

Hype Cycle for Enterprise Architecture, 2023

Published 1 June 2023 - ID G00790240 - 128 min read

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Initiatives: [Digital Business Change Initiatives](#)

Already challenged by navigating economic headwinds, enterprises are sifting through the hype generated by AI and determining its best applications. Enterprise architects can use this research to cut through the uncertainty, and to set a balanced AI strategy grounded in delivering business outcomes.

Additional Perspectives

- [Summary Translation: Hype Cycle for Enterprise Architecture, 2023](#)
(26 September 2023)

More on This Topic

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

- [2023 Hype Cycles: Deglobalization, AI at the Cusp and Operational Sustainability](#)

Analysis

What You Need to Know

We live in volatile, uncertain, complex and ambiguous (VUCA) times. ¹ Business leaders must drive profitable growth and improve returns from digital spending despite slowing demand, higher interest rates, scarce, expensive talent and global supply constraints. ² A turbulent economy requires organizations to make smarter technology investment decisions, which means accelerating the use of digital technologies.

Today, a much-hyped part of the VUCA mix is artificial intelligence (AI). ¹

To counter the effects of economic headwinds, many organizations seek to invest in AI. New generative AI systems are a hot and urgent topic of discussion across business, government and society. To help put the AI hype in perspective, enterprise architecture (EA) leaders must help their organizations:

- **Explore new areas for AI business impact.** Modernize while carefully navigating complex and confusing market AI hype.
- **Figure out AI's best applications,** while also not losing sight of other key organizational business technology priorities and investments that require the attention of business and IT leaders.
- **See the bigger picture** to set an AI strategy for keeping ahead of the rapid pace of innovation.

The Hype Cycle

The selection and positioning of the innovations in the Hype Cycle for EA, 2023, tells a compelling story. While AI is the overarching major theme, this year's Hype Cycle has four other underlying themes that are equally important:

- **AI is front and center to this year's hype, but with trade-offs:** This year's Hype Cycle for EA contains seven AI-specific or AI-related innovations, whereas last year's EA Hype Cycle only contained two. Many EA leaders find themselves having to help their organizations strike a balance between AI and other digital business initiatives that enhance customer and employee experience, and those that optimize costs, such as migrating to the cloud. They are also challenging existing processes to make the organization faster, simpler and more agile. 2023 EA Hype Cycle AI innovations include:
 - AI engineering
 - Autonomic systems
 - Enterprise conversational AI platforms
 - Decision intelligence
 - Knowledge graphs
 - Machine customers
 - Machine learning

- **Innovation is rampant in enterprise architecture.** The 2023 EA Hype Cycle contains 32 innovations, whereas the 2022 EA Hype Cycle contained 28. The year-over-year growth in the number of innovations means EA leaders must focus on more innovations to help the organization navigate economic headwinds and demonstrate EA business value.

- **EA practices are in a state of flux.** The innovations in this year's EA Hype Cycle are mostly evenly distributed along the curve, with some crowding in the Innovation Trigger and the Trough of Disillusionment spaces. Overall, EA practices continue to mature. They are evolving from a traditional EA (technology-centric) approach to the now de facto standard — business-outcome-driven EA approach (with full buy-in from business leadership and leads with business architecture). Many EA practices seek to extend the business-outcome-driven EA approach to EA as an internal management consultancy (that is, the EA practice offers and delivers business-outcome driven EA services to business leaders and product managers).

- **EA enables customer and employee experience.** In response to VUCA, and as digital channels are increasingly the main vehicles for engagement, non-AI innovations such as total experience, operational experience, journey maps, value streams, business design and customer technology platforms have seen increased market adoption. These innovations are focused on helping the organization retain customers and scarce talent, as well as to improve organizational efficiency, resilience, operations and employee productivity.

Newer innovations featured on the Innovation Trigger offset many of the of the older EA-specific innovations that are moving down toward the bottom of the Trough of Disillusionment:

- Many of the older innovations such as business capability modeling have been in existence for many years. Client interest in those older innovations has peaked and/or diminished.
- Many of the older innovations, moving down toward the Trough of Disillusionment have become mainstream for many EA practices. For example, solutions architecture is now the de facto standard for many EA leaders planning, operationalizing and executing EA.
- The newer innovations, such as democratized architecture, minimum viable architecture and product architecture, are moving up toward the Peak of Inflated Expectations. This is where EA leaders should be spending time and focusing their attention so that they can rebrand and reposition EA practice capability, maturity and value to enable enterprise agility, resilience and innovation.

This year's EA Hype Cycle contains a number of new and fast-moving innovations of interest to EA leaders. Specifically:

New Entrants:

- AI engineering
- Business ecosystem modeling
- Decision intelligence
- Enterprise conversational AI platforms
- Knowledge graphs

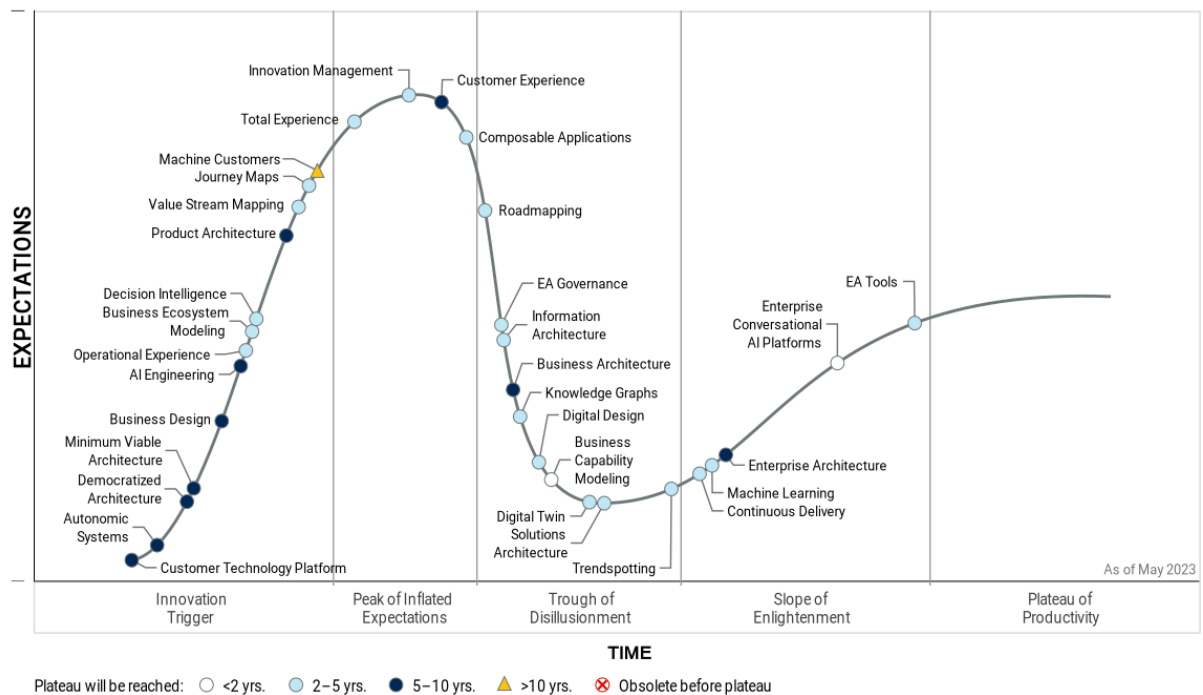
- Machine customers
- Operational excellence
- Roadmapping
- Total experience

Fast-Moving:

- Composable applications
- Digital twin
- Journey maps

Figure 1: Hype Cycle for Enterprise Architecture, 2023

Hype Cycle for Enterprise Architecture, 2023



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 speed to mainstream adoption underscores the challenges EA leaders face in:

- Framing the EA value proposition and its playbook (see Note 1) to its many organizational stakeholders and internal customers.
- Leveraging the innovations as part of the EA playbook to help the organization close the strategy-to-execution gap by helping business and IT leaders make smarter, better and faster technology investment decisions.

In this year's EA Hype Cycle, there are only two innovations that will reach maturity within two years, both becoming fully integrated into the standard practices of both business-outcome-driven EA and EA as an internal management practice:

- Business capability modeling
- Enterprise conversational AI platforms

Prepeak innovations, expected to plateau in two to five years, are of particular interest to EA practitioners as they are expected to become an important part of the EA discipline by 2028. EA leaders should adopt new approaches, tools and techniques to address their mission-critical priorities and the changing needs of their internal stakeholders. These include:

- Business ecosystem modeling
- Decision intelligence
- Journey maps
- Operational excellence
- Value stream mapping

Key five- to 10-year innovations that EA leaders should invest in, and focus on, to help ensure the long-term significance and value proposition of the evolving EA practice are:

- AI engineering
- Autonomic systems
- Business architecture
- Business design
- Customer experience
- Customer technology platform
- Democratized architecture
- Enterprise architecture
- Minimum viable architecture
- Product architecture

Table 1: Priority Matrix for Enterprise Architecture, 2023

(Enlarged table in Appendix)

Benefit ↓	Years to Mainstream Adoption			
	Less Than 2 Years ↓	2 - 5 Years ↓	5 - 10 Years ↓	More Than 10 Years ↓
Transformational	Enterprise Conversational AI Platforms	Decision Intelligence Digital Twin Innovation Management Journey Maps Machine Learning Total Experience	Autonomic Systems Customer Technology Platform Minimum Viable Architecture	
High	Business Capability Modeling	Business Ecosystem Modeling Composable Applications Continuous Delivery Digital Design EA Governance EA Tools Information Architecture Knowledge Graphs Operational Experience Roadmapping Trendspotting Value Stream Mapping	AI Engineering Business Architecture Customer Experience Enterprise Architecture Product Architecture	Machine Customers
Moderate		Solutions Architecture	Business Design Democratized Architecture	
Low				

Source: Gartner (June 2023)

Off the Hype Cycle

We continue to refine the Hype Cycle for Enterprise Architecture each year. Our approach to identifying, including and tracking innovations on the Hype Cycle includes:

- Evaluating the “hype” or depth and breadth of client interest by analyzing the volume of public internet searches and searches on gartner.com for specific innovation profiles or key terms.

- 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.
- Tracking innovations we think will be most valuable and interesting to enterprise architects in the forthcoming year.

The following innovations were eliminated from this year's EA Hype Cycle:

- **Agile architecture:** *Low rate of relevance to enterprise architects.* The shift from project to product has caused EA to evolve; making the modern EA practice both adaptive and situational, thereby simultaneously leveraging three different styles of EA — big design upfront, product architecture techniques and agile architecture — to solve complex business problems. In other words, modern EA practices focus on not just one, but three different styles of EA to deliver business outcomes.
- **Digital ethics:** *Stalled development.* The ambiguous nature of digital ethics makes it a moving target due to confusion around society's expectations. This makes it hard to operationalize, and the supporting technologies enabling digital ethics are nascent and need to mature further.
- **Digital business technology platform:** *Low rate of adoption.* These platforms are complex and challenging. There is no specific market or vendor for a base platform suitable for building digital use cases and data assets. Companies need to assemble components and tools from generally available cloud frameworks, a cluttered market of IoT vendors, public and private APIs, and other IT assets. Many organizations lack the skills to implement and manage this technology.
- **EA as a service:** *Low rate of adoption.* Hype surrounding EA as a service has quieted down, largely because a lack of clarity among potential users has resulted in lower than expected adoption. We have therefore removed the innovation from the Hype Cycle to make way for more imperative innovation profiles, but we will continue to monitor it. (For current insights on EA as a service, see [Quick Answer: How Can Organizations Succeed With Enterprise Architecture as a Service?](#))

In addition, we changed the names of two innovations from the 2022 Hype Cycle. "Business ecosystems" is now "business ecosystems modeling," and "design thinking" is now "digital design." We did this to best reflect the evolution of the respective innovations.

On the Rise

Customer Technology Platform

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

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Embryonic

Definition:

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

Why This Is Important

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

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

Business Impact

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

Drivers

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

Obstacles

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

User Recommendations

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

Gartner Recommended Reading

[Enable Great Customer Experiences Using Gartner's Customer Experience CORE Model](#)

[Drive Your Customer Experience With a CTP Reference Architecture Model](#)

[Improve CX With a Customer Technology Platform Reference Architecture Model](#)

[Video: How to Build Your Customer Technology Model](#)

[Quick Answer: How to Get Started With the CTP Reference Architecture Model for CX CORE](#)

Autonomic Systems

Analysis By: Erick Brethenoux, Nick Jones, David Cearley

Benefit Rating: Transformational

Market Penetration: Less than 1% of target audience

Maturity: Embryonic

Definition:

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

Why This Is Important

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

Business Impact

Autonomic systems excel where:

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

Drivers

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

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

Longer-term drivers include:

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

Obstacles

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

User Recommendations

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

Sample Vendors

Adaptix; IBM; Latent AI; Playtika; Vanti

Gartner Recommended Reading

[Top Strategic Technology Trends for 2022: Autonomic Systems](#)

Democratized Architecture

Analysis By: Philip Allega, Ian Reynolds, Alana Nolan

Benefit Rating: Moderate

Market Penetration: Less than 1% of target audience

Maturity: Emerging

Definition:

Democratized architecture is a term that references the direct and indirect support provided to business-led digital investment and distributed delivery, whether done by those inside or outside the company. The support takes the form of guidance that shapes the selection, creation, implementation and management of digital investments made outside the IT department.

Why This Is Important

Forty percent of boards have moved more funds into business functions for digital investments (see [EA Function Primer for 2023](#)). Additionally, 41% of employees outside IT are “business technologists” who produce technology or data solutions themselves (see [Quick Answer: Who Are Business Technologists?](#)). This digital democratization is positive, but also risks fragmentation and inefficiencies. Enterprises need a framework to enable coordination that supports local needs and protects shared goals.

Business Impact

Enterprises are embracing democratized digital investment and delivery to improve speed, adaptability, customer centricity and co-created innovation. Yet mismanaged democratization can lead to cost inefficiencies, inconsistent customer experiences, compliance and security vulnerabilities, low integrability and scalability, and low quality of solutions.

Drivers

Democratized architecture has moved to the Innovation Trigger and we’ve shifted it from embryonic to emerging because of the following drivers:

- Gartner client inquiry shows a 106% increase in interest in “democratization” and the concept of IT that is “democratized” from 2021 to 2022.

- Using the current run rate of inquiries through 31 March 2023, we can anticipate a further jump of 33% in 2023.
- Low gross numbers suggest that clients focused upon enterprise architecture are not embracing it, but a growing number know that this is occurring even if they haven't acted.
- The mean proportion of enterprise IT spend done outside the formal IT function is 28.4% of all IT spend within an organization.
- Sixty-seven percent of CEOs and senior business executives want more technology work done directly within business functions or departments and less done in IT.
- Seventy-three percent of managers outside of IT want more technologists on their own teams immediately or in the near future (see [Quick Answer: Who Are Business Technologists?](#)).
- Gartner data shows that four out of five individuals building new digital capabilities today work in business areas, not IT departments (see [Engage Business Technologists to Support Digital Business Acceleration](#)).
- The most important reason that leads to a business-led digital solutions transition to the IT function is that the "solution becomes mission-critical either to the business unit or enterprise."
- Only 33% of CIOs and technology executives rate the success of digital delivery outside the IT organization or function as either very or extremely successful.

