due to stakeholder needs to deliver regardless of the architecture implications. This will lead to significant and costly technical debt that will be difficult to eliminate, and will jeopardize the agile transformation.

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: Disciplined Agile Consortium; Scaled Agile; The LeSS Company

Recommended Reading: "Adapt Your Application Architecture Practices to Work Better With DevOps Teams"

"Use EA to Ensure Your Agile Development Succeeds"

"DevOps Organizations Must Define the Role of the Application Architect"

"Find Your True Meaning of 'Architecture' to Succeed With DevOps"

"From Fragile to Agile Software Architecture"

Business Architecture

Analysis By: Saul Brand

Definition: Business architecture (BA) refers to the enterprise architecture (EA) activities of creating deliverables that articulate and guide the business and operating model, people, process, and organizational change and investments in response to disruptive forces and toward targeted business outcomes.

Position and Adoption Speed Justification: BA is a mandatory part of EA. As a discipline, BA sits at the intersection of business and IT. It's the starting point of EA, linking IT efforts to business direction and strategy. BA addresses the "why" and "what," before executing the "how" of EA. It aligns business and IT and it provides critical guidance to integrate business strategic planning and execution. It defines the organization and its operations from a "business" perspective — for example, its business capabilities, ecosystem, processes, organizational model and cost model.

Organizations that support BA as an integral part of EA have a significantly higher ability to execute on their technology-enabled business strategy. That's because they have a clear understanding of the strategy and its impact on business and IT, and they have guidance to drive delivery. BA insight through key BA deliverables makes it possible to support digital innovation, transformation and optimization efforts by understanding where the organization must link business strategy to IT programs, projects and initiatives.

In August 2019, Gartner conducted a pre-event EA Summit survey of 486 potential client and nonclient attendees from North America and Europe ahead of Gartner's 2020 EA summit in Orlando, Florida, and London. We found that 87% of enterprise architects use BA to link their business and IT strategies. Between April 2019 and April 2020, our research team fielded 398 client inquiries and discussions covering BA at our EA Summit conferences and Gartner Symposium/ITxpo events. As such, BA is increasingly central to EA efforts. We contend that BA remains at the peak-trough midpoint.

User Advice:

- Position BA as a critical component of internal management consulting, helping to shape and define future-state business and operating models, identify opportunities and implications, and shape roadmaps and plans.

- Start BA work by understanding the business and operating model, identifying the business problem, opportunity or disruption to which critical stakeholders need answers.

- Identify approaches, such as lean startup and agile delivery; models, such as business ecosystems, business capabilities, value streams and customer journey maps; and competencies that support digital innovation.

- Determine the form of deliverables (e.g., business capabilities, value streams and business process models) that will resonate with stakeholders and help enable and deliver the BA and business outcomes needed.

- Work with key stakeholders in the organization — including strategic planners, the CIO, line-of-business (LOB) management and product owners — to identify how BA can support the strategy process. This will include clarifying business strategy and objectives; identifying

business outcomes; exploring implications, impacts and risks; and addressing stakeholder questions. Explore the use of tools, such as business strategy on a page.

- Create enabling, diagnostic and action-oriented BA deliverables focused on the target audience and its issues and opportunities. Look for opportunities to use high-level business and operating models (e.g., business capability and value chain), combined with or relating to business, people, information, technology and solutions.

Business Impact: Business leaders must understand the business and operating model levers that are susceptible to digitalization initiatives before executing their digital ambitions and strategy. Business leaders and strategists must adopt BA as a discipline and use its deliverables to make sound, technology-enabled investment decisions.

To effectively enable and manage digital business and operating model innovation, transformation and optimization, organizations must include BA as a primary input to EA. Focusing on supporting BA as part of an overall EA effort can help immediately in more effectively engaging the business, demonstrating business value, and integrating business and IT efforts. Developing BA capability brings an important internal management consultancy competency into the organization to support continuous innovation and operations. With the shift from project to product, organizations seek to become more innovative, agile and adaptive to quickly respond to customer demands and their rapidly changing and competitive business environments. BA is becoming a capability that is critical to the successful execution of a business strategy.

BA helps inform and guide a rigorous analysis of the business, its context, and the disruption and opportunities it faces. Business leaders gain a comprehensive and comprehensible way of making sound investment decisions by using BA to look at strategy, the business model and the supportive business operating model that underpins the organization. As such, business leaders need to permanently embed and use BA to enable and drive an adaptive business strategy.

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Mature mainstream

Sample Vendors: Accelare; Avolution; BiZZdesign; erwin; MEGA International; Software AG

Recommended Reading: "Toolkit: Construct Business Architecture Deliverables That Deliver Value to Business Leaders"

"A Detailed Examination of the Elements of the Business Architecture Landscape"

"How Leading Organizations Create Innovative Business Models"

"Tell Your Business Model Story With Simple Building Blocks"

"Better Digital Business by Design With the Business Architecture Landscape"

"Follow 5 Steps to Architect Your Enterprise Operating Model"

"Leadership Vision for 2020: Enterprise Architecture and Technology Innovation Leader"

"Enterprise Architecture Must Evolve Into an Internal Management Consultancy"

Design Thinking

Analysis By: Gene Phifer

Definition: Design thinking is a multidisciplinary process used to improve the design of everything from business software to consumer products and services. It is a creative process starting with empathy for users and the gathering of insight into their needs and motivations. These are then developed using an iterative, experimental approach. Deep customer insight combined with a creative process is ideal for digital innovation and digital product development. Design thinking helps to clarify high-value opportunities, and to design high-value solutions.

Position and Adoption Speed Justification: Design thinking dates back to the Industrial Revolution. It has been used by product teams and other areas outside IT for decades, but adopted by the world of enterprise IT only in the past eight to 10 years.

