Critical Capabilities for Enterprise Architecture Tools

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Initiatives: Digital Business Change Initiatives

Enterprise architecture tools support the delivery of business outcomes by providing a central repository for managing and analyzing enterprise data to highlight the impact of change. EA leaders need to assess the product capabilities of vendors in relation to five key use cases.

This Critical Capabilities is related to other research:

Magic Quadrant for Enterprise Architecture Tools

View All Magic Quadrants and Critical Capabilities

Overview

Key Findings

- **Users Limit Their Tool Scope:** Enterprise architecture (EA) teams often limit the scope of their EA tools to cataloging the life cycles and constraints of existing IT systems, applications and technologies. They miss the opportunity for EA tools to capture the business architecture, which supports business strategy and design and underpins the organization's wider change plans.
- **Use Cases Beyond Traditional EA:** EA tools often fail to gain traction beyond EA, which limits their benefits. Without a focus on a shared operating model for the enterprise — supporting transformation, optimization and ongoing innovation — it can be difficult to justify the effort necessary to maintain the EA tool, leading to disuse.
- **EA Tool Management Costs Often Underestimated:** EA tools require significant investments in time and resources to configure, populate and maintain. Although necessary for long-term success, low-maturity organizations might incorrectly assume that an EA tool will be sufficient to successfully kick off an EA program and resolve all their challenges.

Recommendations

EA leaders assessing EA tools should:

- **Build an Outcomes-Focused EA Tool Business Case:** Articulate the short-, medium- and long-term use cases for an EA tool by defining the critical business challenges, opportunities and objectives of the organization. Look beyond just IT rationalization and modernization to explore how the use cases and critical capabilities of EA tools in this research map to the needs of your enterprise.
- **Ensure EA Tool Use Cases Address Stakeholder Needs:** Identify the needs of both business and IT stakeholders in your evaluation by including their requirements in your use cases. The long-term success of an EA tool relies on its broad adoption across the enterprise.
- **Assess EA Tool Total Cost of Ownership (TCO):** Estimate costs by evaluating how vendor pricing models and usability will affect the tool's software costs and adoption. Explore the impact of business and operating model changes, increases in the number of users, and evolving integration scenarios. Look beyond the initial costs and current functionality to include the costs of upgrades, software licensing implications, new functionality and professional services over the whole term.

What You Need to Know

EA tools service an increasingly wide range of stakeholders, from the boardroom and the C-suite, across all strategic and operational business roles, down to the IT estate. EA tools are also used by a broad array of architectural and IT disciplines, including information, solutions, security, applications and infrastructure. With a single integrated version of the truth, EA tools help these stakeholders receive relevant information, see the need for alignment and make more informed decisions.

EA tools operate at many levels and across a wide spectrum, in one way or another reflecting:

- Business strategies, objectives, capabilities, competitors, ecosystem partners, products and services, as well as the KPIs, metrics, risks and the related costs.
- Customer segments, stakeholder personas and customer journey maps, as well as the processes, value streams and activities that the organization depends on to deliver value.

- Business scenarios, change and transformation programs, and initiatives, up to and including individual projects and development sprints in IT.
- Supporting technologies and applications, the services they offer and the interfaces between them, the underlying infrastructure, and the vendors that provide these components.

Minimally, EA tools provide a central repository to capture and analyze data and metadata about the wide range of artifacts (objects) that enterprises care about. Maximally, they can support complex analytics and visualizations, automate and monitor governance workflows, and provide recommendations for a range of transformation scenarios.