Obstacles

- Business partners often view architectural guardrails as bottlenecks. Local teams lack incentives to coordinate with other teams or with EA when making digital decisions. EA teams must demonstrate how making informed architecture decisions within guardrails can create mutually beneficial synergies across teams.
- Some EA leaders still disapprove of business-led digital decision making and try to govern every decision. Given capacity constraints and growing volumes of business-led digital decisions, this approach is unsustainable. EA must triage its engagement, based on where EA can add the most value and on each decision's potential, to impact others across the enterprise.
- A portfolio of inflexible, monolithic enterprise applications can inhibit enterprise teams' ability to meet local teams' needs. EA must help rearchitect the portfolio for composability — a design approach that partitions systems into modular building blocks, enabling easy configurability and greater adaptability.

User Recommendations

- Maximize team- and enterprise-level outcomes by developing a democratized architecture framework with three interrelated architecture layers. These include a core set of reusable platform services; a minimum viable set of architecture guardrails with common technology standards, design patterns, principles and policies; and a shared community architecture that enables stakeholder collaboration and alignment.
- Shift the EA practice to be an internal management consultancy. Accept that not all business-led digital decisions need be governed equally, and offer an array of consulting services to meet varying stakeholder needs.
- Coordinate across layers. Coach business and IT teams to collaborate by socializing the principle of mutually beneficial decision making. Within a shared architecture framework, this helps minimize risks and maximize outcomes for local teams, adjacent teams, and the enterprise.

Sample Vendors

Accenture; Cognizant; Deloitte; Enterprise Architecture Solutions; Infosys; McKinsey & Company; PwC

Gartner Recommended Reading

[Predicts 2023: Enterprise Architecture Charts New Path for Postdigital Era](#)

[Quick Answer: How Must EA Governance and Assurance Change to Support Product Management?](#)

[Case Study: Prioritizing EA Support for Business-Led Architecture \(Maersk\)](#)

[EA's Role in Supporting Fusion Teams](#)

[EA's Role in Product Line Management](#)

Minimum Viable Architecture

Analysis By: Austin Steinmetz, Andrew Gianni

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Embryonic

Definition:

Minimum viable architecture (MVA) is a standardized framework used to ensure the timely and compliant development and iteration of products. It refers to the set of minimal architecture deliverables needed to support business outcomes that serves as a compliance baseline against which agile delivery teams develop products. It is not fixed, and it evolves with the changing needs of the stakeholders and what they learn via iterative product development.

Why This Is Important

Digital capabilities are increasingly being designed and delivered by multidisciplinary distributed teams (see [Fusion Teams: A Proven Model for Digital Delivery](#)). Forty-one percent of employees in an enterprise can be described as business technologists (see [Top 2022 Tech Provider Trend: Composable Business](#)). Democratization is increasing with decision making distributed across fusion teams. A shared architecture that allows different parts of the enterprise to collaborate is required to avoid silos.

Business Impact

MVA business impacts include:

- Helping organizations balance autonomy and alignment with shared architecture that is consumable, composable, consistent and reusable.
- Minimum viable is an adoption threshold aligned to customer priorities to make it worthwhile. Hence, MVA improves customer centricity and accelerates the delivery of targeted business outcomes.
- Co-creating the MVA brings various stakeholders together in fusion teams, helping build a more-collaborative organizational culture.

Drivers

- The hype around MVA is increasing steadily, fueled by the complexity of decision making and coordination in democratized organizations. Gartner client inquiries related to “minimum viable architecture” increased by 71.4% between April 2022 and April 2023, versus the prior 12-month range.
- MVA succeeds where traditional, heavy-handed EA processes and guidance fail to support the swift decisions needed to deliver speed to value through iterative methods (e.g., design thinking and agile).
- EA, often perceived as a bureaucratic and an unnecessary impediment, increasingly faces resistance from product teams. Developing an MVA requires close collaboration with product delivery teams and product lines through stronger relationships with product management.
- Postpandemic, the shift from traditional to digital organizations has accelerated, focusing on innovation and adaptability. MVA, which is not fixed and can be augmented with evolving stakeholder needs, is well-suited to helping organizations rapidly transform and support experimental innovation methods.
- The pressing need for enterprise alignment, business agility and responsiveness is fueling the adoption of MVA.

Obstacles

- The misperception that EA is not needed with agile methodologies is strengthened by EA practitioners that enforce design choice, outweighing local and emergent choice.
- Traditional architect roles have an enterprisewide scope with a strategic focus or a local scope with an implementation focus. To create an MVA with such a balance, a hybridized product architect role must be embedded in product lines.
- Aligning silos of products requires communications and networking skills rarely found in architects, to build trust and maintain relationships with stakeholders, such as product owners, debt leads and innovation leads.
- MVA needs to be developed collaboratively via such forums as a community of practice (CoP). However, these forums often fail to mandate participation. Motivating members to participate voluntarily often requires culture hacking.
- Misunderstanding MVA as equivalent to all facets of EA is an obstacle to EA success. All facets of EA contextually guide the development of MVA.

User Recommendations

- Develop and update the enterprise's MVA collaboratively by working with product owners and through a CoP, and by giving representative members of product teams voting rights and opportunities to share their challenges and feedback.
- Ensure that the MVA eliminates technical debt; is scalable; conforms to enterprise standards, patterns and designs; and is reusable. Deliverables include reference architecture components, standards, principles and product line design patterns.
- Help the enterprise find the right mix between enterprise risk and agility. Step up and communicate key EA positions to business and IT leaders to get buy-in, and mandate for the MVA.

Gartner Recommended Reading

[Quick Answer: How Must EA Governance and Assurance Change to Support Product Management?](#)

[Quick Answer: What Is Meant by Minimum Viable?](#)

[Adaptive EA Governance: 4 Styles That Enable Digital Delivery](#)

[Predicts 2023: Enterprise Architecture Charts New Path for Postdigital Era](#)

[Quick Answer: How Can We Position the Architecture Review Board for Success?](#)

[Ignition Guide to Building Reference Architectures for a Composable Business](#)

Business Design

Analysis By: Marcus Blosch, Saul Brand

Benefit Rating: Moderate

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Business design is an enterprise architecture service that focuses on the development of business and operating models, and their associated components. Business design uses combinations of business architecture deliverables to work with business stakeholders in order to help them frame and execute their business outcomes.

Why This Is Important

As its starting point, business outcome-driven EA takes the business and the outcomes it drives. Enabling the definition and execution of business outcomes is a key value proposition of the EA practice. Business design offers a way of working suited to the needs of business stakeholders. It is supported by a set of appropriate models and deliverables that are provided by business architecture.

Business Impact

IT leaders are exploring business design because its potential business impacts include:

- Providing executives and teams with the expertise and support they need to shape and drive business outcomes
- Leveraging standard business architecture deliverables and techniques to provide insight and analysis about business outcomes
- Bridging business and IT, bringing together expertise from both domains to deliver business outcomes

- Creating a competitive advantage for the organization

Drivers

- Business architecture remains an important topic, with interest remaining steady. Between April 2021 and April 2022, Gartner saw a small 2.4% year-over-year decline in the number of client inquiries.
- The “democratization” of digital innovation shifts it from the IT organization and into the business — for example, through the use of product and fusion teams. Business design complements and supports these teams, helping them to be successful.
- There is increased emphasis on adaptability and resilience in business and operating models, and a need for organizations to change quickly and continuously. Business design centers on the design and delivery of business and operating models that embody “composable” design principles.
- Enterprise leaders continue to emphasize a customer-centric focus, and the need to design services tailored to customer needs. Business design encompasses a design thinking approach to service design that is well-suited to drive customer centricity for enterprises.
- Innovating business and operating models with technology remains a key focus for many organizations. Business design provides the models and methodologies needed to identify the opportunities of technology and test them to find those worthwhile pursuing.
- CIOs and IT organizations increasingly recognize the need to support their business colleagues by providing services designed to support their needs and deliver their outcomes. Business design is a key service tailored to business stakeholders.

Obstacles

- The credibility of the IT organization and EA practice from the perspective of business stakeholders is a major hurdle to the adoption of business design. In many cases, the IT organization and EA practice are seen as having little or nothing to add to the business conversation.
- The competencies of the EA practice to deliver complex forms of business architecture are often limited (i.e., value streams, financial analysis, business model design, etc.). Business design may call for new competencies to be brought into the EA practice to meet these needs.
- EA practice members often lack the ability to work as internal management consultants; they particularly tend to lack the necessary business and behavioral competencies (e.g., relationship management, communication skills and coaching).

User Recommendations

- Redefine the EA practice as a form of internal management consultancy that offers a portfolio of services to suit the needs of its stakeholders.
- Do an analysis of business stakeholders to identify their areas of responsibility, the outcomes they are driving and the challenges they need help with.
- Develop a business design service tailored to the needs of your business stakeholders. This may include deliverables such as capability-based planning, service design and business process analysis.
- Take the time to “sell” the service to business stakeholders. Help them understand what business design is, how it can add value to them and where they can begin. Start with an “early adopter” — a leader who is more open-minded and willing to give business design a try. Create quick wins, gain experience and extend the approach.

Sample Vendors

Ardoq; Avolution; Bizzdesign; BOC Group; Capsifi; LeanIX; MEGA International; Orbus Software; QualiWare; Software AG

Gartner Recommended Reading

[Enterprise Architects Combine Design Thinking, Lean Startup and Agile to Drive Digital Innovation](#)
[Tool: Business Architecture Activities and Deliverables Close the Strategy-to-Execution Gap](#)
[Use Value Streams to Design Service and Operating Models and Enable Application Composability](#)
[Design a Better Digital Business With the Business Architecture Landscape](#)

AI Engineering

Analysis By: Kevin Gabbard, Soyeb Barot

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

AI engineering is foundational for enterprise delivery of AI solutions at scale. The discipline unifies DataOps, MLOps and DevOps pipelines to create coherent enterprise development, delivery (hybrid, multicloud, edge), and operational (streaming, batch) AI-based systems.

Why This Is Important

The potential value of AI has led to huge demand to rapidly launch market-ready AI solutions. This is a big engineering challenge. Most enterprises still struggle to move individual pilots to production, much less operate portfolios of AI solutions at scale. Establishing consistent AI pipelines enables enterprises to develop, deploy, adapt and maintain AI models (statistical, machine learning, generative, deep learning, graph, linguistic and rule-based) consistently, regardless of environment.

Business Impact

AI engineering enables organizations to establish and grow high-value portfolios of AI solutions. Most AI development is currently limited by significant operational bottlenecks. With AI engineering methods — DataOps, ModelOps and DevOps — it is possible to deploy models into production in a structured, repeatable factory-model framework to realize significant value.

Drivers

- Intense hype surrounding generative AI solutions is increasing the overall demand for AI-powered solutions.
- DataOps, ModelOps and DevOps provide best practices for moving artifacts through the AI development life cycle. Standardization across data and model pipelines accelerates the delivery of AI solutions.
- The elimination of traditional siloed approaches to data management and AI engineering reduces impedance mismatch across data ingestion, processing, model engineering and deployment, which inevitably drift once the AI models are in production.
- AI engineering enables discoverable, composable and reusable AI artifacts (data catalogs, code repositories, reference architectures, feature stores, model stores, etc.) across the enterprise context. These are essential for scaling AI enterprisewide.
- AI engineering makes it possible to orchestrate solutions across hybrid, multicloud, edge AI or IoT.
- Broader use of foundational platforms provides initial success at scaling the production of AI initiatives with existing data, analytics and governance frameworks.

Obstacles

- Sponsorship for foundational enterprisewide AI initiatives is unclear.
- AI engineering requires simultaneous development of pipelines across domains.
- AI engineering requires integrating full-featured solutions with select tools, including open-source technologies, to address enterprise architecture gaps with minimal functional overlap. These include gaps around ETL stores, feature stores, model stores, model monitoring, pipeline observability and governance.
- AI engineering requires cloud maturity and possible rearchitecting, or the ability to integrate data and AI model pipelines across deployment contexts. Potential complexity and management of analytical and AI workloads alongside costs may deter organizations that are in the initial phases of AI initiatives.
- Enterprises often seek “unicorn” experts to productize AI platforms. Few vendors provide AI engineering capabilities, making such skills hard to find. Enterprises often have to build and support these environments on their own.

User Recommendations

- Establish a leadership mandate for enterprisewide foundational AI initiatives.
- Maximize business value from ongoing AI initiatives by establishing AI engineering practices that streamline the data, model and implementation pipelines.
- Simplify data and analytics pipelines by identifying the capabilities required to operationalize end-to-end AI platforms and build AI-specific toolchains.
- Use point solutions sparingly and only to plug feature/capability gaps in fully featured DataOps, MLOps, ModelOps and PlatformOps tools.
- Develop AI model management and governance practices that align model performance, human behavior and delivery of business value. Make it easier for users to adopt AI models.
- Leverage cloud service provider environments as foundational to build AI engineering. At the same time, rationalize your data, analytics and AI portfolios as you migrate to the cloud.
- Upskill data engineering and platform engineering teams to adopt tools and processes that drive continuous integration/continuous development for AI artifacts.

Sample Vendors

Amazon Web Services; Dataiku; DataRobot; Domino Data Lab; Google; HPE; IBM; Iguazio; Microsoft

Gartner Recommended Reading

[Top Strategic Technology Trends for 2022: AI Engineering](#)

[Demystifying XOps: DataOps, MLOps, ModelOps, AIOps and Platform Ops for AI](#)

[A CTO's Guide to Top Artificial Intelligence Engineering Practices](#)

[Cool Vendors in Enterprise AI Operationalization and Engineering](#)

[Cool Vendors in AI Core Technologies – Scaling AI in the Enterprise](#)

Operational Experience

Analysis By: Tim Nelms, Jason Wong

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

Operational experience (OX) is a strategy that emphasizes the role of business operations in delivering better business outcomes. It focuses on improving business operations in areas like finance, sales, marketing, supply chain, manufacturing, R&D and legal by creating experiences designed for operational roles and value streams. OX interlinks with customer experience (CX) and employee experience (EX) to incorporate business operations that might otherwise be missed in a total experience program.

Why This Is Important

Operational excellence ranks consistently as the top digital investment priority for CIOs, according to the 2023 Gartner CIO and Technology Executive Survey (see [2023 CIO and Technology Executive Survey: A Process Manufacturing Perspective](#)). However, CIOs lack a cohesive strategy for improving business operations and delivering operational excellence. We predict interest in OX will rise over the next 5 to 10 years triggered by focus on low-code/no-code, efficiencies driven by general AI, the need to retain operational talent, investments in operational excellence and responses to recessionary forces.

Business Impact

Despite being a key factor in delivering experiences for customers and employees, business operations or “the back office” are commonly overlooked in total experience (TX) initiatives. Instead, investments focus on CX and/or EX. However, without balanced investment, business operations like customer support, supply chain and logistics TX initiatives can fail to deliver expected outcomes. The benefits of getting it right are high, with operational excellence, employee satisfaction and better TX all being outcomes of an OX strategy.

Drivers

- Investments in business operations are often framed in terms of efficiency and cost reduction, rather than the experiential outcomes of customers or employees. Connecting investments in CX and EX with operational excellence creates a more balanced TX program and drives whole business outcomes.
- Employees in operational roles in legal, supply chain, HR, finance and other professional roles encounter significant friction — digital and otherwise — that impact their day-to-day experience. Business operations are demanding higher quality experiences.
- As economies flirt with recession, business leaders will need to make their organizations more efficient with fewer employees. Business leaders seeking improvements in business operations should use OX as a strategy for doing more with less.
- CEOs and CIOs must act to retain individuals in key professional roles. OX provides a strategy for improving experience for highly qualified professionals in business operations and retaining them, avoiding replacement.
- Operational excellence is cited by CIOs and technology leaders as a key priority, but leaders lack clear strategies for achieving this goal. OX is an umbrella for a broad range of human, digital and physical strategies for delivering operational excellence, including organizational analysis/design, business process analysis/engineering and UX analysis/design.