Design thinking has seen an accelerated adoption by enterprise IT. Many design groups, teams, and centers of excellence now commonly use design thinking as part of their design methodologies. While many enterprises have adopted design thinking, many organizations have yet to fully embrace it. A bright spot is the product teams in the business that have embraced design thinking as key to their digital product delivery.

With the advent of COVID-19, digital forms of engagement for all audiences have become paramount. Design thinking has cemented itself as a critical methodology for delivering new products and services grounded in customer experiences and using new technologies. Design thinking is now common among software vendors, system integrators and digital agencies.

User Advice: Design thinking is important for digital business innovation, but also for business optimization and normal business growth. To make progress with design thinking, you must:

- Address the need for digital engagement with selective application of design thinking.

- Build cross-functional teams, drawing from business units and the IT department. Train them in the process of design thinking and give them time to practice it. In most cases, start simply and on a small scale. Take on more complex projects progressively, as experience grows. Consider design centers of excellence (CoE).

Modify your design thinking approaches to support the no-travel, contactless world of COVID-19 by supporting remote design thinking workshops. The keys here are (1) a collection of digital collaboration tools, (2) electronic conference rooms, (3) multiscreen capabilities for individual WFH workers, and (4) application of DesignOps (see "DesignOps: Organize, Collaborate and Innovate Product UX at Speed")

Sample tools for remote design thinking workshops include:

Overall: Microsoft Teams, Google Meet, Zoom, Cisco Webex

Empathize: Typeform, Creatlr

Define: Snaply, Userforge

Ideate: Google Docs, Microsoft 365 Shared Docs, SessionLab, Stormboard, Ideaflip

Prototype: Boords, Mockingbird, Marvel POP

Test: UserTesting, Hotjar, PingPong

Entire Process: Sprintbase, InVision, MURAL, Miro.

Business Impact: Design thinking has the potential to create innovative products and services.

Design thinking also highlights the importance of having a digital design culture based on collaboration and innovation. Design thinking is a process of involving users, customers, developers, architects, product managers and all parties involved to collectively solve the challenge at hand. Design thinking will play a role in the IT-to-business continuous dialogue but also improve the digital dexterity of organizations.

In a COVID-19 world, digital engagement is required, and design thinking can help your teams deliver high quality digital results. The traditional approach to design thinking workshops, having everybody in the same room working collaboratively, may not be possible for some time. Be flexible, with one end of the spectrum being 100% digital/remote, and the other end being 100% in-person, knowing that different parts of the world will be at different parts of that spectrum for some time.

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: Accenture; frog; IBM; IDEO; Oracle; Pegasystems; Salesforce; SAP

Recommended Reading: "DesignOps: Organize, Collaborate and Innovate Product UX at Speed"

"Toolkit: Design Thinking"

"Ignition Guide to Conducting a Design Thinking Workshop"

"To Scale Digital Design, Add Just Enough Design Thinking Method to Agile Practices"

EA Governance

Analysis By: Saul Brand

Definition: Enterprise architecture (EA) governance refers to the EA activities of defining guidance of decision rights and the required processes, policies and procedures for the successful execution of investment decisions in support of the business strategy and direction. EA assurance (that is, compliance) efforts are focused on ensuring that the agreed-on viewpoints, principles and standards created during the architecture creation process are realistic, realized and adhered to.

Position and Adoption Speed Justification: Traditional EA was about "command and control," which is why it got a bad reputation as being bureaucratic and seen as an ivory tower. Today, it's possible to architect for agility and adaptability — by adopting a guardrails approach — giving the organization, project and product teams much needed flexibility.

Many of our clients are making changes to their IT operating model which is being driven by the shift from project to product. Because of the shift from project to product, they find themselves having to rethink the role of EA in the changing IT operating model. More specifically, the role of EA governance, assurance, and review boards as they move deeper into digital business.

Between April 2019 and April 2020, we spoke with 249 clients about the evolving role of EA governance, assurance and review boards in projects, as well as, products and agile development. During these inquiries, clients wanted advice on three things:

1. Rethinking EA governance, assurance and review boards with respect to digital business and projects.

2. How to dispel the half-truth that, "if you do agile development, then you don't need EA or EA governance."

3. How to reposition and enable EA to play an active role in digital product management and agile development.

These clients wanted advice from Gartner on how to find the right balance between:

1. Helping the enterprise foster continuous innovation, integration and delivery.

2. Instituting the right type and amount of EA governance and assurance to mitigate risk, which is often an unintended consequence of agile development.

As such, we position this profile in the Trough of Disillusionment (formerly in the Peak of Inflated Expectations) since client interactions covering the abovementioned topics increased 82% on a year-over-year basis from 2019 to 2020.

User Advice: To circumvent business leaders, project sponsors, product managers/owners and agile teams perceiving EA governance, assurance and review boards as a roadblock and impediment to advancing digital business, EA programs must:

- Identify targeted business outcomes and ensure that EA governance is positioned to achieve those outcomes by doing more than just adding more controls, assurance and governance.

- Develop and apply standards through the EA governance model, which is informed by the business strategy and corporate governance. Clarify accountability and provide the focal point for agile, effective and efficient decision making.

- Create a strategic review board (SRB) and an architecture review board (ARB). Ensure that the SRB and ARB are resourced with the appropriate business and IT representatives. Keep the SRB focused on broad strategy and investment decisions, and keep the ARB focused on more detailed logical and implementation decisions.

- Shift from a primarily top-down and formal EA governance to a more collaborative, facilitated and informal EA governance which can be achieved through a guardrails approach.

- Establish a community of practice (CoP) that advocates freedom and responsibility for agile teams, avoids getting involved in the day-to-day activities of the agile teams, and ensures the minimum viable architecture continuously evolves by providing voting rights to the members of the CoP.

- Help the enterprise find the right mix and balance between enterprise risk and agility.