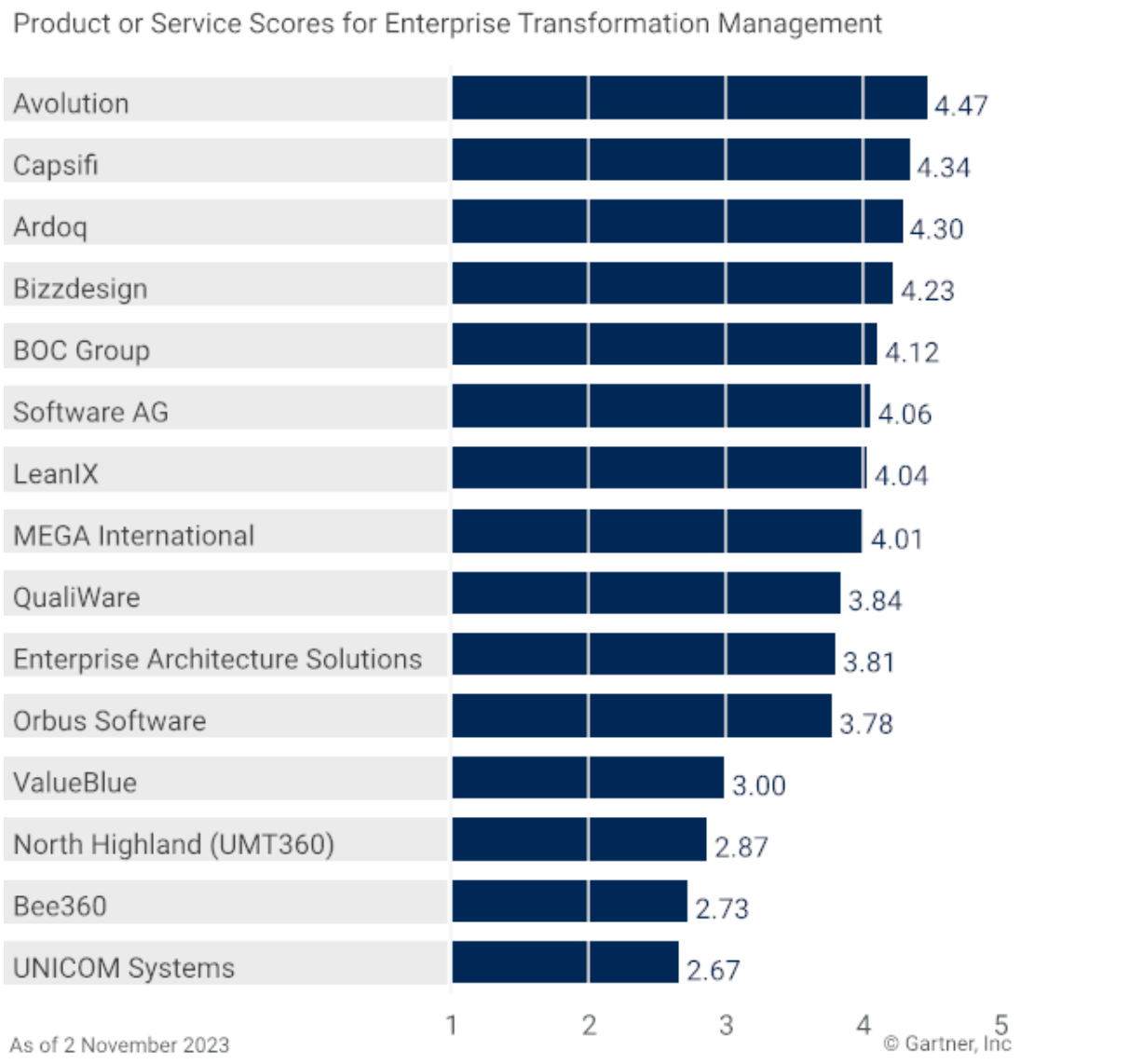
Models contained in the repository represent the relationships between these objects. They are treated as assets that describe and shape the future of the enterprise. Many types of models are possible, depicted at different levels of abstraction (e.g., conceptual, logical, physical) in different ways (e.g., visually engaging, written descriptions) and in different packaging constructs (e.g., bills of materials, configurations, policies, standards life cycling, patterns, blueprints, platforms).

Gartner's vendor write-ups in this Critical Capabilities analysis highlight the key features that we identified during product demonstrations. The use-case scores represent the formally scored, weighted aggregation of the vendor's responses to our questionnaire (see Figures 1 to 5). Each vendor write-up includes a description of how the product is delivered, its key differentiators and its drawbacks.