Obstacles

- A narrow focus on digital solutions can impact OX initiatives, which instead need to consider the human, digital and physical aspects of business operations. OX looks at the broad range of factors impacting business operations and potentially causing friction, which ultimately lead to poor CX and poor EX.
- Investments in CX are easier to justify by decision makers, because of the correlation between customer satisfaction and revenue. The business case for OX is often more difficult to correlate with measures of business performance. For example, what impact does an improvement in R&D, legal, manufacturing or marketing operations have on TX?
- Business operations often rely on packaged applications that are poorly integrated with modern workplace tools and create friction and frustration for users. A lack of human-centered design in business applications is holding back better operational experiences.

User Recommendations

- Frame investments in business operations through the lens of OX and TX. This gives context for business leaders who must consider and balance investment across these areas.
- Raise the profile and importance of back-office business operations by using OX to balance investments with those in CX and EX.
- Use operational excellence to drive conversations about business change with back-office functional business leaders, and use OX as a program for delivering transformation and change to customers and employees.
- Identify where friction occurs in existing business operations, typically between or across functions, that are affecting operational excellence, and prioritize high-friction, high-value use cases.
- Select vendors based on their fit with specific operational business processes, with operational experiences tuned to the needs of the operational business users.
- Modernize your portfolio of applications and technology for OX in the same way that CX and EX portfolios are managed for delivering business outcomes.

Sample Vendors

OpenText; Salesforce (Slack); SAP

Gartner Recommended Reading

[Innovation Insight for Operational Experience](#)

[Top Strategic Technology Trends for 2022: Total Experience](#)

[Content Services Strategy: Through the Lens of Experience](#)

Business Ecosystem Modeling

Analysis By: Ian Reynolds, Auria Asadsangabi

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

A business ecosystem model is a dynamic network of entities that interact to co-create and exchange sustainable value for participants. Business ecosystem modeling focuses on extending the scope of business architecture to the customers, suppliers, devices, partners and other entities that make up an organization's ecosystem.

Why This Is Important

All organizations exist in business ecosystems that include customers, partners, competitors, regulators, suppliers and other entities. The business ecosystem is made up of a complex set of relationships, roles and dynamics. Ecosystem modeling can provide insight into a business ecosystem and its dynamics, and aid in developing effective business strategies.

Business Impact

Although organizations have always existed in business ecosystems, the digital age has accelerated the complexity and the number of connecting relationships between participants. Business ecosystems now extend around the globe, mediated by technology, and many business models are based on business ecosystems. Business ecosystem modeling enables organizations to better understand and operate within their ecosystem.

Drivers

- Business strategy in a digital era increasingly relies on adopting an ecosystem mindset to ensure organizations are maximizing value realization from ecosystem opportunities.
- Business ecosystems are, by nature, complex adaptive systems. Effectively modeling them enables decision makers to play out scenarios and shape more-sophisticated strategies.
- Business ecosystems facilitate trust-based partnerships and enable open innovation – using the resources of partner organizations and building them into the organization's business and operating model.
- Advancements in technology have helped forge new, and develop existing, interconnections between organizations and their macro environment. Ecosystem modeling helps organizations understand the nature and dynamics of these interconnections.

Obstacles

- Business ecosystems represent a substantial change in perspective, away from zero-sum thinking toward a positive-sum perspective.
- New skills, competencies and tools are needed to model and understand the dynamics of the business ecosystem. This is particularly important as the volume of inputs into the model increases and makes understanding ecosystems more complex.
- Data science, simulation and statistical analysis are all complementary skills for more advanced ecosystem modeling, but they are in short supply.
- Some modeling tools are available, but they are not fully mature and lack widespread adoption and understanding.

User Recommendations

- Begin by learning how organizations have used business ecosystem modeling to optimize and transform their operations.
- Use business ecosystem modeling to identify the participants, their roles, their relationships and their interrelationships. A business ecosystem model can highlight monetization opportunities, threats and challenges.
- Foster a mindset shift among enterprise leaders, promoting openness toward modeling and engaging with the organization's business ecosystem.

Sample Vendors

Avolution; Bizzdesign; Inlecom; Tr3Dent; WorkSpan

Gartner Recommended Reading

[Model Your Ecosystem to Identify the Partners Needed for Digital Business](#)

[EA's Evolving Role in Digital Business Ecosystems: Benchmark Data](#)

[Case Study: An Ecosystem Lens Optimizes End-to-End Customer Journeys \(Premera Blue Cross\)](#)

[Case Study: Methods to Build Trust-Based Ecosystem Partnerships to Optimize Business \(RubyMeadow*\)](#)

[Case Study: Ecosystem Modeling Workshops to Develop Partnerships \(Standard Bank Group\)](#)

Decision Intelligence

Analysis By: Erick Brethenoux

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Emerging

Definition:

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

Why This Is Important

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

Business Impact

Decision intelligence helps:

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

Drivers

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

Obstacles

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

User Recommendations

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

Gartner Recommended Reading

[Innovation Insight for Decision Intelligence Platforms](#)

[Reengineer Your Decision-Making Processes for More Relevant, Transparent and Resilient Outcomes](#)

[How to Choose Your Best-Fit Decision Management Suite Vendor](#)

[AI Security: How to Make AI Trustworthy](#)

[Top Strategic Technology Trends for 2023: Adaptive AI](#)

Product Architecture

Analysis By: Andrew Gianni, Akshay Jhawar

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Emerging

Definition:

Product architecture refers to the practices and associated artifacts that support the strategy and implementation of specific products or services. These are delivered by multidisciplinary product teams that continuously enhance and innovate. It entails providing guidance to inform high-level initial product strategies, influencing emergent product architecture, supporting tactical implementation over the course of the product life cycle, and ensuring cross-enterprise coordination.

Why This Is Important

Supporting the shift to product management and agile product delivery requires rethinking the organization, practices, and skills of enterprise and solutions architects. The emerging role of product architect is essential to support informed, coordinated decision making, and outcomes within and across products and product portfolios, from strategy through implementation.

Business Impact

Many organizations have adapted their IT operating models in response to the shift from point-in-time projects to sustained product delivery. As a result, organizations are rethinking the activities of enterprise, applications and solutions architects. Organizations must define the roles and activities of modern product architects, which requires a mix of enterprise architecture and solution architecture skills and support, for both product-level and panenterprise outcomes.

Drivers

- Between April 2022 and April 2023, Gartner EA analysts saw inquiries related to shifting from project to product management more than doubled, compared with the previous year.
- The implementation and use of a product-centric delivery model continues to grow. As per the 2020 Gartner Application and Product Leadership Changes Survey, a product-centric model was used for an average of 35% of work in 2020. This number is expected to double by 2024 to 70%. Organizations need guidance on how to adapt architecture skills and practices for product-centric delivery.
- Product architecture is needed in product-focused business models to support product line leaders and product portfolio managers to make many of the organization's critical decisions. Supporting these decisions architecturally leads to a more adaptable and resilient enterprise, and an overall alignment to enterprise strategy.
- The benefit of product architecture is high, because it gives product portfolio, as well as product managers and product teams, more autonomy to make decisions quickly, as they face fewer bottlenecks caused by traditional plan-build-run silos. However, there is also a risk of these stakeholders making decisions that are inconsistent with enterprise-level objectives or that lack coordination with other products. Product architecture provides a balance to this risk by providing a structure for consistent decision making across products.
- Organizations must evolve traditional architecture roles, skills and practices to product-centric delivery, and ensure that product and portfolio managers and their teams receive adequate guidance and support, from product strategy through execution.
- There is also a significant need to ensure coordination across product lines and alignment with panenterprise objectives. This has led, in many cases, to the creation of a hybrid product architecture role that blends these two disciplines.

Obstacles

- **Sourcing product architecture skill sets:** Architecture roles are traditionally either cross-cutting and strategic (i.e., enterprise architecture) or more localized and tactical (i.e., solutions architects). Increasingly, these roles must evolve into more hybridized product architect roles that are simultaneously strategic and tactical, and balance local and enterprise goals.
- **Building relationship capital and trust to advise on product decisions:** Product architects must influence product portfolio managers and teams on product strategy and foster understanding of how various design decisions create risks or opportunities. However, they must support product-level objectives, cross-product and panenterprise goals — a balance that can be hard to strike.
- **Ensuring architectural coordination across product silos:** New practices to drive coordination (e.g., orientation around business capabilities and customer journeys, architecture CoPs) are necessary, but can take time to fully establish.

User Recommendations

- Assess existing architects and delivery team members for fitness for a product architect role to identify and address skills gaps. For some, this may be a stretch role (e.g., most solutions architects need soft skills and business architecture training.)
- Align product architects organizationally to product lines or product portfolio owners, while ensuring their participation in the broader architecture community.
- Equip product architects to guide product-level strategies and implementation.
- Support cross-enterprise coordination by working across product teams to identify interdependencies, synergies and reuse opportunities.
- Instill an architecture-oriented mindset within product teams (via learning opportunities, self-service toolkits, etc.) to support more informed, autonomous decisions.
- Adopt emergent architecture documentation practices that support both the product team and other enterprise stakeholders.

Gartner Recommended Reading

[EA's Role in Product Line Management](#)

[Quick Answer: How Can Enterprise Architecture Support Product Management?](#)

[Quick Answer: How to Document Product Architecture](#)

[Enterprise Architecture Adapted for Product Lines \(The Hanover\)](#)

[Quick Answer: How Must EA Governance and Assurance Change to Support Product Management?](#)

Value Stream Mapping

Analysis By: Saul Brand, Mike West

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

Value stream mapping is a technique that visualizes and combines sequences of business processes that represent the ways that an enterprise provides end-to-end visibility and customer value, from receiving customer requests to delivering products, services or experience to its consumers. Each step in the value stream cuts across and connects siloed business capabilities and links lower-level and detailed business processes.

Why This Is Important

Over the past decade, business capability models and business process models have become widely used by enterprise architects. However, in the past five years, there has been a shift in focus from projects to products, and a greater emphasis has been placed on democratized or distributed organizational design and customer and employee experiences. As a result, an increasing number of organizations have started to use value stream maps (VSMs) to bridge the strategy-to-execution gap.

Business Impact

Enterprise architects must help plan, design, innovate, orchestrate, navigate and operationalize digital business. Designing products and services that support the operating model is a challenge for many organizations. Enterprise architects can use VSMs to connect the design process with the underlying technology platform in a way that also links business and technology architecture, thereby ensuring that the value created in the software will enhance the value delivered to customers.

Drivers

- The hype around VSMs continues to increase, but at a slower pace. Between April 2022 and April 2023, Gartner saw a 10.4% year-over-year increase in the number of client inquiries concerning value stream mapping. However, this growth rate declined 10% from that between April 2021 and April 2022.
- An increasing number of clients have seen the importance of VSMs and are interested in using VSMs as an integral part of enterprise and business architectures, or using them as part of product management and agile development.
- Gartner's clients show keen interests in VSMs, business capability modeling (BCM) and business process modeling (BPM), and the relations between them.
- The Scaled Agile Framework (SAFe), the leading enterprise agile framework for scaling, strongly recommends understanding and mapping business or product value streams as well as development value streams. The latter is for optimizing and managing software delivery and the former for identifying the actions that need to be taken to improve flow and value delivery to customers.
- After the value stream concept was introduced into the software delivery process, software engineers started to apply it to the processes that their software is designed to support.

Obstacles

- Traditional project and application funding has long targeted improvements in business capabilities from a siloed perspective.
- The greatest challenge that enterprise architects face is knowing why, when and how to use VSMs.
- Enterprise architects often don't understand the relationships between value streams and other key business architecture deliverables that are essential to link business and technology architecture.
- The perspectives of both IT and business leaders are limited, constrained by the functional domain in which they have authority and by their application-centric — rather than customer-centric — views.

User Recommendations

- Know why, when and how to use VSMs to close the strategy-to-execution gap.
- Deliver an end-to-end visualization of the flow of value to the customer through VSM to focus strategy, investment and success metrics around delivering customer value.
- Equip product teams to fine-tune their delivery by using ongoing value stream management to navigate with both leading and lagging indicators.
- Use value streams to guide multiple decentralized agile teams to develop collaborative and consistent insights across functions and to identify optimization opportunities for making decisions.

Sample Vendors

Atlassian; Creately; Edraw; LinearB; Lucid Software; Microsoft; Miro; Panaya; SmartDraw; Visual Paradigm

Gartner Recommended Reading

[Use Value Streams to Design Service and Operating Models and Enable Application Composability](#)

[Ignition Guide to Value Stream Mapping of DevOps Process](#)

[Optimize Decision Making and Business Value Creation by Aligning D&A With Value Streams](#)

[Align D&A With Value Streams to Optimize Decision Making and Business Value Creation](#)

[Market Guide for Value Stream Management Platforms](#)

Journey Maps

Analysis By: Marcus Blosch, Saul Brand

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

A journey map is a visual representation of the steps a customer or employee goes through, and the touchpoints with an organization, to reach a goal. It follows the flow of events and presents, from their perspective, the story of their journey with its highlights and challenges.

Why This Is Important

Good design begins with a deep understanding of the customer and their needs. Designers need to change perspective from that of the organization to that of the customer (internal or external). A powerful way to do that is to tell the story of the customer, from their perspective, and that's where journey maps fit in. By developing rich, detailed journey maps, we can ensure that we have taken the time to fully empathize with the customer at the start of the design process.

Business Impact

As our recent CEO survey shows, a focus on customer satisfaction — along with growth through the design and development of new products and services — remains high priorities for CEOs and senior executives (see [2023 CEO Survey — The Pause and Pivot Year](#)). To deliver both customer satisfaction and growth, customer journey maps will play a key role.

Drivers

- Journey maps remained a popular topic over the last year, with the number of inquiries to Gartner on the topic remaining the same.
- Senior business executives expect a short downturn and are looking to drive growth through the design and delivery of new products and services and a high-quality customer experience. Design approaches are needed that center on the customer, such as customer journey maps.
- Customer behavior is changing at a faster rate than in the past, and organizations need to be able to adapt equally quickly.
- Many organizations are shifting away from “projects” to “products.” This involves using iterative, experimental approaches to developing services and experiences and a focus on the “customer” at the center of the design process. Customer journey maps — and more detailed customer experience maps — are a key model in this approach.
- As responsibility for digital innovation shifts out of the IT organization and into the business (what Gartner terms “democratization”), business teams use methodologies more familiar to them. Many business team members are familiar with customer journey mapping and see it as a “business” methodology.
- Journey maps don’t just help improve customer experience; they also enable more collaborative partnerships and co-created innovation by ecosystem entities.

Obstacles

- While many people are familiar with customer journey mapping, few have a deep understanding of the methodology and how to apply it. Some training and experience is needed to ensure that good quality journey maps are developed.
- Many organizations have yet to make the move to more human-centric design methodologies, and are often stuck in a project/requirements methodology. Customer journey mapping is not just a simple add-on to projects and requirements; it requires a change in the overall design approach, which is often difficult for many organizations.
- The customer journey map must be used by everyone: from the business side to the IT side, the customer's "story" must be a common guide to everyone involved. This requires closer collaboration between different team members from business and IT, and a focus on shaping a story everyone understands. This can be challenging in organizations where business and IT, at a fundamental level, don't understand each other.