Business Impact: Effective EA governance and assurance help position the organization to deliver digital business outcomes by focusing on orderly and coherent strategy formulation and execution. It adds to business value throughout the strategy formulation and execution process — first by providing the deliverables needed to support stakeholder investment decision making, and then by orchestrating stakeholder involvement and interaction. This is done formally through the governance model and informally through the EA program's daily work with project and product stakeholders.

Successful EA governance is driven by collaboration, communication and facilitation. Effective EA assurance is the formal process of reviewing new and ongoing activities to ensure they are compliant with the defined guidance and policies, minimum viable architectures, reference models, standards, and approving or declining exceptions to these guidelines and policies. Effective EA governance:

- Moves the organization closer to its strategic targets and delivery of targeted business outcomes.

- Facilitates a collaborative relationship with the business, project and product teams, which is vital for realizing the future-state architecture.

- Ensures that coherent strategy execution occurs when the decisions for the organization's architecture are constrained by risk.

- Ensures compliance aligns itself with the overall investment decision making in the organization.

Benefit Rating: Transformational

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Sample Vendors: Planview; QualiWare; Software AG

Recommended Reading: "8 Steps to Start or Restart a High-Impact, Business-Outcome-Driven EA Program"

"Rethink EA Governance, Assurance and Review Boards in the Digital Business Era"

"From Project to Product Management: The Role of EA Governance and Assurance in Agile Development"

"Avoid the 13 Worst EA Practices and Ensure Your Success in the Digital Business Era"

"Leadership Vision for 2020: Enterprise Architecture and Technology Innovation Leader"

"Stage Planning a Business-Outcome-Driven Enterprise Architecture"

"Succeed With Digital Business Through Adaptive Governance"

"Gartner Defines 'Governance'"

"Define EA Governance to Deliver Targeted Business Outcomes"

Information Architecture

Analysis By: James McGovern

Definition: Information architecture is the part of the enterprise architecture (EA) process that describes the current state, future state and guidance necessary to flexibly share and exchange information assets to achieve effective enterprise change. This is accomplished through a set of requirements, principles and models. Information architecture also formalizes the map of technology capabilities for analyzing and organizing data aimed to match the requirements to deliver business value to all types of decision makers (human and machine).

Position and Adoption Speed Justification: Information is the lifeblood of digital business. As pervasive sensing approaches drive the instrumentation to collect, share and develop insights into all facets of business activities. Stand-alone information architectures are insufficient for the emerging data economy. The challenge for enterprise architects, policymakers and information management professionals is how to plan, design and implement information-sharing environments, given a large number of information silos and the difficulties teams have coordinating activities enterprisewide. Mastery of information architecture practices creates the potential to alter the competitive landscape and provide increased business insight.

Most businesses are starting to recognize limitations to traditional data warehouse approaches (focused on a single version of the truth for internal structured data). Although there are case studies outlining the benefits of information architecture, those who pursue this approach face significant challenges and will take longer to reach maturity, although the best practices to achieve it may be well-known. The two challenges that most need to close are that the supported analytics excludes unstructured information and that the supported analytics cannot provide in-the-moment insight supporting intelligent responses to emerging situations or contextual versions of the truth. The penetration is higher than should justify its positioning, because these points have not been resolved. As such, we have positioned at peak-trough midpoint. Beyond these three, other limitations are widely recognized:

- There is an inability to store and process ever-growing amounts of information.

- Accommodating new information sources is exposing the need to shift to a built-for-change mindset.

- The latency between the time information is produced and when it can be effectively consumed is unacceptable.

- Full accountability in knowing that data is current, correct, present and usable across multiplatform data architecture is often difficult to manage and afford.

- Understanding where information architecture begins and ends is increasingly challenged by databases not officially managed by IT.

- Concepts such as governance, integration, system management processes, records retention and system logs matter in operational/transactional architectures, as well as analytical architectures.

User Advice: Information architecture is an input to and the output from information strategy. Organizations can achieve significant business results and position the organization for competitive advantage by:

- **Mapping the information architecture to your business strategy.** Leverage tools such as business capability modeling to understand the information impacts to the organization's critical business imperatives.

- **Communicating information's key role in overall business success.** Use quantifiable metrics linked to business key performance indicators (KPIs), whenever possible.

- **Treating information as a strategic asset.** Information warrants its own strategy to ensure that its economic benefits are fully maximized. Leading organizations will begin indirect and direct data monetization, making metadata and master data essential for business outcomes to capture value and minimize risk.

- **Staying ahead of digital disruptions.** Use Gartner's Digital Transformation Framework to give EA leaders the concepts, tools and examples to accelerate the ideation process. As a result, they can stay in front of the disruptive impacts caused by advanced machine learning (ML), the Internet of Things (IoT), big data and advanced analytics.

- **Planning for the potential usage of new information sources.** Connecting people to content (e.g., data, information and knowledge) often requires leveraging third-party data sources. IoT will drive enterprise needs to collect, manage and analyze rich, real-time data sources. Connecting consumer sentiment, customer behavior and other sources of information can transform business models in novel ways.

Business Impact:

- **Customer-Driven Insights.** Understanding customer buying habits, purchasing behaviors, churn and missed opportunities can enable enhanced personalization and targeted promotions, along with service and product catalog refinements. Leading retailers use this to provide

incentives using location data, current inventory and staffing levels to deliver enhanced shopping experiences.

- **Strategic Decision Making.** Visibility across the enterprise to make important decisions, which requires investments in common data models and governance.

- **Proactive Risk and Compliance.** Integrating a diverse set of use cases, including traditional risk management; cybersecurity; third-party management; business resilience; environmental, health and safety; and regulatory compliance.

- **Enabling Innovation.** Data presents an invaluable opportunity for firms to innovate, but only if they know what to do with it.