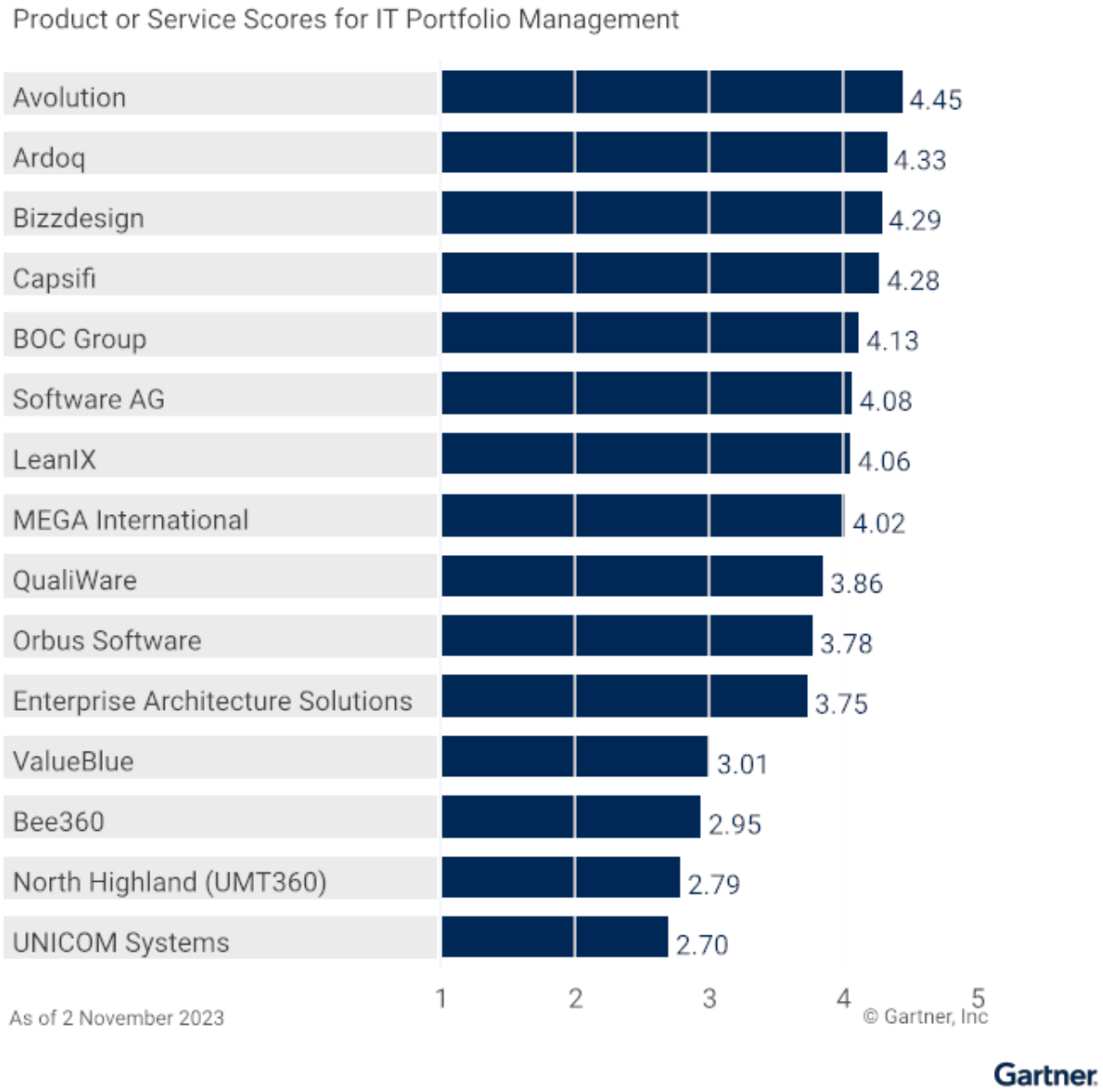
Analysis

Critical Capabilities Use-Case Graphics

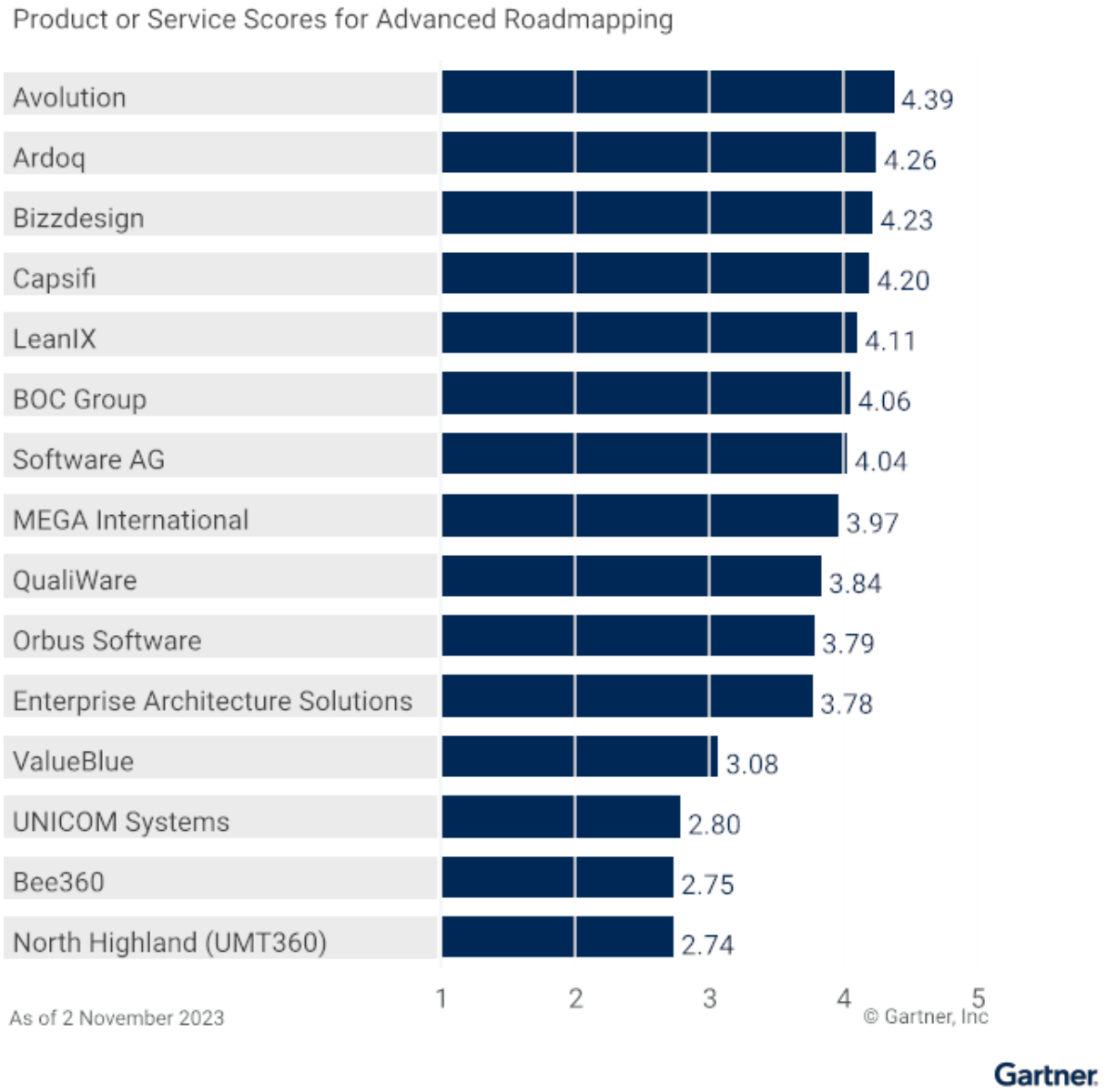
Vendors' Product Scores for Enterprise Transformation Management Use Case