User Recommendations

- Provide design teams with training in design thinking and human-centric design to help them understand the theory and practice involved.
- Provide training and guidance in customer journey mapping — it is often helpful to bring in an outside organization with experience in the area to do this training for you.
- Practice developing customer journey maps and telling the "story" from the customer's perspective. Where you can share the journey map with customers and get their feedback, find out what you missed and what you got right.
- Define a high-level design process for your organization, and locate customer journey maps within that process.
- Instead of applying design principles to simple problems at first, what about the recommendation to start out by putting the simplest, shortest journey for which you have the best data into a customer journey map.

Sample Vendors

InMoment; Lucidchart; Microsoft; Qualtrics

Gartner Recommended Reading

[Key Steps to Begin Customer Journey Mapping](#)

[Ignition Guide to Planning and Conducting a Customer Journey Mapping Workshop](#)

[What Should I Know About Journey Maps?](#)

Machine Customers

Analysis By: Don Scheibenreif, Mark Raskino

Benefit Rating: High

Market Penetration: Less than 1% of target audience

Maturity: Emerging

Definition:

Machine customers are nonhuman economic actors that obtain goods or services in exchange for payment. Examples of machine customers include virtual personal assistants, smart appliances, connected cars and Internet of Things (IoT)-enabled factory equipment. Machine customers act on behalf of a human customer or an organization.

Why This Is Important

Currently, there are more internet-connected machines with the potential to act as customers than humans on the planet. We expect the number of machine customers, such as virtual assistants with AI capabilities, to rise over time steadily. Machines are increasingly gaining the capacity to buy, sell and request services. Further, machine customers will advance beyond the role of simple informers to advisors and, ultimately, decision makers.

Business Impact

Over time, trillions of dollars are expected to be in control of nonhuman customers. This will result in new opportunities for revenue, efficiencies and managing customer relationships. Leaders seeking new growth must reimagine their operating and business models to take advantage of this emerging market of billions of machine customers. Organizations that miss this opportunity will be marginalized, just like those retailers who missed the digital commerce wave.

Drivers

- In the next few years, machine customers are expected to become significant players in the retail and consumer industry.
- In the forthcoming years, billions of connected products might have the potential to behave as customers — that is, to shop for services and supplies for themselves and their owners.
- Currently, most machines merely inform or make simple recommendations. However, some machines are emerging as more complex customers. For example, HP Instant Ink is a service that enables connected printers to automatically order their own ink when supplies run low. Also, some Tesla cars already order their own spare parts and Amazon offers its Dash Replenishment Service for a variety of household appliances. Advances in generative AI, and applications like ChatGPT, will accelerate the development and deployment of machine customers. These tools can diagnose and break down complex tasks to make the right recommendations, service requests and other functions.
- In B2B, Datapred uses machine learning (ML) to recommend optimized purchasing strategies and generate related financial risk reports based on commodity, raw material price predictions and organization-specific internal constraints. For example, in the future, an autonomous vehicle could determine what parking garage to take its human passengers to. This decision would be based on criteria such as distance from destination, price, online review score, parking space dimensions and valet options.
- Machine customers have the potential to generate new revenue opportunities, increase productivity and efficiency, improve health and well-being, and enhance the security of physical assets and people.

Obstacles

Machine customers across industries may not reach the Plateau of Productivity for the next 10 years because of:

- **Operating models:** Marketing, selling and serving a machine customer will upend your operating model. A new definition of customer experience (CX) for a machine customer will be needed.

- **Lack of trust:** Humans may not trust the machine customer technology they use to predict, execute and maintain privacy accurately. Conversely, machine customers may not trust the supplier organization to do the same.
- **Fear of machines:** Some humans may initially be uneasy about delegating purchasing functions to machines. Organizations must consider what ethical standards, legal compliance, fraud and risk mitigation are needed to operate in a world of machine customers.

User Recommendations

- Identify specific use cases where your products and services can be extended to machine customers. Initiate collaboration with your chief digital officer, chief data officer, chief strategy officer (CSO), sales leaders and chief customer officer (CCO) to explore the business potential of machine customers.
- Pilot the ideas compiled during the identification of use cases to understand the technologies, processes and skills required to implement machine customers adequately.
- Build your organization's capabilities around digital commerce and AI, especially generative AI, for the next few years. Use APIs and enterprise bots to enable machine customers for low-complexity transactions. Then, extend your organization's capabilities to other facets involved in machine customers processing information to make informed decisions and perform purchase transactions. Alternatively, join other platforms with these capabilities if you don't have the resources to build them yourself.
- Follow examples from organizations such as Amazon, AutoGPT, Google, HP Inc. and Tesla for evidence of capabilities and business model impact.

Sample Vendors

Amazon; Datapred; Google; HP Inc.; Significant Gravitas; Tesla

Gartner Recommended Reading

[Why Machine Customers May Be Better Than Human Customers](#)

[CIOs Can Maximize Product Lifetime Value by Embracing Machine Customers](#)

[Infographic: A Day in Your Life in a World of Machine Customers](#)

At the Peak

Total Experience

Analysis By: Michelle DeClue, Jason Wong

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

Total experience (TX) is a strategy that creates superior shared experiences by intertwining four disciplines: customer experience (CX), employee experience (EX), multiexperience (MX) and user experience (UX). The goal is to drive greater customer and employee confidence, satisfaction, loyalty and advocacy using digital and nondigital techniques.

Why This Is Important

The march toward mobile, virtual and distributed customer and employee interactions has accelerated, making a compelling case for TX adoption. TX is about using technology and interactions to enhance, empower and embolden both customers and employees. Executive leaders must evaluate the intersections between these experiences and increase both customer and employee confidence and lifetime value. It's about how these experiences make the customer and employee *feel about themselves and the decisions they have to make*.

Business Impact

TX is designed to retain and cultivate greater **customer and employee lifetime value**, a calculation based on the longevity of the relationship and the value they bring to the organization. Losing profitable customers can harm the financial position of an organization. Employee lifetime value also has financial repercussions:

- Loss of institutional knowledge and productivity when an employee leaves.
- Impact to existing team members in terms of morale and load management.
- Cost of recruiting, onboarding and training new talent with no guarantee of productivity.

Drivers

- Technology advancements allow greater opportunities to connect across multiple platforms with multiple ways of engagement (voice, gestures, immersion, etc.).
- Edge devices with cloud-based applications have proliferated across multiple organizations and in consumer electronics and vehicles, providing more opportunity to connect and understand employees, customers and the technology data points at a higher level.
- Employees can facilitate better CX through digital solutions, such as giving a discount or promo code, adding additional time to due dates and deadlines, unlocking exclusive content, or providing next best actions.
- Initial investments can be scaled to add external ecosystem partners to increase the long-term value.
- AI can be applied to see how other similar customer issues were resolved and offer the solution to rectify a customer's issue. Machine learning can recognize where gaps are and either refine the process or notify a developer to address the issue. Recurring patterns or orders can be used to identify how to improve products and services, such as with personalized products or most-requested additional services for a venue.

Obstacles

- **Concept:** The TX concept in the early stages of permeating into organizational roadmaps for joining CX and EX initiatives. Some organizations may feel like they've already been doing some aspects of TX. While they may have focused on each of the four disciplines of TX separately, many have not interlinked or aggregated them from a holistic perspective of the multiparty experiences to have seamless and frictionless UX.
- **Ownership:** Ownership over digital employee experience is also unclear in many organizations. Expanding the aperture to the more expansive TX can have knock on improvement effects to EX, which then yields a better CX — not only digitally, but within employee-to-customer interactions.
- **Inertia:** Organizations making it through the disruptions of the last couple of years without drastic changes to the CX may be inclined not to adopt a new TX strategy.

- **Technology:** Even as organizations transform digitally, they still struggle to modernize digital experiences. This prevents them from achieving richer MX customer and employee journeys across multiple devices with multiple touchpoints and modalities.

User Recommendations

- Form a TX fusion team that crosses activity silos by engaging with CX, EX, UX and MX leaders or centers of excellence across your organization. Use intersecting performance plans (such as OKRs), to incentivize interteam cooperation.
- Start small by applying total experience to a single customer or employee journey, to be built upon further in the future. Engage with business stakeholders and product managers by conducting workshops to determine how TX strategy can transform their roles and make the organization more agile.
- Identify critical gaps in customer and employee interactions by encouraging project teams to also consider how to leverage MX and UX initiatives to improve those experience gaps.
- Use TX strategy to determine future-state business capabilities, which, in turn, will drive targeted business outcomes. This should include customer and employee journey mapping.
- Apply TX to close the strategy to execution gap by finding important business opportunities that have been held back by their siloed CX, EX, UX or MX efforts.

Sample Vendors

Deloitte; Qualtrics; Salesforce; ServiceNow; TechSee; Valtech; Zoom

Gartner Recommended Reading

[Achieve Best-in-Class CX Wins Through Total Experience](#)

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

[Tool: Total Experience Scoping Guide](#)

[Case Study: Connect Customer and Employee Journeys to Deliver Superior Experiences \(the LEGO Group\)](#)

Innovation Management

Analysis By: David Cearley, Marty Resnick

Benefit Rating: Transformational

Market Penetration: 5% to 20% of target audience

Maturity: Early mainstream

Definition:

Innovation management is a business discipline that aims to establish a repeatable and sustainable innovation process and culture within an organization. Innovation is defined here as the processes, tools and technologies for the implementation of new ideas that create value.

Why This Is Important

Enterprise architecture (EA) and technology innovation leaders are increasing their focus on technology-driven innovation. CIOs, CTOs and technology innovation leaders need to understand how to develop innovation as a core competency and establish an innovation function. EA is increasingly becoming an internal management consultancy, enabling continuous innovation throughout the organization by supporting and participating in innovation management and related disciplines, such as trendspotting.

Business Impact

Engaging in innovation in a thoughtful and deliberate way can generate substantive value by the discovery of new business opportunities. A managed innovation approach delivers a more effective and efficient process of generating value. Ideas that will have the most impact on the business are actionable and help achieve business outcomes. Ideas may not always result in a new product or process, but may lead to continuous improvement, intellectual property, trademark and/or new elements.

Drivers

- An innovation management function is needed to avoid mistakes and ensure critical steps are not missed and the enterprise makes informed decisions on innovation ideas.
- Program design varies between organizations based on goals and operational context, driving the need for thoughtful program design and use of a variety of innovation techniques for ideation, evaluation and realization of value from innovation projects.
- Technology innovation leaders need to identify and nurture behavior goals and risk models to support a shared and evolving culture of innovation.
- Technology innovation teams are increasingly tasked with facilitating idea generation and evaluation and shepherding innovation projects to successfully scale and realize business value.

Obstacles

Technology innovation leaders need to be intentional and methodical to maximize impact, but the following challenges need to be managed:

- The lack of clear goals and a link to the business strategy undermines support for innovation and can lead to innovation with minimal business impact.
- Cultural barriers and a lack of executive sponsorship and support with adequate resources for innovation stifle idea generation and limit program success.
- Overlooking the inherent risks in transformative or disruptive innovation and an intolerance for any failure undermine participation and buy-in from both IT and the business.
- The lack of a process that can see ideas through from prototyping through implementation leads to innovations that do not scale and are not adopted.

User Recommendations

- Identify the goals and context of the business innovation program before developing detailed processes, and adapt these processes over time. Reimagine business capabilities and processes by using trendspotting as inspiration to provide insights into optimizing or creating new innovative business models.
- Facilitate the processes and practices of innovation by enabling leaders to guide the focus toward innovation and to quickly trigger and elicit great ideas, expose new insights, identify new opportunities, resolve obstacles, remove barriers or speed up decisions.
- Create fusion teams including members of various groups focused on innovation, IT and the business to jointly develop, evaluate and implement ideas.
- Identify “lessons learned” from failed ideas and present them in a positive light to encourage calculated risk taking. Create a culture of innovation by influencing mindsets and methods, leading to a shift in attitudes which translate into activities, behaviors and outcomes.

Sample Vendors

Brightidea; EY; HYPE Innovation; ITONICS; Planbox; Qmarkets

Gartner Recommended Reading

[Market Guide for Innovation Management Tools](#)

[Achieve the Desired Maturity Level Using the Innovation Management Maturity Model and Assessment](#)

[Hype Cycle for Innovation Management Techniques, 2022](#)

[Jump-Start Your Innovation Journey With a Customizable Innovation Framework](#)

Customer Experience

Analysis By: Don Scheibenreif, Saul Brand

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Customer experience (CX) is the customer's perceptions and related feelings caused by the one-off and cumulative effect of interactions with a company's employees, systems, channels or products. It links to CX management: the discipline of understanding customers and deploying strategic plans that enable cross-functional efforts and customer-centric culture to improve satisfaction, loyalty and advocacy.

Why This Is Important

Customer experience is a top 10 priority for most seats at the executive table, and viewed as vital to helping the organization achieve business outcomes. As customer expectations have reshaped themselves faster than organizations' abilities to respond, organizations are realizing that outside-in thinking is required to weather continuous disruption. What started in the early 2000s as a rarity in a handful of B2C industries has gradually spread across many more industries worldwide.

Business Impact

Seventy-four percent of best-in-class CX organizations reported revenue increase from 2019 to 2020, compared to only 54% in trailing CX organizations. Further, 76% of executive leaders see CX as critical to achieving their business objectives. Adoption varies by industry, with 66% of B2C organizations and 75% of B2B organizations at a very low or low level of CX maturity. These trends have led to most organizations increasing their investments in technology for CX improvement.

Drivers

Four primary trends have driven ongoing interest in CX initiatives:

- Fewer forms of differentiation exist on the basis of product or service excellence and operational efficiency, which is driving a greater focus by senior executives on CX as a means of differentiation.
- Greater customer access to information is resulting in a power shift favoring customers over suppliers. The multitude of channels by which customers can have (and share) great and poor CXs compounds a rising customer willingness to switch providers. This has only been amplified by the global pandemic and associated disruptions.

- There is more proof that CX delivers, with case studies and documented evidence of businesses delivering excellent CXs through demonstrable business benefits. For example, the American Customer Satisfaction Index (ACSI) has identified a strong correlation between customer satisfaction and stock performance.
- High-profile examples of CX missteps have surfaced, where dreadful CXs have hurt customer relationships, damaged brand credibility and impacted stock prices.

CX is just past the peak on this Hype Cycle:

- While some organizations have had a CX leader for more than 20 years, the majority of organizations are at lower levels of CX maturity. Additionally, activity in customer engagement technologies like CRM, voice of the customer (VoC) and customer analytics continues to accelerate.
- For those at Level 2 maturity, it will likely take two to five years to get to Level 3 (intermediate) maturity. It may take five or more years for organizations at the lowest level of maturity (Level 1) to reach Level 3.
- Adoption of, and focus on, customer experience should continue to accelerate given the consistent CEO focus on customer-centric strategies to handle the increased uncertainty caused by disruptions and the rise of digital business.

Obstacles

- Many organizations struggle to understand their customers, set a CX strategy and drive a customer-centric culture.
- Organizations with lower maturity lack an understanding of what customers want and need, as well as the ability to listen to the voice of the customer. As the organization matures, the focus shifts to make faster operational decision making in response to this feedback.
- Organizations of low CX maturity tend to not have a CX leader, a central full-time CX team, a CX steering committee, a single CX strategy and a coordinated approach to customer journey mapping. They also have a poor ability to prioritize projects and technology investments to deliver on the strategy. They may not have the will or the budget either.
- Most organizations struggle to break down functional silos to coordinate how they deliver improved experiences. It is challenging to drive an overall culture of CX into processes and decisions further removed from day-to-day customer interactions.