Benefit Rating: High

Market Penetration: More than 50% of target audience

Maturity: Early mainstream

Sample Vendors: Caserta; Deloitte; Evolytics; ExistBI; TCS

Recommended Reading: "Toolkit: Sample Job Description for the Role of Information Architect"

"Innovation Insight for Continuous Intelligence"

"How to Optimize Business Value From Data and Analytics Investments … Finally"

Solutions Architecture

Analysis By: James McGovern

Definition: Solutions architecture refers to the enterprise architecture (EA) activities of creating deliverables that guide the direction for managing a portfolio of solutions toward achieving targeted business outcomes. Organizations are increasingly building digital platforms as part of their digital strategy. The platform is as much an architecture strategy as it is a business strategy. Solutions architecture plays a vital role in the platform's development, from ecosystems modeling and creating the business model, to APIs/microservices that enable it.

Position and Adoption Speed Justification: Solutions architecture conceptualizes, creates and communicates a shared technical vision via high-level design artifacts to address current and anticipated future business needs. Modern solutions architecture may also focus on syncing platforms and products together within a business context. The approach to solutions architecture may leverage other architecture approaches, including application, information, cloud and security. Characteristics of viable solutions include availability, performance, scalability and security (see "Use Quality Attributes to Align Business Requirements and Guide Solution Architecture"). Solutions architecture also establishes boundaries and sets business-outcome-focused expectations for such approaches.

Solutions architecture continues a slow slide toward the Trough of Disillusionment, as this particular discipline has not kept pace with technology change in many organizations. Successful solutions architects understand that being a good steward of the technology strategy, consistently bringing both innovative and continuous improvement ideas to the table, and increasing speed of delivery by focusing on minimum viable products are key. Aligning agile teams to a shared technical direction is of growing importance. Advanced solutions architects are master change agents and understand the importance of having strong business skills and mastery of human interaction.

User Advice: A key value of EA is that of productively and holistically guiding investment and optimization decisions across business and IT. It is crucial for organizations to leverage solutions architecture to look for opportunities to optimize solutions across the portfolio, with a focus on delivering business outcomes. We recommend:

- Match your solutions architecture efforts to your organization's operating model. Solutions architectures that are aligned with a business domain, combined with a strong community of practice, can enable effectiveness in both centralized and federated models.

- Ensure those creating solutions architectures understand business value and desired outcomes to improve capture of business requirements as well as better focus development teams.

- Use an iterative approach to solution design, moving between requirements, features and technology to achieve the optimum balance.

- Apply pace layering to determine the appropriate level of EA alignment. Understand all dependencies, ranging from platforms to infrastructure, and minimum viable products as well as minimum viable architectures.

- Adopt a security architecture framework to provide a structured approach to the steps and processes involved in developing solutions architectures.

Business Impact: Solutions architecture implemented in a disciplined manner delivers business value:

- Financial discipline — Better budget predictability, tighter delivery time frames, and traceability from requirements to cost.

- Risk management — Reduced uncertainty in feasibility of proposed solution. Reduction in overall number of troubled implementations.

- Collaboration — Smoother stakeholder/IT communication.

- Better solutions — Enterprise concerns, such as security and compliance, included on Day 1 are interwoven into all recommendations, reducing remediation activities.

As organizations increasingly focus their EA efforts on the delivery of business outcomes, solutions architecture must create better cohesion in the "strategic planning to execution" life cycle. Solutions architecture is at the center of timely architecture decisions that balance risk, cost and time to market.

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Sample Vendors: Accenture; Capgemini; HTC Global (Ciber); Neos; Slalom; Solution Architects; Tata Consultancy Services (TCS); ThoughtWorks; Zensar

Recommended Reading: "Hiring Guide for Solution(s) Architect"

"Peer Connect Perspectives: How to Structure Solution Architects in an Organization"

"How to Prepare for the Future of Applications"

"How to Architect Continuous Intelligence Solutions"

"How Architecting for Next-Generation Experiences Helps to Deliver Customer and Business Outcomes"

"12 Things to Get Right for Successful DevSecOps"

Climbing the Slope

Trendspotting

Analysis By: Samantha Searle

Definition: Trendspotting is a proactive capability that informs organizations on the right time to respond to a trend. It tracks emerging technologies and other trends, detecting potentially disruptive market developments. By identifying market disruptions exposed by emerging technologies, enterprise architecture and technology innovation leaders, including CTOs, can analyze the strategic relevance and potential impacts of these disruptions. Impact assessments and recommendations from trendspotting fuel deliberate innovation in the organization.

Position and Adoption Speed Justification: Gartner has positioned trendspotting as being "on the rise" from the Slope of Enlightenment. We expect adoption to increase in the current crisis, as trendspotting becomes recognized as a critical technique for navigating uncertainty and guiding scenario planning. A recent Gartner survey revealed that 61% of organizations leverage trendspotting and radar diagrams as key innovation techniques. Furthermore, Gartner has seen an increase in CTOs looking to establish an office of the CTO that includes trendspotting capabilities.

However, our research reveals that it is often an informal, niche activity. Organizations sometimes neglect to perform a more detailed trendspotting analysis that would enable them to determine when and how to respond to a trend, rather than make the simple decision of whether to implement the technology that supports a trend. Trendspotting is early mainstream as a key part of strategic and innovative planning; however, it has the potential for broader, in-depth use.

User Advice: Enterprise architecture and technology innovation leaders should develop a trendspotting method that analyzes a trend through three main categories:

- Assessing the potential impact of a trend, from the perspectives of people, business, IT departments and the technology market.

- Evaluating the factors that influence how rapidly a trend matures and is addressed by organizations.

- Determining the technology market dynamics surrounding the trend, such as vendor marketing and current projects.

In addition, leverage a political, economic, social, technological, legal and environmental (PESTLE) analysis that includes nontechnological trends as well as technology trends. Trendspotting fits into the acquire phase of Gartner's Continuous Foresight model (see "Inventing the Future With Continuous Foresight").