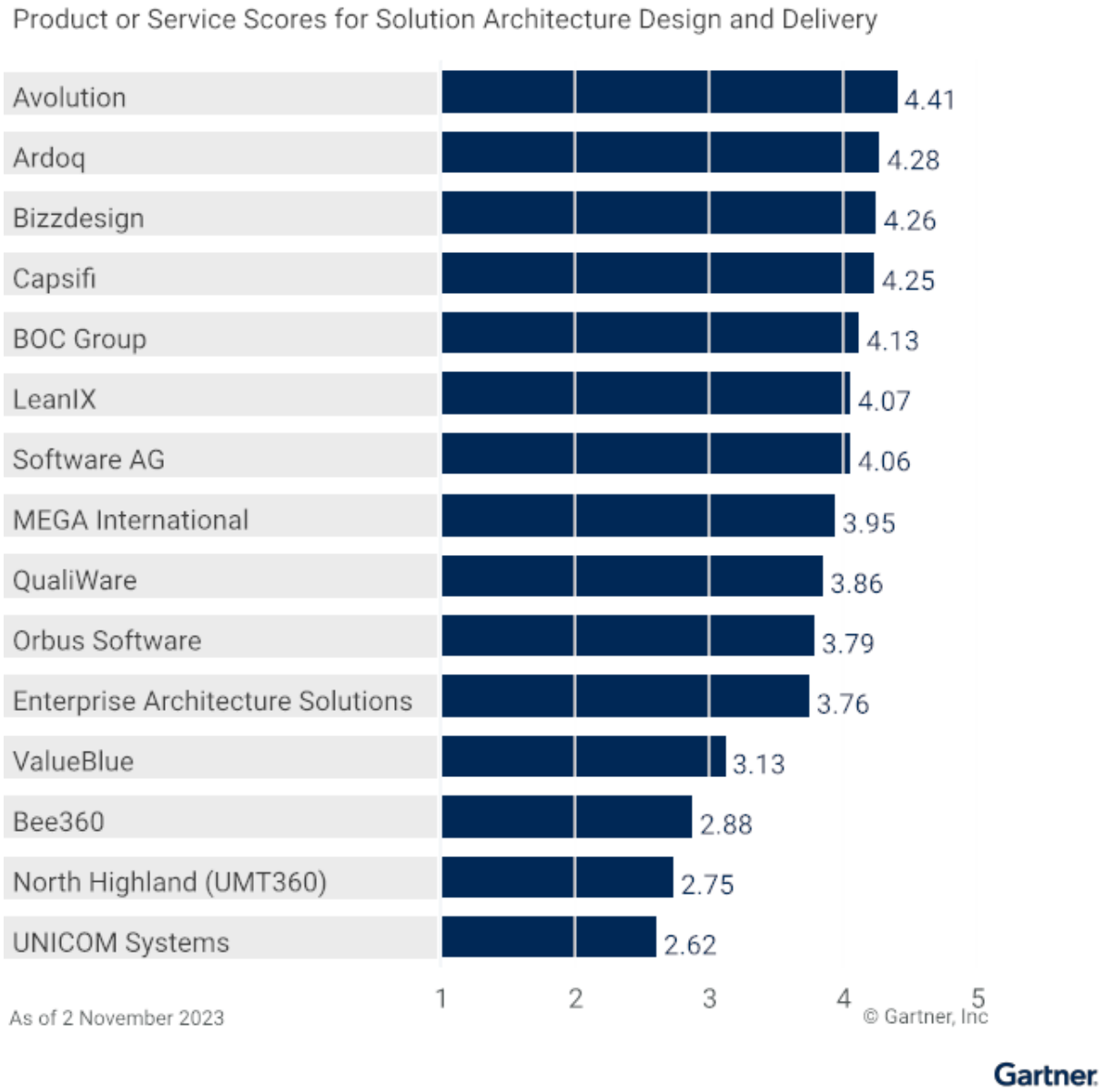
Vendors' Product Scores for IT Portfolio Management Use Case