User Recommendations

- Construct a future-state vision of the customer and employee to accelerate the right organizational digital investments.
- Identify and make the right digital investment decisions to improve CX and EX. Identify business and application opportunities that will improve the flow of value to customers and the employees.
- Use business architecture activities to enable the CX and EX fusion teams to link IT efforts to business direction and strategy, close the strategy-to-execution gap, and design and implement a prioritized outcome-driven digital investment roadmap.
- Use design thinking deliverables, such as customer journey maps and service blueprints, to define the services and experiences that meet customer needs. Do the same for employees.
- Use the future-state CX and EX design to determine what needs to change across people, process, technology and information.
- Work with CX and EX fusion teams and the PMO to develop the roadmaps, project portfolios and product backlogs to execute CX and EX initiatives.

Gartner Recommended Reading

[IT Score for Customer Experience](#)

[Survey Analysis: Customer Experience Priorities for IT and Business Technologists, 2021](#)

[CRM Strategy and Customer Experience Primer for 2023](#)

[Infographic: Customer Experience Management Framework](#)

[7 Types of Customer Experience Project](#)

Composable Applications

Analysis By: Yefim Natis, Anne Thomas, Paul Vincent

Benefit Rating: High

Market Penetration: 1% to 5% of target audience

Maturity: Emerging

Definition:

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

Why This Is Important

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

Business Impact

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

Drivers

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

Obstacles

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

User Recommendations

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

Sample Vendors

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

Gartner Recommended Reading

[Becoming Composable: A Gartner Trend Insight Report](#)

[Quick Answer: Who's Who in the Life Cycle of Composable Applications?](#)

[Case Study: Composable Platform Strategy to Drive Business Agility \(Nike\)](#)

[Predicts 2023: Composable Applications Accelerate Business Innovation](#)

[Use Gartner's Reference Model to Deliver Intelligent Composable Business Applications](#)

Sliding into the Trough

Roadmapping

Analysis By: Philip Allega, Marcus Bloesch

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

Roadmapping is a structured method for visualizing interconnected and interdependent items that change over time. Items may include one or more of such things as applications, technologies, business processes, and/or people. It can be limited by focus (e.g., the IT estate, a business capability or the marketplace) and time (e.g., today, yesterday, tomorrow or a combination of all three). Examples may include project, migration, innovation and enterprise roadmaps.

Why This Is Important

Leaders of organizations continuously try to understand the impact of change on their organizations. This helps enterprise architects visualize the connection across layers of change from IT, the organization and into the market in which the company operates. The connection over multiple time horizons supports the visualization of the interdependence of risk and opportunity on investments already in production or in flight and in future scenarios.

Business Impact

A visual roadmap is indispensable in making near-real-time investment decisions. For leaders of complex organizations, resilience and adaptiveness are the hallmarks of success. Volatile, uncertain, complex and ambiguous (VUCA) environments fuel business model transformation and innovative investment. Although many will respond to VUCA concerns, large organizations fund their division of labor via specialists able to make this technique viable. Complex organizations see this as indispensable.

Drivers

During the past year, although Gartner has received a relatively low number of calls on roadmapping, 90% of those received were related to enterprise architecture (EA) and product roadmapping. This suggests the topic may still be new. However, migration and Gantt chart “roadmaps” are common and have been in place for more than half a century. Thus, we are positioning the technique as something well-known and past the hype. We believe that this view, shared here, remains “early mainstream,” given the small number of inquiries on the topic. Technology providers from the EA marketplace and specific best-of-breed tools target the users of these techniques today.

Common, paraphrased inquiries that lead to discussions of roadmapping show drivers calling for roadmapping as a solution. Such inquiries include requests of Gartner analysts to help clients:

- Explain why upgrades or changes to the IT estate are important to non-IT executives who make the investment decisions.
- Illustrate the risks and opportunities that unexpected changes may wreak on the organization, its customers, its employees and the underlying IT estate.
- Indicate the connection of information and technology to business needs, desires and outcomes sought by leaders.
- Discuss who is affected in the organization, because of consolidation opportunities in the IT estate that may save money for IT expenditures and enable process improvement simultaneously.
- Explain the runway required to pivot in support of future innovation opportunities, given changing trends and/or disruptions affecting the organization.

Obstacles

- Grasping the concept of what roadmapping is, beyond migration or Gantt charts, how they are formed and who may use it to make better investment decisions.
- Realizing that this is not a one-time event, requiring an investment in people, time and tools.
- Creating use cases to support investment decision makers beyond single, point-in-time decisions alone.
- Recognizing the importance of tools from a technology provider, which will be needed to support the use cases.

- Failure to visualize the interconnectivity of choice over time, across layers of the organization and into the marketplace in which it exists.
- Limiting proofs of concept (POCs) to productivity tools alone.

User Recommendations

- Determine and label the use cases for roadmapping to aid decision-making activities, including elapsed time, scope and focus, and sources of information to be captured to convey the state of change.
- Create and validate use cases for the consumers of roadmapping.
- Note the clear difference between migration maps, Gantt charts, etc.
- Identify how contextual drivers, management techniques and analytics drive the results to be captured and visually depicted across change layers.
- Identify the sources, creators, maintainers, communicators and consumers of the visualization.
- Speak with vendors about use cases and data sources required to update analytic devices and update visual metadata to draw attention to states of change from previous visual depictions.

Sample Vendors

Accolade; Airfocus; BizzDesign; Jira Software; LeanIX; Orbus; QualiWare; Roadmunk; SharpCloud; Sparx

Gartner Recommended Reading

[Tool: Advanced Roadmapping for Business Architecture](#)

[4 Roadmapping Tactics to Drive Successful Strategy Execution](#)

[Goal Validation Roadmaps \(Timken\)](#)

[Market Guide for Product Roadmapping Tools for Software Engineering](#)

[Build Effective Strategic Roadmaps in 3 Steps](#)

EA Governance

Analysis By: Saul Brand, Marcus Blosch

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Mature mainstream

Definition:

Enterprise architecture (EA) governance refers to those activities that define the 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 (i.e., compliance) efforts focus on ensuring that the agreed-on viewpoints, principles and standards created during the architecture creation process are realistic, realized and adhered to.

Why This Is Important

EA governance helps the organization deliver business outcomes by focusing on orderly and coherent strategy execution. It adds to business value by providing the guardrails and guidance needed to support stakeholder technology investment decision making, and by orchestrating stakeholder involvement and interaction. EA assurance is the formal process of reviewing new and ongoing standards to ensure that they comply with the defined guidance, policies and rules.

Business Impact

The shift from projects to products disrupts the traditional command-and-control style of EA governance and assurance:

- Implementing a product-centric approach typically includes agile, and introduces strategy and operational changes that affect the information and technology (I&T) operating model.
- The shift is causing clients to rethink EA governance's role, and to seek advice on how to rethink EA governance to balance risk and agility, while delivering business outcomes at speed.

Drivers

- Between April 2022 and April 2023, the number of client inquiries Gartner fielded covering EA governance and assurance increased by 3.9%. Clients are seeking advice on how to adopt and implement an agile form of EA governance to accommodate the new EA operating mode. The new EA operating model must support the shift from project to product — the “democratized” and distributed organizational design.
- The shift from projects to products strains traditional EA governance. Distributed product or fusion teams are increasingly creating, procuring and outsourcing their own technologies.
- These changes are prompting EA leaders to rethink how the EA practice supports product management, and how EA governance must adapt to the realities and needs of an expanded pool of stakeholders across the distributed organization.
- EA leaders recognize that “command and control” EA governance practices are no longer fit for purpose. They are adopting an adaptive style of governance that provides guidance, guardrails and support to distributed product teams outside IT and the purview of the EA organization.
- To support distributed and architecturally significant decisions at speed, EA leaders are focusing on democratizing the EA governance process.

Obstacles

- EA governance has traditionally been about “command and control,” which is why it has a bad reputation with business, IT, product and agile teams, and is perceived as a bureaucratic roadblock.
- Many EA practices struggle to overcome the command-and-control past. They recognize the need and aspire to help their organizations architect for agility and resilience — by democratizing the EA governance process. This gives the decentralized organization much-needed flexibility to act with freedom and responsibility. However, EA leaders struggle to implement an adaptive style of EA governance that fully supports product management.
- Adaptive EA governance is complex and must be applied on a maturity, situational and fitness-for-purpose basis. For example, protecting industrial installations or privacy requires a command-and-control-based governance style, whereas accelerating new product development through a digital innovation lab requires an agility-based style.

User Recommendations

- Align EA governance with IT and corporate governance and enterprise risk management so that EA governance shares the same common focus areas: strategy, investments, performance, resources, risk and innovation.
- Support product centricity by replacing one-size-fits-all governance with adaptive governance that contextualizes decision rights, while balancing product needs with enterprise goals.
- Address strategy and business operating model changes by shifting the I&T operating model orientation from service to value, and adjusting its components to increase agility and support product centricity.
- Support distributed and architecturally significant decisions at speed by democratizing the EA governance process.
- Democratize the EA governance process by establishing a community of practice consisting of product teams and the EA practice, constructing a minimum viable architecture that is continuously updated, and empowering product teams with freedom and responsibility through voting rights.

Sample Vendors

Ardoq; Avolution; Bizzdesign; BOC Group; Capsifi; LeanIX; MEGA International; Planview; QualiWare; Software AG

Gartner Recommended Reading

[Presentation: The New EA Operating Model for Digital](#)

[Adaptive EA Governance: 4 Styles That Enable Digital Delivery](#)

[Quick Answer: How Can Enterprise Architecture Support Product Management?](#)

[Quick Answer: How Must EA Governance and Assurance Change to Support Product Management?](#)

[Tool: Architecting the Democratized Organization](#)

Information Architecture

Analysis By: Kevin Gabbard, Andrew White

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Information architecture (IA) is the discipline that formalizes the capabilities needed to analyze and organize the data needed to deliver business value. IA employs design patterns and increasingly active metadata to design emergent state architecture and provide guidance for sharing data assets.

Why This Is Important

Mastery of information architecture practices can define business models and alter an enterprise's competitive landscape. Consistent delivery of business insight requires information capabilities for observation, pattern identification and data sharing. Information architectures must reconcile intentional, as-designed architecture with emergent metadata-driven architecture to enable or drive business value.

Business Impact

CDAOs should be looking to information architecture for:

- Creation of information-centric business models: Monetization of information services and products.
- Strategic decision making: Visibility across the enterprise to make important decisions, which requires investments in common data models and governance.
- Enabling innovation: Access to and use of data are invaluable for enterprises that want to explore data, capture insights and pursue growth opportunities.

Drivers

- Developing a coherent viewpoint across a large number of information silos addresses enterprisewide coordination challenges.
- Active metadata and data fabric design patterns are dramatically changing the economics and work of IA by discovering and exposing established implied taxonomies, useful information assets and as yet unimagined (re)use cases.
- IA practices support the continuous analysis of requirements and enable significant assessment for the evolution of data and analytics (D&A) capabilities maps.

Obstacles

- Although best practices like employing traditional IA design patterns, implementing master data management and delivering common reference artifacts (like information flows) are known, they require long-term commitments to program building, which slows adoption.
- CDAOs and other D&A leaders have not taken accountability for IA, and it is falling into the cracks between traditional IT/CIOs, best-of-breed enterprise architecture (EA) and D&A.
- Successful IA discipline requires the coordination of diverse business and technical domains that may not initially have a consensus view on the strategic importance of information.
- The penetration has remained low because traditional future-state architecture modeling techniques are incapable of accounting for the fast-paced business dynamics surrounding data use.
- Active metadata is underutilized in developing IA. Without active metadata practices, IA will not achieve practical enterprise-scale adoption.

User Recommendations

- Focus as much on reconciling metadata silos as reconciling data silos.
- Dive deep into active metadata and data fabric design patterns. It is the key to developing agile IA practices.
- Clarify what impact information has on the organization's critical business imperatives and set IA requirements. Successful implementation of information-centric initiatives requires collaboration between D&A, IT and EA, including use of business capability models to target investments, build roadmaps, communicate change and deliver projects.
- Use metadata to interpret data user behaviors and anticipate needed solutions.
- Develop data-asset-focused objectives and key results and track progress using quantifiable business key performance indicators (KPIs).
- Explore information-focused business transformation.
- Pilot data monetization efforts.
- Identify potential new information-driven business models.

Gartner Recommended Reading

[Tool: Information Architect Hiring Guide](#)

[Quick Answer: What Is Active Metadata?](#)

[5 Things a D&A Architecture Discipline Does for a CDAO](#)

[Assessing the Relevance of Data Virtualization in Modern Data Architectures](#)

Business Architecture

Analysis By: Saul Brand, Marcus Blosch

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Mature mainstream

Definition:

Business architecture (BA) refers to the activities of creating diagnostic and actionable deliverables to support the development and execution of business strategy, business and operating model design, and the investments necessary to respond to disruptive forces and realize targeted business outcomes.

Why This Is Important

BA is essential for planning and executing digital business, offering key activities and essential deliverables to help business and IT leaders plan and prioritize strategic investments. BA is the starting point for linking IT efforts to business direction and strategy. It provides critical guidance and support to close the strategy-to-execution gap. It addresses the “why” and “what” before executing the “how” of EA. It defines the organization and its operations from a business perspective.

Business Impact

- BA informs and guides a rigorous analysis of the business; its context; and the disruption, threats and opportunities it faces.
- Organizations that utilize BA have a significantly higher ability to make better technology investment decisions and execute on their technology-enabled and data-driven business strategies.
- BA activities and deliverables provide insights that support innovation, business transformation and optimization efforts by building a bridge between strategy and execution.

Drivers

- There is significant hype around BA, and interest remains steady. Between April 2022 and April 2023, Gartner saw a 2.6% year-over-year increase in the number of client inquiries over the same period between April 2021 and April 2022. Many clients are in the process of upgrading and modernizing their EA practice, which most often starts with developing a BA competency and using BA to link all IT efforts to business direction and strategy.
- BA sits at the intersection of business and IT. It offers a set of common tools and techniques to help business and IT leaders plan and prioritize strategic digital investments.
- As more organizations embrace adaptive strategy to ensure competitiveness, their business, operating and service models will change more rapidly. These organizations must quickly deliver innovation by dynamically adapting the operating model and the composable technologies and applications that drive it. To do this successfully, organizations will need BA to drive customer and employee experience, design the composable IT estate, and steer agile.
- Adaptive strategy, operating and service model design requires flexible, modular and composable technical foundations. This requires the construction and combination of key business architecture deliverables — like business capability models, value stream maps, customer journey maps and business process models — to close the strategy-to-execution gap.

Obstacles

- More business stakeholders are making decentralized and product-centric digital investment decisions. This has led to the proliferation of BA deliverables both produced and consumed by business stakeholders, fusion teams and agile teams.
- Often, individuals taking on BA responsibilities and producing BA deliverables are not directly affiliated with a formal EA practice. They have skills and loyalties that are domain-specific. Their domain focus may not be aligned with the enterprise view or perspective. An enterprise view is necessary to plan, design, prioritize and fund strategic IT investments and build a composable IT estate driven by digital platforms.
- Traditionally constructed BA deliverables, such as business capability models, are usually built top-down to support business executives or IT leaders. They need to evolve so that they capture the bottom-up, agile team perspective that is needed to construct deliverables fit for an expanding pool of business and IT stakeholders.

User Recommendations

- Ensure the relevance of BA by integrating that perspective with other enterprise architecture domains.
- Use BA to improve customer and employee experience, not just internal operations.
- Develop a new value proposition for BA by engaging decentralized product teams.
- Engage in conversations with agile teams about the importance of business architecture and business architecture deliverables to guide strategy, drive customer and employee experience and design the composable enterprise and IT estate.
- Use BA to identify where fusion teams are needed to facilitate/communicate shared value drivers between business and delivery teams.
- Work with domain experts on the fusion team and across the organization to ensure the supporting technology platforms are ready to accommodate adaptive strategy and the composable enterprise.
- Calibrate BA skills for market demand. Assess the existing talent pool of business architects' skill sets. Hire new business architects where necessary to close gaps.