Our advice is:

- **Set your business focus.** Identify and prioritize trendspotting efforts on the business capability areas that add the most strategic relevance during the next three to five years. Determine the business outcomes to which they should contribute.

- **Maximize the program by federating technology scouts.** It can be limiting to have just one group that's responsible for trendspotting. Create an inclusive program that defines the rules, so that anyone can participate.

- **Perform an opportunity analysis.** Use scenario planning to validate how a trend can help to seize new opportunities, such as business model innovation, IT modernization, improved customer experience or product/service innovation.

Business Impact: Forty-five percent of CTOs proactively invest in technology that has not been specifically requested by the CIO or CEO. Without a trendspotting capability, CTOs are unlikely to detect potentially valuable emerging technologies that the organization was not already considering.

The real value of trendspotting capabilities lies in providing the business with the ability to respond to a trend at the right time. Timing is crucial. Cost, risk, complexity, usability and social acceptance determine whether embracing a trend, and implementing the technology that drives it, will succeed or fail. This means identifying the moment when the trade-off between benefit and risk of responding to a trend is acceptable and advantageous to the organization.

However, trendspotting can only deliver business value if it's well-aligned with business activities. Socialize with business leaders and discuss their findings to determine what these trends could mean for the organization.

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Sample Vendors: ITONICS

Recommended Reading: "Use a Trendspotting Method to Identify the Technology Trends You Need to Track"

"How to Respond to a Technology Trend"

"Inventing the Future With Continuous Foresight"

"Hype Cycle for Emerging Technologies, 2018"

"Toolkit: Create Your Own Hype Cycle With Gartner's Innovation Database"

Architecture Roadmaps

Analysis By: James McGovern

Definition: An architecture roadmap is a graphical representation commonly used by enterprise architects to illustrate the milestones and deliverables required to manage change to a future state from the current state over a specific period of time.

Position and Adoption Speed Justification: A roadmap is a graphical representation used to illustrate the milestones, deliverables and investments required to manage change to a future state from the current state over a specific period (see "Best Practices for Delivering Targeted and High-Impact Roadmaps").

As such, roadmaps should be critical, well-used deliverables to help business and IT leaders make effective investment decisions, to guide the coordination of complex projects, to provide insight to help strategic planning, and to help inform business and IT operations.

However, we often find that a gap exists between the overly complex and technically oriented bottom-up roadmaps that EA practitioners have traditionally created and the business-outcome-driven needs of business and IT stakeholders. A recent Gartner survey of attendees of a roadmap webinar shows that 14% of organizations do not have or use roadmaps, and another 34% use only tactical roadmaps. The penetration is higher than should justify its positioning but Gartner has observed among its client base that organizations are doing a good job of creating initial roadmaps. Many organizations struggle to keep roadmaps refreshed due to lack of tools and practices to enable this. Therefore we have positioned architecture roadmaps at post-trough 45%.

User Advice: Enterprise architects should ensure that the EA team remains focused on the primary audience by writing the name of the audience on the roadmap deliverable so others realize it was created with a specific target audience perspective in mind.

Pin down the challenge or opportunity key stakeholders face by determining the type of deliverable needed, as well as the scope and focus for the roadmap.

Integrate components of their business outcome statement in roadmaps by including business strategy, disruptive trends, executive concerns, future state and, most importantly, target business outcomes.

Engage stakeholders and get agreement on both the overall business outcomes for the roadmap end state and incremental business outcomes, including their timing (for example, quarterly versus. annually).

Ensure your roadmap reflects a statement of intent and that it is updated regularly.

Business Impact: The benefit of architecture roadmaps is rated high because roadmaps are one of enterprise architects' most critical deliverables in driving the execution of business strategy. Roadmaps assist with:

- **Communicating business change:** Roadmaps express and communicate vision, ensuring that all parts of the organization are on the same page.

- **Connecting strategy with execution:** Roadmaps demonstrate enterprise architects' understanding of strategy and business outcomes to business executives, while informing program and project teams of the required capabilities to be delivered.

- **Assessing the impact of disruption:** Roadmaps can be used to explore and explain the impact of innovations on the desired future state and on planned and potential business outcomes.

- **Empowering technology-enabled decision making:** Combine roadmaps with the art of storytelling to engage challenging stakeholders and gain a mandate to support EA's roles in making decisions.

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Sample Vendors: Aha!; ITONICS; Jibility; Planview; ProductPlan; Roadmunk; Software AG; Sopheon

Recommended Reading: "Best Practices for Delivering Targeted and High-Impact Roadmaps"

"Create Roadmaps That Support Decision Making and Communicate Strategy Effectively"

"Classify Roadmap Styles to Guide Roadmap Development"

"IT Roadmaps: A Reference Manual for Roadmap Visualization"

"Capability Roadmaps"

"Scenario Roadmaps"

"Four Flavors of IT Roadmaps"

Digital Optimization

Analysis By: Kristin Moyer

Definition: Digital optimization is the process of using digital technology to improve existing operating processes and business models.

Position and Adoption Speed Justification: Digital optimization involves doing old things in new digitally centered ways. Improving efficiency, improving customer experience and selling more of existing products are all examples of digital optimization. Many enterprises are investing in basic but effective technology to deal with COVID-19 — for example, new digital channels and automation (see "Fancy Tech Not Required for Recovery"). This is different from digital business transformation, which is focused on changing the business model.

CEOs are increasing their focus on digital business transformation. According to a Gartner survey, 82% of CEOs say they have a digital transformation initiative, up from 62% in 2018 (see "2019 CEO Survey: The Year of Challenged Growth"). However, digital optimization is equally important. Innovation is all around us as CIOs and IT leaders respond to COVID-19. Much of it is focused on using technologies like streaming, e-commerce and mobile apps to reopen for business and help employees remain productive, which are all examples of digital optimization (see "Fancy Tech Not Required for Innovation").