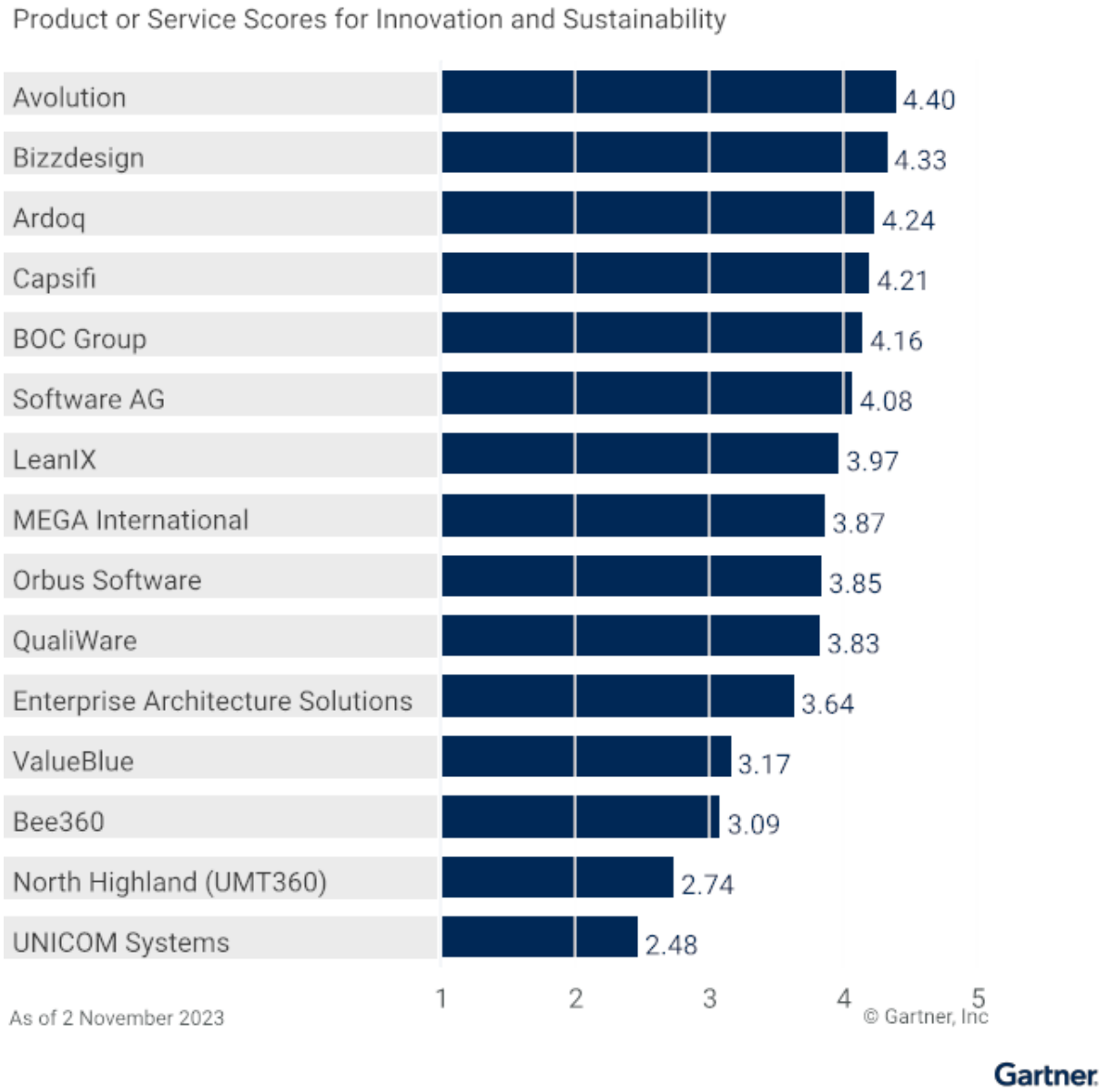
Vendors' Product Scores for Advanced Roadmapping Use Case