Sample Vendors

Ardoq; Avolution; Bizzdesign; BOC Group; Capsifi; LeanIX; MEGA International; Orbus Software; QualiWare; Software AG

Gartner Recommended Reading

[Tool: Business Architecture Activities and Deliverables Close the Strategy-to-Execution Gap](#)

[Design a Better Digital Business With the Business Architecture Landscape](#)

[Follow 5 Steps to Architect Your Enterprise Operating Model](#)

[Use Value Streams to Design Service and Operating Models and Enable Application Composability](#)

[How Enterprise Architects Use OKRs to Deliver Business Outcomes](#)

Knowledge Graphs

Analysis By: Afraz Jaffri

Benefit Rating: High

Market Penetration: 5% to 20% of target audience

Maturity: Adolescent

Definition:

Knowledge graphs are machine-readable representations of the physical and digital worlds. They include entities (people, companies, digital assets) and their relationships, which adhere to a graph data model — a network of nodes (vertices) and links (edges/arcs).

Why This Is Important

Knowledge graphs capture information about the world in an intuitive way yet are still able to represent complex relationships. Knowledge graphs act as the backbone of a number of products, including search, smart assistants and recommendation engines. Knowledge graphs support collaboration and sharing, exploration and discovery, and the extraction of insights through analysis. Generative AI models can be combined with knowledge graphs to add trusted and verified facts to their outputs.

Business Impact

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

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

Drivers

- The need to complement AI/ML methods that detect only patterns in data (such as the current generation of foundation models) with the explicit knowledge, rules and semantics provided by knowledge graphs.
- Increasing awareness of the use of knowledge graphs in consumer products and services, such as smart devices and voice assistants, chatbots, search engines, recommendation engines, and route planning.
- The emerging landscape of Web3 applications and the need for data access across trust networks, leading to the creation of decentralized knowledge graphs to build immutable and queryable data structures.
- Improvements in graph DBMS technology that can handle the storage and manipulation of graph data structures at scale. These include PaaS offerings that take away the complexity of provisioning and optimizing hardware and infrastructure.
- The desire to make better use of unstructured data held in documents, correspondence, images and videos, using standardized metadata that can be related and managed.
- The need to manage the increasing number of data silos where data is often duplicated, and where meaning, usage and consumption patterns are not well-defined.
- The use of graph algorithms and machine learning to identify influencers, customer segments, fraudulent activity and critical bottlenecks in complex networks.

Obstacles

- Awareness of knowledge graph use cases is increasing, but business value and relevance are difficult to capture in the early implementation stages.
- Moving knowledge graph models from prototype to production requires engineering and system integration expertise. Methods to maintain knowledge graphs as they scale – to ensure reliable performance, handle duplication and preserve data quality – remain immature.
- The graph DBMS market is fragmented along three properties: type of data model (RDF or property), implementation architecture (native or multimodal) and optimal workload (operational or analytical). This fragmentation continues to cause confusion and hesitation among adopters.
- Organizations want to enable the ingestion, validation and sharing of ontologies and data relating to entities (such as geography, people, events). However, making internal data interoperable with external knowledge graphs is a challenge.
- In-house expertise, especially among SMEs, is lacking, and identifying third-party providers is difficult. Often, expertise resides with vendors of graph technologies.

User Recommendations

- **Create a working group of knowledge graph practitioners and sponsors** by assessing the skills of D&A leaders and practitioners and business domain experts. Highlight the obstacles to dependable and efficient data delivery for analytics and AI, and articulate how knowledge graphs can remove them.
- **Run a pilot to identify use cases that need custom-made knowledge graphs.** The pilot should deliver not only tangible value for the business, but also learning and development for D&A staff.
- **Create a minimum viable subset that can capture the information of a business domain to decrease time to value.** Assess the data, both structured and unstructured, needed to feed a knowledge graph, and follow Agile development principles.
- **Utilize vendor and service provider expertise** to validate use cases, educate stakeholders and provide an initial knowledge graph implementation.
- **Include knowledge graphs within the scope of D&A governance and management.** To avoid perpetuating data silos, investigate and establish ways for multiple knowledge graphs to interoperate and extend toward a data fabric.

Sample Vendors

Cambridge Semantics; Diffbot; eccenca; Neo4j; Ontotext; Stardog; TigerGraph; TopQuadrant; Trace Labs

Gartner Recommended Reading

[How to Build Knowledge Graphs That Enable AI-Driven Enterprise Applications](#)

[3 Ways to Enhance AI With Graph Analytics and Machine Learning](#)

[Working With Graph Data Stores](#)

[How Large Language Models and Knowledge Graphs Can Transform Enterprise Search](#)

Digital Design

Analysis By: Marcus Blosch, Akshay Jhawar

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

Digital design is a multidisciplinary process used to improve the design of digital products and services. Deep customer insight, combined with a creative process, is ideal for digital innovation. It starts with empathy for users and the gathering of insight about their needs and motivations, developed using an iterative, experimental approach.

Why This Is Important

A proven methodology applied to a broad range of business problems, digital design typically enhances usability and user experience (UX). UX is a key element of the total experience (TX), affecting both the employee experience (EX), customer experience (CX) and operational experience (OX). Leading organizations regularly apply digital design to new digital projects/products, and it can also link to lean startup and agile methodologies, enhancing application development.

Business Impact

Digital strategy and innovation remains a priority for senior business leaders, so digital design will remain a core methodology. The usability of products and services affects key performance indicators (KPIs), such as customer satisfaction, Net Promoter Score (NPS), customer effort score, customer/employee retention, conversion, revenue and market share.

Drivers

- The growing importance of digital engagement with customers and employees has forced enterprises to take design seriously. Design teams, centers of excellence (COEs), user-centered design, usability testing, usability labs and skilled designers are just a few of the efforts made by enterprise IT to improve design. Although they generally work well, a digital design methodology is needed to bring these elements together.
- Digital design has a direct impact on CX and EX, the most significant investment areas for enterprises. Total experience, which ties together the relationship between UX, CX and EX, has become a new focus area for enterprises.

Obstacles

- Experience in digital design will ensure the smooth application of design thinking. Basic training is adequate; however, the pairing of designers and developers is a best-practice model for making digital design work effectively.
- Some digital design workshops are commissioned without a clear objective in mind and without appropriate research. This leads to workshop results that are not actionable.
- Digital design has historically been accomplished by a group of people in the same location, frequently a dedicated space. With COVID-19, these gatherings became nonfeasible, and digital design was forced into a remote-only model. This was challenging, especially for steps such as ideation and prototyping. Today's hybrid work scenarios will allow physical gatherings for design-thinking sessions, but the remote tools employed during the pandemic may be critical when teams include some remote participants.

User Recommendations

- Identify opportunities for the application of digital design to improve usability, especially in new digital projects and product development.
- 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.
- Start simply and on a small scale in most cases. Take on more complex projects progressively as your experience grows.
- Train the cross-functional team in the digital design methodology, emphasizing practical experience of it. Ensure that the workshop objectives are clear, and that appropriate research is done prior to the workshop.
- Develop your design approaches to support hybrid work scenarios. The key elements for supporting a combination of physically present and remote team members are a collection of digital collaboration tools, electronic conference rooms, multiscreen capabilities for individual work-from-home (WFH) workers and the application of DesignOps.
- Continue to evaluate new tools to facilitate remote participants.

Sample Vendors

Accenture; Adobe; IBM; IDEO; JFrog; Massachusetts Institute of Technology; Nielsen Norman Group; Pegasystems; Salesforce; SAP

Gartner Recommended Reading

[Quick Answer: How Can We Incorporate User-Centric Design Into the Features We Build for Our Product?](#)[Enterprise Architects Combine Design Thinking, Lean Startup and Agile to Drive Digital Innovation](#)[Design a Better Digital Business With the Business Architecture Landscape](#)[Design Thinking Improves Customer-Facing Projects \(FedEx\)](#)[Ignition Guide to Conducting a Design Thinking Workshop as a Product Manager](#)

Business Capability Modeling

Analysis By: Saul Brand, Marcus Blosch

Benefit Rating: High

Market Penetration: More than 50% of target audience

Maturity: Mature mainstream

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.

Why This Is Important

Business capabilities form the linchpin that connects business and operating models. BCM is a technique that business and IT leaders can use to organize and visualize which resources can be combined to execute and operationalize business strategy. BCM can be used to flesh out and operationalize an organization's business strategy, communicate that strategy, and demonstrate how people, processes, information and technology resources need to change to achieve desired business outcomes.

Business Impact

- BCM has the most impact when used to design and deliver business and operating models, identify and assess technology assets, find value creation opportunities, and make future business investment and/or change decisions.
- BCM can be used to help draw up a compelling, high-level list of capabilities and business trade-offs that will be immediately understood by business and IT leaders.
- BCM helps decision makers to avoid getting bogged down in political, organizational and technical quagmires.

Drivers

- Use of BCM is high, but the level of new interest in BCM as an essential business architecture activity and essential deliverable has diminished. Between April 2022 and April 2023, Gartner saw that BCM-related client inquiries declined 39% from those between April 2021 and April 2022. This marks a turning point. Over the past decade after BCM became mainstream we saw year-over-year increases in this kind of inquiry. But the growth slowed down over the past four years.
- BCM can bring high benefits because it enables business and IT leaders to engage in business strategy and execution planning, and to understand the impact of their decisions on business, operating, finance, service and information models and the underlying technologies that support them.
- Enterprise and business architects — and IT teams in general — are looking for tools and techniques, such as BCM, that can help them strategically engage with their business counterparts to drive value.
- As organizations progress further with their digital transformation and optimization initiatives, they tend to use BCM to create an anchor model to inform, operationalize and improve customer and employee experiences. This can be accomplished by combining BCM with other key business architecture deliverables such as value streams, customer and employee journey maps, and business process maps.

Obstacles

- Despite widespread interest in and use of BCM, many organizations fail to fully construct and ratify an enterprise BCM initiative. Also, many BCM initiatives fail because their developers fail to construct a value proposition, conduct roadshows, and get a mandate from business leaders.
- Although business executives mostly understand the value of business capability models, many fail to fully grasp the link between business capabilities and underlying IT assets.
- BCM initiatives often go awry because those undertaking them confuse business capabilities with technical capabilities or business processes, or start with generic reference models.
- BCM is best used in a top-down fashion. Agile teams sometimes construct and use business capability models from the bottom up, which only reflects the current state and limits the effectiveness. The bottom-up approach leads to a product/application perspective, which covers only a small part of the bigger enterprise operating model.

User Recommendations

- Engage and influence business leaders, product managers and product owners by discussing the benefits of business capability models — as part of business architecture — as early as possible.
- Maximize the value of BCM by basing it on the evolving business strategy and your organization's future business model.
- Use BCM to represent the intersection between business and operating models and as a platform for creating other diagnostic and action-oriented deliverables. More detailed business capability models can be used to illustrate specific decisions from information, business, solutions and technology architecture viewpoints.
- Combine business capability models with other key business architecture deliverables to identify opportunities, guide strategy, improve customer and employee experiences, and design composable applications and a composable enterprise.

Sample Vendors

Ardoq; Avolution; Bizzdesign; BOC Group; Capsifi; LeanIX; MEGA International; Orbus Software; QualiWare; Software AG

Gartner Recommended Reading

[Tool: Building a World Class Business Capability](#)

[8 Best Practices for Creating High-Impact Business Capability Models](#)

[Toolkit: Workshop for Constructing an Initial Business Capability Model](#)

[Ignition Guide to Creating a Business Capability Model](#)

[Case Study: Interconnected Business Capability Mapping \(Medtronic\)](#)

Digital Twin

Analysis By: Alfonso Velosa, Marc Halpern, Scot Kim

Benefit Rating: Transformational

Market Penetration: 1% to 5% of target audience

Maturity: Adolescent

Definition:

A digital twin is a software-enabled proxy that mirrors the state of a thing, such as an asset, person, organization or process to meet business outcomes. There are three types of digital twins: discrete, composite and organizational. Digital twin elements include a model, data, a one-to-one association and monitorability. Digital twins are built into a range of software: analytics, 3D models, CRM and IoT. Data on the state of the thing must be sourced via telemetry or application state changes.

Why This Is Important

Enterprises are using digital twins to create virtual representations of previously opaque or time-lagged things. Digital twins can help meet business outcomes such as process optimization, improved visibility or new business models. Specific examples include improving supply chain decisions via better supply and demand visibility, and reducing downtime by monitoring equipment state. Tech providers are increasing value by building domain-specific templates and integration to data sources.

Business Impact

Enterprises are implementing digital twins to:

- Gain visibility into things such as equipment or customer state that enable people to make better maintenance or marketing decisions.
- Assess, simulate and reduce the complexities of designing and developing innovative products and new service models.
- Improve patient outcomes, employee safety and customer transactions by using digital twins of people.
- Drive new data monetization models and contribute to product-as-a-service business approaches.

Drivers

- Enterprises are accelerating their adoption of digital twins to support a broad variety of business outcomes. These business outcomes include reducing the cost structure through improved monitoring of assets and optimizing equipment and processes by aligning asset digital twins into a range of solutions, such as predictive analytics and field service management. They also include product differentiation by engaging consumers and controlling assets, and integrating data silos into one central visualization.
- Asset-intensive sectors — for example, oil and gas, transportation, manufacturing and buildings — are leading in using digital twins to optimize business processes such as product development, supply chain and operations.
- Leading OEMs are exploring how digital twins can help add long-term annuity streams to their regular revenue.
- Leading-edge enterprises are implementing digital twins to model book-to-bill status, foreign exchange risk and supply chain processes. They do so to optimize costs and improve processes.
- Technology providers — from large cloud vendors to startups — are identifying potential ways to serve and charge customers using digital-twin-enabling product portfolios. In particular, they are developing template libraries to demonstrate domain knowledge and to shorten time to value for enterprise customers.
- Standards organizations such as IEEE, Eclipse, ITU and consortia (including the Digital Twin Consortium) contribute to establishing digital twin standards, architectures, ontologies and improving visibility.

Obstacles

- Few enterprises understand what they are trying to achieve, let alone the metrics for digital-twin-based projects. This lack of vision limits project scope and investment into new business processes that can take advantage of digital twins.
- Few enterprises have the cross-functional fusion teams — across business, finance, operations and IT — that are required to achieve business outcomes powered by digital twins.
- Digital twins present a technical challenge for most enterprises due to the blend of operational and information technologies required to develop and maintain them.
- Pricing remains an art, and most vendors focus on their technology differentiation, even though customer organizations are looking for business value outcomes when purchasing digital twin offerings.
- Standards bodies remain emergent. Most vendors use proprietary formats. There is a lack of standards for a broad range of digital twin technical areas such as data source and model integration and metadata management.

User Recommendations

- Co-create the digital twin strategy with the enterprise business unit to identify opportunities and challenges and establish clear success metrics. Further, the business must select sponsors and super users, create a budget and build a roadmap that starts small and scales up.
- Avoid digital twin projects that lack a business sponsor as this is key to success. Lack of internal sponsorship will waste IT resources.
- Identify IT organization technology, governance and skills gaps and build a plan to resolve them.
- Protect intellectual property by working with procurement to ensure that digital twin data and custom models belong to the enterprise.
- Develop an architectural, security and governance framework to manage large numbers of discrete digital twins, as well as composite and organizational digital twins.
- Select vendors not just for their technology portfolio, but more importantly, for the intellectual property (IP) they have in your vertical market. The IP should be demonstrated in libraries of prebuilt digital twin precursor models.