Today, a large number of technology service providers, consulting firms and other advisory firms are now labeling every type of digital project as "digital transformation." Based on discussions with clients and vendor briefings, the vast majority of these digital initiatives are focused on digital optimization. These activities have taken place for years with the advent of cloud computing, mobile and social applications, and advances in data and analytics technologies, to name a few. Despite the repackaging of digital optimization as digital transformation, we are placing digital optimization heading toward the Plateau of Productivity in recognition of its use as an established practice in a majority of organizations.

User Advice: A digital optimization strategy is favored by enterprises whose industries are not going through disruption in the near term. Radical digital optimization can be disruptive if executed constantly and consistently over time. However, enterprises will tend to minimize the amount of change and risk by favoring optimization over transformation. This can be a risky course, as there have been some major misreads with industries being disrupted in recent years. Between AI, Internet of Things, platform business models and blockchain, almost any industry has the potential to be disrupted.

Gartner recommends that CIOs know the difference between digital optimization and digital business transformation (that is, the process of exploiting the latest digital technologies and practices to create a robust new digital business model). Use this understanding to determine your enterprise's mix of digital business optimization and transformation activities by looking outside your enterprise first. If your industry (or an adjacent industry) is going through disruptive changes, then you will have no choice but to set a transformation course yourself. If your industry is not

undergoing a transformation, then you have the option of pursuing a digital optimization course — unless you want to be the disruptor and force the industry to transform.

Competitive differentiation could still be gained through this definition of optimization even though it's not achieving digital business. For example, achieving same-day delivery is enabled best with cloud, smart robots and so on. However, this could still be done with nondigital means and so is not a digital business.

Business Impact:

- Digital optimization applies digital technology to improve existing business processes and other assets. It improves productivity by reducing cost and improving the efficiency of machines and employees.

- Digital optimization improves the way organizations engage with their customers by using digital sales and marketing technologies like mobile, analytics and chatbots to deliver more frictionless and relevant experiences. Competitive differentiation could still be gained through digital optimization. For example, achieving same-day delivery is enabled best with cloud, smart robots and so on. However, this could still be done with nondigital means and so is not a digital business.

- In digital optimization, the value proposition of the business itself does not change, though it is delivered more efficiently.

- Digital optimization can improve existing revenue — for example, by using analytics and AI to better forecast demand and supply and to optimize prices and promotions.

- Digital optimization renovates and updates core technology and business services to enhance the existing business model and prepare for digital business transformation initiatives if the organization chooses to do so.

- Digital optimization includes adopting organizational behaviors, capabilities and practices (such as design thinking, collaboration and agile development) required to unlock the full potential of digital technology within the existing business model.

Benefit Rating: High

Market Penetration: More than 50% of target audience

Maturity: Mature mainstream

Recommended Reading: "Digital Business Ambition: Transform or Optimize?"

"Fancy Tech Not Required for Recovery"

"A CIO's Guide to Gartner's Digital Business Research"

"Toolkit: Examples of Digital Business Optimization"

"Digital Business KPIs: Defining and Measuring Success"

Enterprise Architecture

Analysis By: Philip Allega; Saul Brand

Definition: Enterprise architecture (EA) is a discipline for proactively and holistically leading enterprise responses to disruptive forces by identifying and analyzing the execution of change toward desired business vision and outcomes. EA delivers value by presenting business and IT leaders with signature-ready recommendations for adjusting policies and projects to achieve target business outcomes that capitalize on relevant business disruptions. EA is used to steer decision making toward the evolution of the future-state architecture.

Position and Adoption Speed Justification: Leading EA programs are evolving the discipline toward the Plateau of Productivity; however, the evolution to a modern program focus is challenging. Leading EA practices support technology innovation planning to address digital business disruptions. We find that 25% lead technology innovation efforts today (n = 209, March 2020), with 18% assessing steps to support technology innovation in the coming year; 42% are sought after for innovation advice concerning the consumption of technology to deliver business outcome. This is a positive move, but many continue to focus upon value to managing the IT estate of supporting IT delivery processes only. Adoption and clarity of EA value slows the move toward the Plateau of Productivity over the next five to 10 years.

Enterprise architects focus on delivering signature-ready deliverables that drive business outcomes in support of the business operational change. Leading enterprise architects have embraced the role of strategic advisor on a variety of topics including technology innovation, business model changes and digital platform strategies, but the majority still lag.

EA practitioners are leading the evolution of EA in five key ways:

- Rethinking EA as an internal management consultancy supporting a continuous business and IT strategy and planning effort.

- Refocus to external business ecosystems and digital platform strategies.

- Acting as critical advisors for CIOs and other CXOs on digital business issues.

- Providing a holistic architectural direction to build out the digital business technology platform.

- Creating deliverables that bridge the gap between opportunities, threats and execution challenges to enable investment decision making.

User Advice: The role of enterprise architect and technology innovation leader has transformed over the past few years:

- Since 2011, enterprise architecture has evolved from being framework- and process-driven to becoming business-outcome-driven.

- Since 2013, driven by digital business, enterprise architects have dramatically increased their focus on technology innovation.

- Since 2015, enterprise architects have shifted focus from being purely internally focused to becoming more externally focused on the digital business ecosystem.

- Since 2016, enterprise architects have been conceptualizing the digital business platform that enables organizations to become digitally agile.

- Since 2017, enterprise architects have focused on delivering digital business value at scale.

- Since 2018, enterprise architects have crossed the tipping point to act as an internal management consultancy.

- Since 2019, enterprise architects are beginning to design intelligence into their organization's business and operating models, not IT alone.

The challenge for enterprise architecture and technology innovation leaders is to transform themselves and develop the entirely new set of skills required for the digital business age, and the rate of change continues to increase in response to nontechnology disruptions. Enterprise architects must expand their skills and competencies to fulfill the role today. They must be able to flexibly respond to rapid change, accepting that target state journeys are no longer linear. They must begin to measure their value add to the business, and not just IT.