Vendors' Product Scores for Solution Architecture Design and Delivery Use Case



Vendors' Product Scores for Innovation and Sustainability Use Case



Vendors

Ardoq

Primary EA Product: Ardoq is delivered as a cloud-native, continuously deployed SaaS product. The key differentiator is the property graph database, which enables high-level control over the capturing, structuring, versioning and reuse of model components within the repository. Although the overall environment is fully extensible, that flexibility also implies that a degree of sophistication is needed to leverage the full power of the product. To support security and risk management, Ardoq Discover, combined with Broadcasts, can support governance to gather information and notify stakeholders based on events and the architecture.

Use-Case Ratings:

- **Enterprise Transformation:** Ardoq Discover leverages natural-language queries augmented with Azure's OpenAI "text-embedding-ada" service to optimize theme-based searches for identification of transformation hot spots. Their Graph data model enables disruption and risk analysis across all models, related objects and assets to identify impacts across the client's transformation landscape. Using the Inference model, clients can analyze new data sources to explore object and attribute mappings, and recommend new enterprise models. By applying persona modeling, clients can coordinate the enterprise transformation architecture, associated workflows and stakeholder engagement.

- **IT Portfolio Management:** Ardoq's adapters for merge.dev, Amazon Web Services (AWS), Microsoft Azure and Google Cloud enable integration with standard DevOps and IT ecosystems; together with support for federated repositories, this allows clients to curate IT portfolio data from a range of sources. The integration of the Broadcast messaging platform embeds and automates further data gathering, governance tasks and stakeholder collaboration. Configurable graphics (bubble and Gantt charts) and Ardoq Scenarios help clients create dashboards for IT portfolio data across a range of IT metric viewpoints.

- **Advanced Roadmapping:** Ardoq leverages capability-based approaches and the "capability delta" concept to drive roadmapping. Their Discover module enables strategy-to-execution modeling to support tracking of stated objectives and key results (OKRs) and planned and inflight initiatives. Integration with agile planning tools such as Jira enables importing and alignment of OKRs and initiatives, including capability deltas, to clients reprioritizing initiatives and their associated roadmaps.

- **Solution Architecture Design and Delivery:** Ardoq supports multiple levels of solution design, from business to technology architectures. It uses its inference engine to translate architecture principles, and employs chatbot-enabled guardrails to identify issues and recommend alternatives if design decisions fall outside of standards. This allows clients to automate architecture standards and guardrails compliance, and demonstrate how these have been applied to solution design decisions.