Sample Vendors

Akselos; Esri; GBTEC Group; Mavim; Nstream; Sight Machine; Toshiba; TwinThread; Vanti; visCo

Gartner Recommended Reading

[Quick Answer: What Is a Digital Twin?](#)

[Emerging Tech: Tool — Digital Twin Business Value Calculator](#)

[Life Cycle Management of Software-Defined Vehicles: Step 3 — Vehicle Digital Twin 2.0](#)

[Quick Answer: Privacy Basics for a Digital Twin of a Customer](#)

[Emerging Tech: Tech Innovators for Digital Twins — Digital Business Units](#)

Solutions Architecture

Analysis By: Andrew Gianni, Akshay Jhawar

Benefit Rating: Moderate

Market Penetration: More than 50% of target audience

Maturity: Early mainstream

Definition:

Solutions architecture consists of the architecture practice and deliverables that guide the delivery and management of solutions to achieve targeted business outcomes. The practice provides support for individual solutions, as well as coordination across the solution portfolio, often in conjunction with an enterprise architecture practice. Solutions architecture can be differentiated from product architecture in that its focus is generally more tactical and applied in a project-based context.

Why This Is Important

Solutions architecture connects the guidance produced by the enterprise architecture (EA) practice and the implementation work of delivery teams. Without solutions architecture, delivery teams struggle to ensure that their output achieves targeted business outcomes, while controlling business and IT spending.

Business Impact

Solutions architecture allows organizations to:

- Align business and IT solutions with the enterprise target-state architecture.
- Control business and IT spend and architectural complexity by reusing architectural components defined by solutions architecture.
- Benefit from improved collaboration between business and IT stakeholders.

Drivers

- Gartner clients regularly search Gartner's website for information on solutions architecture, with over 4,500 searches executed for the terms "solution(s) architect" or "solution(s) architecture" between April 2022 and April 2023. During the same period, Gartner's solutions architect job description template was viewed nearly 2,400 times.
- Organizations struggle to realize business outcomes through the application of IT due to a gap between business and IT strategy and the activities of delivery teams.
- Solutions architecture helps leaders assess and manage overall business and IT spending by visualizing the risks and opportunities of short-term decisions versus long-term benefits.
- Technology solutions are becoming increasingly complex with embedded AI, hybrid cloud and Internet of Things (IoT) architecture components. Their complexity, in combination with legacy and SaaS application portfolios, requires solutions architecture to shift much of its focus to end-to-end process and technology modeling, value stream mapping and management, and system and service integration.
- Digital innovation is increasingly becoming a priority for many organizations, and solutions architecture must play a more proactive role than a traditional, project-based practice to provide support for agile solution design across distributed teams.

Obstacles

- Solutions architecture practices that are aligned with waterfall methodologies must evolve their structure and services to support agile methodologies, as agile practices are adopted in their organizations.
- A shortage of qualified practitioners in the marketplace challenges organizations to staff their solutions architecture practices.
- The rise of business technologists and fusion teams can lead to uncoordinated architecture decision making, as solutions architecture support is traditionally delivered in a project model within the IT organization.
- Siloed organizations may struggle to create a unified solutions architecture practice that spans and coordinates all domains supported by business and IT.
- Organizations fail to differentiate solutions architecture from application development as an overarching competence. Solutions architecture often is primarily focused on the internal architecture of applications, leading to architecture decisions that don't consider enterprise impact.

User Recommendations

- Internalize knowledge or build relationships with business and IT teams to address the increasing complexity of product, service, and underlying information and application architecture.
- Keep business strategy and outcomes in mind to determine a realistic roadmap in collaboration with strategic portfolio management (SPM) leaders and design solutions that deliver on the roadmap.
- Embrace democratization of solution design by members of agile teams without architect titles, and shift the solutions architects' focus to provide coaching and mentoring, rather than creating designs.
- Co-create an architecture community of practice with EA to support lightweight governance and assurance of distributed decision making by members of agile teams through the creation of a minimum viable architecture.
- Develop an iterative design process based on the creation of a series of architecture decision records that are summarized by a regularly updated set of design diagrams.

Gartner Recommended Reading

[Tool: Solutions Architect Job Description](#)

[Tool: Solution Architecture Document Template](#)

[Quick Answer: How Must EA Governance and Assurance Change to Support Product Management?](#)

[Tool: Competency Model for Enterprise Architecture Talent Management](#)

[Quick Answer: How to Document Product Architecture](#)

Trendspotting

Analysis By: David Cearley, Samantha Searle, Marty Resnick

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

Trendspotting is a purposeful and targeted approach for acquiring and evaluating trends. A trend is an observation or prediction about current and future changes and disruptions that create threats and opportunities. Trendspotting explores changes in technological, political, economic, social/cultural, trust/ethics, regulatory/legal, and environmental areas and is used to inform and enhance strategic planning, operational efficiency and innovation management.

Why This Is Important

Enterprises must continuously scan and respond to changes and disruptions that impact their business. Trendspotting filters, analyzes, contextualizes and brings order to the cacophony of observations and predictions about these changes, and is a critical technique for navigating uncertainty and guiding scenario planning. Trendspotting establishes governance and communication mechanisms for collaborating with constituencies inside and outside the organization regarding trends.

Business Impact

Trendspotting helps organizational leaders:

- Identify which trends and disruptions may have an impact on the business and how to respond with changes to operations or strategy.
- Evaluate trends' strategic relevance to drive more purposeful, outcome-driven innovation.
- Anticipate the future and explore likely outcomes to provide decision makers with actionable information for more prudent investments.

Drivers

- Trendspotting is gaining greater use as a broader, structured and purposeful process as part of strategic business, scenario and innovation planning.
- Gartner has seen an increase in the number of CTOs looking to establish a trendspotting capability as part of the CTO organization.
- Coordinated trendspotting is a more efficient and effective use of time and resources and allows trends to be leveraged in many different organizational contexts.
- The need to navigate uncertainty and guide scenario planning creates greater need for trendspotting.
- Companies need to gather and qualify more information from more sources, and get it in the hands of decision makers more quickly to support digital transformation.
- Companies with a trendspotting capability are less likely to be blindsided by unexpected events.
- Analyzing and contextualizing trend impact is an important part of risk analysis and mitigation.

Obstacles

- Trendspotting is often an informal, ad hoc and niche activity, with little information sharing between groups and no coordinated response.
- Technology tracking can be mistaken for trendspotting. Technology tracking looks at the state of a discrete technology, while a technology trend looks at a broader set of technologies evolving over time.
- Lack of detailed analysis of the factors driving and influencing a trend to determine when and how to respond can lead to reactive decisions that do not drive long-term value.
- Trendspotting that is not closely aligned with business impacts becomes academic and undermines the effective allocation of resources.

User Recommendations

- Develop methods to identify and contextualize trends using the “tapestry” that considers technological, political, economic, social/cultural, trust/ethics, regulatory/legal and environmental (TPESTRE) factors.
- Determine the desired outcome (e.g., inform, explore, advise) and scope of the effort to allocate adequate resources.
- Exploit Gartner research, including Hype Cycles, Trend Lists and Trend Radars as the starting point for trendspotting.
- Evaluate the impact of trends and how to deal with them, delivering forecasts, perspectives, and insights to help leaders plan using strategic foresight and other methodologies.
- Assess trends’ impact from the perspectives of people (customers, employees, partners), the business (products, services, processes) and technology (IT departments, systems).
- Utilize trend cards, radars, ideation tools, design thinking and other methods to collect, evaluate and communicate information about trends.

Sample Vendors

Brightidea; EY; Futures Platform; HYPE; ITONICS; Planbox

Gartner Recommended Reading

[The Gartner Trendspotting Framework: Driving Operations, Innovation and Strategy](#)

[Use a Trendspotting Method to Identify the Technology Trends You Need to Track](#)

[Hype Cycle for Emerging Technologies, 2022](#)

[Tool: Template for Developing Impactful Trend Cards](#)

[Getting Started With Trendspotting](#)

Climbing the Slope

Continuous Delivery

Analysis By: Hassan Ennaciri

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Adolescent

Definition:

Continuous delivery (CD) is a software engineering approach that enables teams to build critical software quickly, while ensuring the software can be released reliably anytime. Through dependable, low-risk releases, CD allows continuous adaptation of the software to incorporate user feedback, market shifts and business strategy changes. This approach requires the engineering discipline to facilitate complete automation of the software delivery pipeline.

Why This Is Important

The growing success of DevOps initiatives continues to drive investments in CD capabilities. CD improves software release velocity and reliability, while simplifying compliance enforcement via automation. It is a prerequisite and the first step to continuous software deployments for organizations that aspire to push changes with zero downtime.

Business Impact

CD is a key practice for a DevOps initiative as it reduces the build-to-production cycle time. As a result, it 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.

Drivers

- Increased adoption of Agile and DevOps practices to deliver solutions.
- Pressure from digital business to improve release velocity and reliability.
- Additional compliance requirements that require automation and orchestration of release activities for better traceability and auditability.

- The need to improve delivery outcomes to deploy application builds and updates more consistently, by extending the benefits of continuous integration (CI) and automated testing to continuously build deployable software.

Obstacles

- Organizational culture and collaboration between teams with different roles and skills are major barriers to CD success. Agile practices that helped bridge the gap between business and development must be extended to deployment, environment configuration, monitoring, and support activities.
- Lack of value stream mapping of product delivery hinders visibility and quick feedback loops for continuous improvements. Teams struggle to improve and focus on value work, as they don't have insights into the critical steps in the process, the time each step takes, handoffs, and wait states.
- Manual steps and processes involved in deploying to production environments impact software flow delivery.
- Other challenges impacting the success of CD include application architecture, lack of automation in all areas of testing, environment provisioning, configuration security and compliance.

User Recommendations

- Evaluate all associated technologies when you start a CD initiative and take an iterative approach to adoption. This will require collaboration with different stakeholders from the product, development, security and operations teams.
- Establish consistency across application environments for a higher likelihood of success and implement a continuous improvement process that relies on value stream metrics.
- Evaluate and invest in associated tooling, such as application release orchestration tools, containers, and infrastructure automation tools. These tools provide some degree of environment modeling and management, which can prove invaluable for scaling CD capabilities across multiple applications.
- Explore a DevOps platform that provides fully integrated capabilities and enables continuous delivery of software.

Sample Vendors

Broadcom; CloudBees; GitLab; Harness; JFrog; Red Hat

Gartner Recommended Reading

[How to Build and Evolve Your DevOps Toolchains](#)

[Market Guide for Value Stream Management Platforms](#)

[Beware the DevOps Toolchain Debt Collector](#)

Machine Learning

Analysis By: Shubhangi Vashisth, Peter Krensky

Benefit Rating: Transformational

Market Penetration: 20% to 50% of target audience

Maturity: Mature mainstream

Definition:

Machine learning (ML) is an AI discipline that solves business problems by utilizing statistical models to extract knowledge and patterns from data. The three major approaches that relate to the types of observation provided are 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).

Why This Is Important

Over the last few years, ML has gained a lot of traction and is entering mainstream adoption because it helps organizations to make better decisions at scale with the data they have. ML aims to eliminate traditional trial-and-error approaches based on static analysis of data, which are often inaccurate and unreliable, by generalizing knowledge from data.

Business Impact

ML drives improvements and new solutions to business problems across a vast array of business, consumer and social scenarios, such as:

- Credit approval automation

- Price optimization
- Customer engagement
- Supply chain optimization
- Predictive maintenance
- Fraud detection

ML impacts can be explicit or implicit. Explicit impacts result from ML initiatives. Implicit impacts result from products and solutions that you use without realizing they incorporate ML.

Drivers

- Augmentation and automation (of parts) of the ML development process has improved productivity of data scientists and enabled citizen data scientists to make ML pervasive across the enterprise.
- Availability of quality, labeled data is driving ML adoption at enterprises.
- Pretrained ML models are increasingly available through cloud service APIs, often focused on specific domains or industries.
- ML education is becoming a standard at many academic institutions, fueling the supply of talent in this space.
- Active research in the area of ML in different industries and domains is driving applicability far and wide.
- Newer learning techniques — such as zero- or few-shot learning — are emerging, reducing the need to have high volumes of quality training data for ML initiatives, thus lowering the barrier to entry.
- New frontiers are being explored, including federated/collaborative, generative adversarial, transfer, adaptive and self-supervised learning — all aiming to broaden ML adoption.

Obstacles

- Conventional engineering approaches are unable to handle the growing volumes of data, advancements in compute infrastructure and associated complexities.
- ML is not the only popular AI initiative to emerge in the last few years. Organizations also rely on other AI techniques, such as rule-based engines, optimization techniques and physical models, to achieve decision augmentation or automation.
- Organizations still struggle to take their ML models into production. MLOps continues to be a hot trend and organizations look to specialized vendors and service providers for support in their journeys of better operationalizing ML models.
- Application of ML is often oversimplified as just model development. Several dependencies that are overlooked — such as data quality, security, legal compliance, ethical and fair use of data, and serving infrastructure — have to be considered in ML initiatives.

User Recommendations

- Assemble a (virtual) team that prioritizes ML use cases, and establish a governance process to progress the most valuable use cases through to production.
- Utilize packaged applications that fit your use-case requirements to derive superb cost-time-risk trade-offs and significantly lower the skills barrier.
- Explicitly manage MLOps and ModelOps for deploying, integrating, monitoring and scaling analytical, ML and AI models.
- Adjust 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.

Sample Vendors

Amazon; ClearML; Databricks; Dataiku; Domino Data Lab; Google; H2O.ai; KNIME; Microsoft; MindsDB

Gartner Recommended Reading

[Market Guide for Multipersona Data Science and Machine Learning Platforms](#)

[Market Guide for DSML Engineering Platforms](#)

[How to Improve the Performance of AI Projects](#)

[Infographic: Common Layers of Data Science and Machine Learning Activity](#)

[Use Gartner's MLOps Framework to Operationalize Machine Learning Projects](#)

Enterprise Architecture

Analysis By: Philip Allega, Marcus Bloch

Benefit Rating: High

Market Penetration: More than 50% of target audience

Maturity: Mature mainstream

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 the desired business vision and outcomes. EA is used to steer decision making toward the evolution of the future-state architecture.

Why This Is Important

The primary uses of the EA discipline are to grow revenue, optimize costs and mitigate risk. The discipline supports these uses by supporting innovation, identifying information and technology changes to the business and operating model, managing IT costs and improving IT processes. This range of benefits is often misunderstood. Clarity of these benefits continues to evade both existing practitioners and those who can benefit from the use of EA.

Business Impact

The use of EA impacts business by:

- Delivering new value to the enterprise — not just to IT — through a focus on disruptions and changes in the business and operating model.
- Using design thinking, total experience and agile to improve IT delivery in direct support of an organization's desired outcome.

- Advising IT executives and other CxOs of the impact of desired change upon their future-state digital business vision.