Business Impact: Digital, agile, and the response to the pandemic disruption is transforming organizations and EA itself, with enterprise architects bringing business and technology together to deliver new business and operating models. Enterprise architects who focus on the most significant business disruptions and outcomes that the organization faces also focus on the deliverables that will guide the organization through the required change; they are, in turn, able to demonstrate the highest business impact and value.

High-value EA organizations' scope of EA change includes business, information, solutions and technology:

- Focus upon changes in the business and operating model to deliver new value to the enterprise, not just IT.

- Expand EA skills and competencies in design, using approaches such as design thinking, lean startup and agile.

- Become a strategic advisor to the CIO and other CXOs with EA services that help them define their digital business vision.

- Develop deliverables that are immediately valuable to business and IT leaders, including roadmapping, disruption radar maps and portfolio management that address digital business innovation.

Benefit Rating: High

Market Penetration: More than 50% of target audience

Maturity: Mature mainstream

Sample Vendors: Ardoq; Avolution; BiZZdesign; LeanIX; MEGA International; Orbus Software; Planview; QualiWare; Software AG; Sparx Systems

Recommended Reading: "Predicts 2020: Enterprise Architecture Enables the Intelligent Organization"

"Leadership Vision for 2020: Enterprise Architecture and Technology Innovation Leader"

"Enterprise Architecture Primer for 2020"

"Technology Innovation Primer for 2020"

Enterprise Architecture Tools

Analysis By: James McGovern; Derek Miers

Definition: Enterprise architecture (EA) tools are software applications or platforms designed to support enterprise architecture and technology innovation leaders, as well as business and IT stakeholders. EA tools offer support for strategic business planning, analysis, design, innovation and continuous improvement. EA tools drive the capture, contextualization and visualization of information from business, ecosystems, solutions and technology domains.

Position and Adoption Speed Justification: EA tools are beginning to enter the Plateau of Productivity. EA tools are vital in helping to make EA a strategic planning discipline that delivers targeted business outcomes and helps link IT efforts to business direction and strategy. The ultimate purpose of an EA tool is to facilitate investment decision making in and across the IT estate.

Organizations need EA tools to pivot between current- and future-state architecture viewpoints, while supporting, and interfacing and interoperating with, other disciplines. These include innovation management, enterprise risk management, and program and portfolio management. They must:

- Deliver actual value to the broader organization so that stakeholders can collaboratively use EA tools for analysis and decision support.

- Drive innovation in support of digital transformation. Organizations must evaluate emerging technologies, and enable innovation with structured, flexible and iterative methods.

- Enable enterprise architects to capture details of the future architectural state required to support digital transformation.

- Manage the current state of the IT portfolio and guide technology projects, emphasizing factors such as cost optimization and risk management.

- Model business processes and rules, information resources, information exchange, business ecosystems, applications, and services.

The need to effectively drive digital business, cost optimization and innovation should increase demand for and usage of EA tools. Historically, the early adopters of EA tools were large enterprises from Financial Services, Healthcare and Government. Via data gathered as part of our Magic Quadrant analysis, we have seen increased adoption in industry vertical segments that aren't known

to be leaders as well as increased adoption in midsize organizations and position Enterprise Architecture tools at pre-plateau 35%.

User Advice: EA tools become necessary when the business environment becomes complex. The IT landscape is complicated, and EA artifacts can be challenging to manage. EA teams seeking to leverage an EA tool must understand that successful acquisition and adoption require a business value proposition as well as IT and business stakeholder support. Enterprise architects must:

- Ensure they develop use cases that link functional requirements and critical EA tool capabilities to targeted business outcomes.

- Assess the commitment and skills of the EA team and others to use an EA tool before the acquisition.

- Clearly articulate the compelling business problems that an EA tool will help solve or the opportunities it will allow the organization to exploit.

- Determine the complexities and require a commitment to implement a tool within their organizational culture successfully.

- Map data requirements to ensure that quality data is stored in the system.

- Assess integration needs with complementary tools such as configuration management database (CMDB), portfolio management, IT financial management and governance, and risk and compliance (GRC).

Business Impact: Maximum business value from EA tools is realized when information is used by both IT and business decision makers to link future-state business capabilities to targeted business outcomes. Such information may include impact analysis, scenario planning and the execution of EA initiatives. Therefore, the tools employed by EA practitioners today cannot be focused on the creation or management of artifacts alone. We see an increasing focus on monitoring and execution as a key enabler to improving the chances of achieving these targeted business outcomes. A tool enables the analysis of the impact of choice upon target business processes, technologies, applications, information, relative to desired business outcomes

EA tools help EA practitioners (serving as an internal management consultancy) and their organizations facilitate change across the four main viewpoints of EA (i.e., business, information, solutions and technical). EA tools can assist with cost-benefit, risk and impact assessments. These include cost-saving/cost-avoidance opportunities, risk mitigation, identification and impact of new revenue opportunities, mergers and acquisitions, planning business-led/IT-enabled transformations, and analyzing the impact of business disruptions (including, but not limited to, technology).

EA tools enable the analysis of the impact of choice upon target business processes, technologies, applications, information, relative to desired business outcomes.

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Sample Vendors: Avolution; BiZZdesign; Clausmark; Enterprise Architecture Solutions Ltd.; MEGA International; Orbus Software; Planview; QualiWare; Software AG

Recommended Reading: "Magic Quadrant for Enterprise Architecture Tools"

"Critical Capabilities for Enterprise Architecture Tools"

"Rethink EA as an Internal Management Consultancy to Rapidly Deliver Business Outcomes"

"Adapting Enterprise Architecture for Agile at Scale"

"Peer Lessons Learned: Implementing Enterprise Architecture Tools"

"Architecture Governance"

Entering the Plateau

Agile Ops

Analysis By: George Spafford

Definition: Agile ops is a philosophy and not a methodology. The term "agile ops" refers to the increased need for I&O to rapidly respond to changes in customer requirements. In situations where application development is involved, this leads to the development of DevOps capabilities. In cases where there is no custom application development activity, then I&O must pragmatically leverage concepts from agile application development, lean, DevOps and site reliability engineering (SRE).