- **Innovation and Sustainability:** Ardoq recommends a bottom-up and outside-in approach to ideation. Clients can use technology radar tools to present opportunities and risks during ideation. The Ardoq Broadcasts messaging platform helps clients collate and evaluate stakeholder voting on ideas. Persona modeling can be used to understand how these ideas impact persona journeys. Empathy maps then allow clients to assess sentiment and how this can affect customer journeys. Sustainability and environmental, social and governance (ESG) objectives can be defined and mapped across the innovation pipeline. Ardoq's Graph data helps to identify previously documented metric data, and roll this up through the strategies and objectives to present sustainability and ESG hot spots across the enterprise.

Avolution

Primary EA product: ABACUS, Version 10, released in 1Q23, is delivered on-premises, as a SaaS offering or as a hybrid. Its key differentiators are its graph database, the overall extensibility of its metamodel, strong AI/ML features (such as autocomplete) to curate metadata, and no-code analytic algorithms.

Use-Case Ratings:

- **Enterprise Transformation Management:** ABACUS offers a comprehensive set of tools to support strategic decision making, along with out-of-the-box (OOTB) project- and portfolio-oriented views with metadata-driven color coding, Gantt charts and immediate impact analysis. It offers support for multiple scenarios from different perspectives, be it current versus target state or two different plans of action. Metrics can be defined and tracked via dashboards that connect activities to outcomes.
- **IT Portfolio Management:** ABACUS allows users to manage the enterprise IT and application portfolio, offering bulk upload/update capabilities and AI/ML-assisted creation and maintenance of items in the repository. It supports multiple assessment frameworks OOTB, and its no-code algorithms can be used to drive dynamic heat-mapping.
- **Advanced Roadmapping:** ABACUS offers four different styles of roadmap OOTB: life cycle charts, work package dependencies, multiple architecture trade-offs and tag-based conceptual roadmaps. In combination, these can be used to drive identification and sequencing of strategic initiatives, with concepts and views suitable for a variety of stakeholders in IT and the business.
- **Solution Architecture Design and Delivery:** ABACUS offers a flexible visual modeling interface, which provides users with the ability to build diagrams from templates using a variety of complementary modeling languages over a single metamodel. Smart layout capabilities help users tame complex visual representations, and drill down views support progressive detail through navigation of multiple diagrams.
- **Innovation and Sustainability:** ABACUS uses surveys as a mechanism to solicit ideas, which are then tracked, voted on and tagged, ending up as projects in the portfolio. In addition, the incorporation of the World Economic Forum's core and extended metrics supports sustainability ideation, qualification and evaluation.

Bee360

Primary EA Product: Bee360, released April 2021, is delivered on-premises, or hosted on Bee360's private cloud. It replaces Bee4IT, which is maintained for existing clients. Bee360 bundles EA, strategic portfolio and resource management, enterprise agile planning, IT finance, and digital twins for organizations into a single platform to provide a holistic view of IT management.

Use-Case Ratings:

- **Enterprise Transformation Management:** Bee360 leverages a strategy dashboard with distinct Kanban boards to convey trends, strategic initiatives, and outcomes across a variety of focus areas (with varying granularity). Their trend functionality radar can be manually populated and displays various trends, categorized by adopt, trial, assess, and hold, as well as the key developments/implications of individual trends. Trends can also be aligned toward initiatives, and Bee360 also utilizes linked models to give visual representations of strategic vision, while having the ability to link pieces of architecture to the organization via relationships, capabilities, strategy, processes and applications.

- **IT Portfolio Management:** Bee360 uses a dashboard to visualize a variety of management practices and metrics, such as the application portfolio (on a tolerate, invest, migrate, eliminate [TIME] chart), technology life cycle, strategy alignment by capability, demand impact on EA, governance, current risks and application usage by location. Architects can set up demand evaluations, discuss solution ideas and priorities, and manage technologies, culminating in a custom-tailored panoramic view. The survey designer feature can be used to collaborate with business or IT stakeholders on specific priority areas to influence decision making.

- **Advanced Roadmapping:** Using initiative execution timelines, architects can populate an interactive Gantt chart to visualize concurrent execution activities, milestones and outcomes. Financial and resource targets can be set on a variety of planning horizons to inform business-driven outcomes and impacts. Bee360 also has the ability to link specific roadmaps to URL objects, allowing sharing and discussion via Microsoft Teams.

- **Solution Architecture Design and Delivery:** Modeling is completed via a draw.io integration, then deposited in Bee360's model repository. Architects can also explore the "context of model" feature, which shows instances where a model is used in a related context, enabling a more thorough understanding of multiple versions of a specific model. "Demands" for architectural work can be initiated via assessments, which an architect would review. Models can then be delivered by linking "demands" to the appropriate context, where they will then be realized.