Drivers

- From 2021 to 2022, Gartner client inquiry showed an increase in interest in enterprise architecture up by 39%. The run rate of inquiries through March 2023 suggests a further jump of 19% in 2023. This suggests that new practitioners and a change of focus of the EA programs are underway.
- EA is slowly moving up the Slope of Enlightenment, shy of its potential. Benchmark data from the [IT Score for Enterprise Architecture and Technology Innovation](#) reveals organizations primarily use EA to support solutions and technical architecture, rather than to enable business and operating model change. Yet, [Infographic: Benchmark Data From the IT Score for Enterprise Architecture](#) shows desire of an EA effort with a broader scope and impact.
- Modernization of the IT estate due to costs, aging technology, skills availability, performance issues with software and/or hardware, trouble ticket volume on critical systems, and lack of visibility on what makes up the current state (i.e., where data comes from, who uses which systems and when, and the number and types of databases, applications, business processes, etc.).
- IT department improvements with the latest technologies or approaches to improve IT end-to-end processes (e.g., AI, cloud, agile and DevOps).
- Impact on change caused from within IT plus technology producers outside the IT department (e.g., democratization, consultancies, etc.).
- New technology adoption and adaptation to improve the organization's business model, business capabilities, ecosystems, value streams, and customer and employee journey maps. Roadmaps illustrate the state of change to IT and business that helps senior business leaders take informed decisions to succeed.
- The drivers suggest that the maturity and aspirations are not yet met. It also indicates that a slow climb up the Slope of Enlightenment is underway for the current group of practitioners in today's business environment.

Obstacles

- Practitioners failing to expand the use, or value proposition, of EA beyond IT delivery because doing so is beyond their personal comfort zone.
- Misperceptions that EA is limited to technology choice within an in-flight project or product.
- Beliefs that EA controls and manages technology choices and solution design to control technical debt, govern daily choices within IT, consolidate technology estate components to single instances, and approve all design decisions for in-flight delivery efforts, regardless of methodology.
- Focus on managing the IT estate within the IT organizational unit, rather than the consumption of IT by others outside of the IT department, to deliver business value.
- Inability to articulate the value proposition to others, vetting or validating what is expected to define success.
- Past experiences or perceptions of EA, which limit the ability to consider the greater value EA could provide beyond IT alone.

User Recommendations

- Flexibly respond to rapid change, accepting that target state journeys are no longer linear.
- Measure value-add to the business, and not just to IT.
- Differentiate EA practitioners from engineers of solutions.
- Use EA services to support others as an internal management consultancy.
- Employ business categorization schema such as capability models.
- Provide roadmaps of change desired, anticipated and occurring to leadership teams.
- Act as critical advisors for CIOs and other CxOs on digital business issues.
- Provide guidance to build out the digital business technology platform.
- Create deliverables that bridge the gap between opportunities, threats and execution challenges to enable investment decision making.

Sample Vendors

Ardoq; Avolution; Bizzdesign; BOC Group; Capsifi; LeanIX; MEGA International; Orbus Software; QualiWare; Software AG

Gartner Recommended Reading

[Predicts 2023: Enterprise Architecture Charts New Path for Postdigital Era](#)

[Top Strategic Technology Trends for 2023](#)

[13 Best Enterprise Architecture Practices to Ensure Program Success](#)

[How Enterprise Architects Use OKRs to Deliver Business Outcomes](#)

[Total Experience Transformation Starts With Business Architecture — Presentation Materials](#)

Enterprise Conversational AI Platforms

Analysis By: Gabriele Rigon, Bern Elliot

Benefit Rating: Transformational

Market Penetration: More than 50% of target audience

Maturity: Mature mainstream

Definition:

Enterprise conversational AI platforms (ECAIPs) are a strategic product for enterprises that need multiple, scalable and sophisticated chatbots and virtual assistants. These platforms provide a variety of capabilities with a no-code toolset for business users to build and maintain chatbots and virtual assistants. There is an incredibly wide array of use cases, including coverage for customer service, contact center automation, ITSM and HR scopes.

Why This Is Important

ECAIPs comprise a collection of technologies that enable centralized implementation and operations across multiple chatbot initiatives. They provide enterprise-grade, no-code tooling to support both Q&A and transactional use cases, and to create custom conversational interfaces to interact with business applications in general. Such platforms include capabilities to improve business outcomes when building, testing, deploying and optimizing AI-enabled conversational interfaces.

Business Impact

Automating and augmenting human-based interactions in the enterprise has tremendous business impact. Among the benefits brought by chatbots, AI-enabled conversational interfaces and specific capabilities offered by ECAIPs are human capacity augmentation, customer and employee-experience enhancement, cost savings, insightful analytics based on conversational data. ECAIPs allow enterprises to centralize assets and capabilities and to democratize access to design, development and monitoring of CAI implementations.

Drivers

- **Generative AI:** The hype around generative AI and ChatGPT is generating an increasing amount of interest in conversational AI capabilities in the market. Conversational AI platforms offer a center of gravity that an organization can build a chatbot strategy around.
- **Diversity and abundance of offerings:** The number of vendors is still staggeringly large, at more than 2,000 worldwide. However, Gartner estimates that only about 150 of these vendors can be considered to be possible strategic choices for the major use cases.
- **Voice capabilities:** The consolidation of sophisticated voice capabilities, including conversation analytics and voice biometrics capabilities, have made large-scale contact center automation viable, with huge potential for savings and great customer experience.
- **Broader scope of use cases and capabilities:** There is still value in specialist offerings — vendors that specialize in industry, domain or even tasks. However, over the long term, the market will be dominated by larger horizontal platforms that offer industry, domain and task components on top of a versatile platform core, to address the needs of broader use cases such as contact center automation and employee-facing use cases that span CAI but also intelligent document processing and robotic process automation.

Obstacles

- **Immature buyers:** Many buyers remain immature or have little experience and rely on outdated advice and practices, resulting in simplistic and tactical applications that generate poor adoption.
- **Diversity of approaches:** End users are still exposed to a variety of products, deployment methodologies, pricing structures, ambiguous scopes of work, and the inability to quantify the value of platforms and implementations.
- **Scaling:** The major challenge is scaling the implementations from proofs of concept or initial deployments to strategic and operationalized deployments that bring tangible business value.
- **Generative AI:** The increasing availability of embedded generative and conversational AI capabilities and user interfaces (UIs) in enterprise and consumer products, such as insight engines or productivity applications, will also erode the utility of traditional chatbots in nontransactional, Q&A-based interactions.

User Recommendations

- Avoid technical debt by planning and investing in options for integrating with LLMs and generative AI capabilities, choosing platforms built on a modular architecture that allows for flexibility in choosing embedded LLM or external generative AI services.
- Enable your initiative by choosing enterprise-ready platforms that support your core requirements around use-case scope, language support, as well as no-code options that allow nondevelopers and non-data-scientists to do build, maintenance and evolution tasks.
- Mitigate risks of low adoption and noncompliance by choosing platforms that provide capabilities and accelerators aligned to your domain (use-case) needs coupled with continuous optimization tooling. Focus on monitoring and enhancing the overall UX and conversational aspects as well as security and privacy-protection skills.
- Ensure the scalability of your investment by strategically choosing platforms that support multiple use cases, multiple bots and multiple roles within the enterprise, and that have strong orchestration and synergies between the required integrations.

Sample Vendors

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

Gartner Recommended Reading

[Magic Quadrant for Enterprise Conversational AI Platforms](#)

[Critical Capabilities for Enterprise Conversational AI Platforms](#)

[Choosing the Right Conversational AI Platform](#)

[Quick Answer: How to Prioritize Requirements in the RFP for Conversational AI](#)
[Tool: RFP for Enterprise Conversational AI](#)

EA Tools

Analysis By: Akshay Jhawar, Andrew Gianni

Benefit Rating: High

Market Penetration: 20% to 50% of target audience

Maturity: Early mainstream

Definition:

Enterprise architecture (EA) tools are software products that help EA practitioners capture, structure, analyze and present business and IT models. EA tools support enterprise strategic planning and execution, as well as model, track and communicate continuous improvement, organizational transformation, optimization, change and innovation initiatives. They inform business and IT investment decisions.

Why This Is Important

EA tools allow organizations to model their current and future business and IT capabilities and examine the impact of any kind of change. They capture the interrelationships and interdependencies within and between ecosystems of partners, operating models, strategies, outcomes, people, processes, information, applications and technologies. Models represent the relationships between artifacts and are themselves treated as assets that help describe and shape the future of the enterprise.

Business Impact

EA tools help enterprises:

- Make business and IT investment decisions within the context of the business strategy. They help combine business and IT operating models with operational performance data to guide decisions that realize business outcomes.
- Extend the view of business and IT architecture beyond the direct control of enterprise architects and business and IT leaders into an increasingly democratized digital business environment within and across the organization and its ecosystem.

Drivers

- Gartner clients continually show interest in EA tools and the interest has been growing over the last two years. Clients are looking for tools to help them get insight into their business — but foremost, in IT capabilities and portfolio management — and with that provide guidance to business and IT leaders to support digital transformation.
- The majority of organizations are undergoing a digital business transformation. According to the 2021 Gartner Business Benefits of Operating Model Choices Survey, 83% of respondents showed aspiration for digital transformation. Supporting such transformation requires organizational leaders to model current- and future-state enterprise viewpoints, while supporting, and interfacing and interoperating with, other disciplines. These include innovation management, enterprise risk management, and program and portfolio management. EA tools are well-suited to provide such features.
- Organizations' continued investment in scaling digital business capabilities drives strategic importance and use of business and IT models to assess, enable or transform into a digital business. These investments are fueling adoption of EA tools; EA tool vendors' annual revenue grew by an average of almost 50% from 2021 to 2022.
- Organizations continue to struggle with linking business to IT — as in, strategy to operations — which requires analysis, reporting, modeling and visualization for a variety of perspectives. EA tools provide the features to create a digital model of an organization, its business and IT operations, and business and IT capabilities; define customer journeys and value streams, heat maps, and roadmaps; and link perspectives to projects and operational assets.

Obstacles

- Often, organizations purchase EA tools without clarifying their use cases or the alignment with EA services and targeted business outcomes, leading to failed adoption.
- Most companies perceive EA tools as a disconnected document repository to archive IT-architecture-related content. Some see it as a diagramming tool limited to technology and solutions architecture graphics, storing principles and policies, and guiding IT projects.
- The initial structuring, extending and continuous restructuring of the repository are challenging and resource-intensive.
- Maintaining the repository and evolving its use over time is a common barrier to organizations realizing long-term value from their EA tool. Organizations fail to appreciate the maintenance burden associated with these repositories and the tooling ecosystem.

User Recommendations

The successful acquisition and adoption of EA tools requires a business value proposition as well as IT and business stakeholder support. EA practitioners must:

- Develop use cases that link EA tool capabilities to business outcomes.
- Articulate the compelling business problems that an EA tool will help solve or the opportunities it will help exploit.
- Assess the commitment and skills of the EA team and others to use an EA tool.
- Anticipate the complexities associated with adopting an EA tool within the organizational culture.
- Ensure data governance, data ownership, data access and clarity on what data is used, why and how. Assess integration needs with adjacent tools such as CMDB, portfolio management and agile planning.
- Deliver promised business value and benefits, and communicate them to leadership stakeholders.
- Consider the time it takes to realize value from an EA tool, and obtain implementation and operations support via vendor or its partners to realize short-term objectives.

Sample Vendors

Ardoq; Avolution; Bizzdesign; BOC Group; Capsifi; LeanIX; MEGA International; Orbus Software; QualiWare; Software AG

Gartner Recommended Reading

[Magic Quadrant for Enterprise Architecture Tools](#)

[Critical Capabilities for Enterprise Architecture Tools](#)

[Toolkit: How to Construct a Winning RFP for Buying EA Tools](#)

[8 Steps to Select and Obtain Value From Enterprise Architecture Tools](#)

Appendixes

See the previous Hype Cycle: [Hype Cycle for Enterprise Architecture, 2022](#)

Hype Cycle Phases, Benefit Ratings and Maturity Levels

Table 2: Hype Cycle Phases

(Enlarged table in Appendix)

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

Source: Gartner (June 2023)

Table 3: Benefit Ratings

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

Source: Gartner (June 2023)

Table 4: Maturity Levels

(Enlarged table in Appendix)

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

Source: Gartner (June 2023)

Evidence

¹ [7 Actions Enterprise Architecture Leaders Must Take to Navigate Economic Headwinds](#)

² [9 Winning Actions to Navigate Inflation and Recession](#)

Note 1: EA Playbook

The EA playbook contains all the parts and pieces that make up the EA practice's go-to-market approach for getting things done successfully. It includes a list of services, engagement plan/model, governance, resources, deliverables, process workflows, standard operating procedures and cultural values that shape a consistent response/approach to offering EA as a service — "the play."

Document Revision History

[Hype Cycle for Enterprise Architecture, 2022 - 20 June 2022](#)

[Hype Cycle for Enterprise Architecture, 2021 - 6 August 2021](#)

[Hype Cycle for Enterprise Architecture, 2020 - 3 September 2020](#)

[Hype Cycle for Enterprise Architecture, 2019 - 29 July 2019](#)

[Hype Cycle for Enterprise Architecture, 2018 - 19 July 2018](#)

[Hype Cycle for Enterprise Architecture, 2017 - 28 July 2017](#)

[Hype Cycle for Enterprise Architecture, 2016 - 20 July 2016](#)

[Hype Cycle for Enterprise Architecture, 2015 - 30 July 2015](#)

[Hype Cycle for Enterprise Architecture, 2014 - 22 July 2014](#)

[Hype Cycle for Enterprise Architecture, 2013 - 31 July 2013](#)

[Hype Cycle for Enterprise Architecture, 2012 - 25 July 2012](#)

[Hype Cycle for Enterprise Architecture, 2011 - 26 July 2011](#)

[Hype Cycle for Enterprise Architecture, 2010 - 16 July 2010](#)

Recommended by the Authors

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

[Understanding Gartner's Hype Cycles](#)

[Tool: Create Your Own Hype Cycle With Gartner's Hype Cycle Builder](#)

[7 Actions Enterprise Architecture Leaders Must Take to Navigate Economic Headwinds](#)

[2023 CIO and Technology Executive Agenda: 4 Actions to Deliver 'Digital Dividends'](#)

[Leadership Vision for 2023: Enterprise Architecture](#)

[Predicts 2023: Enterprise Architecture Charts New Path for Postdigital Era](#)

[4 Top Practices That Help EA/TI Leaders Add Value to Artificial Intelligence Initiatives](#)

[What Is Artificial Intelligence? Ignore the Hype; Here's Where to Start](#)

[Building a Digital Future: Autonomic Business Operations](#)

[Applying AI — A Framework for the Enterprise](#)

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Table 1: Priority Matrix for Enterprise Architecture, 2023

Benefit ↓	Years to Mainstream Adoption			
	Less Than 2 Years ↓	2 - 5 Years ↓	5 - 10 Years ↓	More Than 10 Years ↓
Transformational	Enterprise Conversational AI Platforms	Decision Intelligence Digital Twin Innovation Management Journey Maps Machine Learning Total Experience	Autonomic Systems Customer Technology Platform Minimum Viable Architecture	
High	Business Capability Modeling	Business Ecosystem Modeling Composable Applications Continuous Delivery Digital Design EA Governance EA Tools Information Architecture Knowledge Graphs Operational Experience Roadmapping Trendspotting Value Stream Mapping	AI Engineering Business Architecture Customer Experience Enterprise Architecture Product Architecture	Machine Customers

Benefit	Years to Mainstream Adoption			
↓	Less Than 2 Years ↓	2 - 5 Years ↓	5 - 10 Years ↓	More Than 10 Years ↓
Moderate		Solutions Architecture	Business Design Democratized Architecture	
Low				

Source: Gartner (June 2023)

Table 2: Hype Cycle Phases

Phase ↓	Definition ↓
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Phase ↓

Definition ↓

Source: Gartner (June 2023)

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Source: Gartner (June 2023)