Position and Adoption Speed Justification: Agile ops is not a "practice" in and of itself. Instead, it is a pointer to proven methods that I&O leaders need to learn about and pragmatically adopt to improve the agility of their organizations. Many concepts from DevOps are leveraged to improve responsiveness. DevOps has reached the plateau in 2020 and this means the concepts underpinning agile ops have as well.

User Advice: For I&O leaders who have been mandated to adopt agile, or have identified the need to "improve agility," identify which of the following four scenarios seems to best fit:

1. Is the requirement a general need to improve I&O's ability to respond quickly when changes are needed but does not directly include application development?
   If so, investigate the use of Kanban, Gemba Kaizen, collaboration, small teams and extensive automation. A great deal can be learned by looking at the practices used in lean, Theory of Constraints, DevOps and SRE.

2. Is there a desire to adopt agile product management techniques for I&O?
   If so, investigate the use of scrum and Kanban along with lean techniques, minimum viable product and continuous improvement.

3.   Is there a desire to actually use agile development and proper software engineering principles in the increasingly programmable space of I&O?

     If so, investigate both agile and DevOps for these situations along with product and platform organizational models. Start to regard the infrastructure as a set of software products to be properly designed, documented, tested, version controlled and placed in a shared repository with proper metatagging.

4.   Is there a desire to improve I&O agility to work more closely with agile application development teams?

If so, investigate DevOps and collaborate with stakeholders to begin iterative improvements.

Business Impact: I&O groups seeking to improve their ability to respond to changes in customer requirements can obtain significant improvements in the realization of value.

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Mature mainstream

Recommended Reading: "6 Steps to Increase DevOps Release Velocity by Removing Constraints"

"Use 8 Simple Steps to Get DevOps Right"

"Agile and DevOps Primer for 2020"

"DevOps Teams Must Utilize Site Reliability Engineering to Maximize Customer Value"

"Five Steps to Increase Development Release Velocity"

"How to Scale DevOps by Building Platform Teams"

"How to Manage and Market Platforms as Products for DevOps Teams"

"Maximize the Success of Enterprise Agile: Utilize DevOps as the Accelerator"
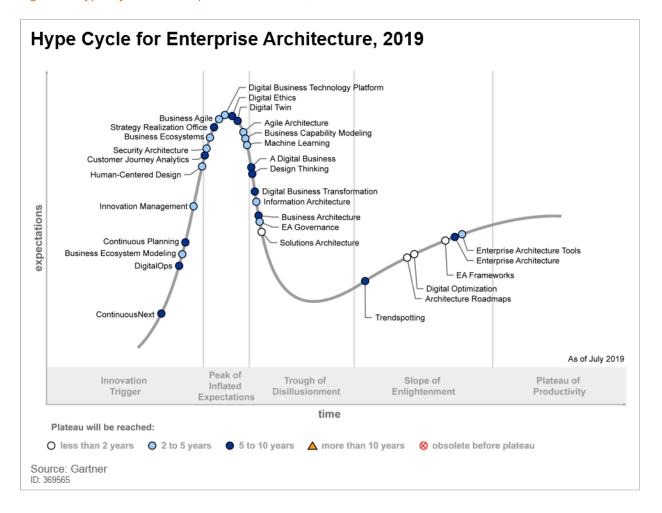
"Avoid Agile Transformation Failure by Using Agile Coaches"

"The Future of DevOps Toolchains Will Involve Maximizing Flow in IT Value Streams"

Figure 3. Hype Cycle for Enterprise Architecture, 2019

Hype Cycle for Enterprise Architecture, 2019

Hype Cycle Phases, Benefit Ratings and Maturity Levels

Table 1. Hype Cycle Phases

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

Source: Gartner (September 2020)

Table 2. 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 (September 2020)

Table 3. Maturity Levels

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

Source: Gartner (September 2020)

Gartner Recommended Reading

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

Understanding Gartner's Hype Cycles

Redesigning Your Enterprise as a Digital Business: A Gartner Theme Insight Report

Eight Ways Ecosystems Supercharge Business Models

A Digital Business Technology Platform Is Fundamental to Scaling Digital Business

DigitalOps Helps Connect Business Models to the Digital Business Platform

Predicts 2019: Enterprise Architecture Evolves Into an Internal Management Consultancy

Note 1 DigitalOps

DigitalOps enables the rapid development and adaptation of dynamic, real-time and scalable business products and applications on the digital business technology platform. It is an evolution of the automation aspects of business process management (BPM). DigitalOps incorporates decision management and event processing with agile methodologies for continuous delivery of business improvement in applications. It delivers a step-change improvement in business agility (see "DigitalOps Helps Connect Business Models to the Digital Business Platform").

Note 2 Digital Optimization

Digital optimization is the process of using digital technology to improve existing operating processes and business models (see "Four Definitions Make a Digital Business Strategy Process More Effective").

Note 3 Digital Business Transformation

Digital business transformation is the process of exploiting digital technologies and supporting capabilities to create a new, competitively robust, digital business model (see "Four Definitions Make a Digital Business Strategy Process More Effective").

GARTNER HEADQUARTERS

Corporate Headquarters
56 Top Gallant Road
Stamford, CT 06902-7700
USA
+1 203 964 0096

Regional Headquarters
AUSTRALIA
BRAZIL
JAPAN
UNITED KINGDOM

For a complete list of worldwide locations,
visit http://www.gartner.com/technology/about.jsp

Gartner, Inc. | G00467339