- **Innovation and Sustainability:** Bee360 allows enterprise architects to manually document and prioritize trends and technologies, and link them to artifacts, projects and actions, systems, and business initiatives. Bee360 can show where a trend or technology was adopted by the organization. For ESG or sustainability objectives, the survey designer can be used to formulate assessments to promote external input and make data-based decisions.

Bizzdesign

Primary EA Product: Horizzon, Version 4, was released April 2023 and is delivered as a fully hosted SaaS solution, on-premises, or as a hybrid of on-premises and cloud-based components. Key differentiators are robust metrics and investment analysis features, and a high-security environment. To support cross-functional teams through the design to delivery life cycle, it leverages workflow capability to integrate GitHub with Horizzon.

Use-Case Ratings:

- **Enterprise Transformation Management:** Horizzon provides the Architecture-Led Framework (ALF) to help clients collect the data required for defining strategies, objectives and metrics, and connecting these to enterprise capabilities to support transformation decisions. Policies and tasks can be set up to automate data collection and capability assessments. Clients can use analysis techniques such as SWOT, PESTLE, Five Forces, Business Model Canvas, Balanced Scorecard and Value Streams to identify gaps and opportunities for developing portfolio transformation scenarios and initiatives.

- **IT Portfolio Management:** Horizzon uses capability-based analysis and planning, coupled with investment score analysis, to identify and prioritize IT portfolio investments. The ServiceNow App enables clients to pull configuration management database (CMDB) data to populate Horizzon and build the IT portfolio. Clients can set data policies and route tasks to application owners to improve data quality. Natural-language AI can be used to support application portfolio recommendations. Integration with Technopedia provides up-to-date end-of-life information to guide infrastructure investments for the IT portfolio. A broad range of IT portfolio dashboards present portfolio statuses and scenarios.

- **Advanced Roadmapping:** Horizzon provides clients with a range of roadmap views, and leverages SWOT and PESTLE analysis to help clients identify and prioritize technology opportunities against capabilities. Technology-radar-style roadmaps provide clients with a strategic view of technology opportunities against key business capabilities. Capability-based planning techniques help clients drill down into individual business capabilities to define detailed product and initiative roadmaps within the IT portfolio. Upstream and downstream dependencies, along with application and technology roadmaps, help identify conflicts.

- **Solution Architecture Design and Delivery:** Horizzon provides clients with workspaces to create and manage the deliverables that are used to define the solution architectures. Using repository data, clients can leverage business and IT reference models and artifacts to provide understanding and context, and guide solution design. The ability to reuse repository data to quickly define, present and assess different designs scenarios helps clients conduct solution options analysis for design recommendations. Horizzon leverages business and IT repository data and relationships, together with ML, to recommend future-state architectures, including IT portfolio dependencies, for solution delivery.

- **Innovation and sustainability:** Horizzon's Coach view provides clients with a structured approach to scanning threats and opportunities for supporting ideation. Clients can define and qualify ideas by strategic fit (including ESG and sustainability), feasibility, viability, risks, costs and capability enhancement. Innovation funneling allows clients to manage the ideation pipeline to ensure ideas are efficiently ranked and prioritized. Sentiment analysis, together with understanding how each idea links to the IT portfolio, helps clients present capability-based planning scenarios that can be translated into projects.

BOC Group

Primary EA Product: ADOIT, Version 16.0, released January 2023, is delivered either on-premises or via SaaS through public or private cloud. Through the concept of user-centric services, ADOIT delivers an option for a use-case-driven user experience to focus users' efforts on the activities that will deliver the most value. ADOIT offers many integrations through its marketplace to extend its capabilities and improve the user experience. Its metamodel and configuration features enable clients to benefit from persona-specific reports.

Use-Case Ratings:

- **Enterprise Transformation Management:** ADOIT's trend radar functionality supports tracking trends and technologies. Using concepts such as PESTLE analysis, it can help identify risks and opportunities and chart a course of action through the creation of a strategic roadmap. ADOIT offers a variety of dashboard visualizations to support the identification and tracking of enterprise transformation.

- **IT Portfolio Management:** ADOIT offers both diagram- and tabular-based interfaces for managing the IT portfolio. It supports the use of different metamodel profiles to avoid an overwhelming experience for those only interested in a limited set of concepts. The portfolio can be viewed from a capability or application/technology perspective and provides multiple rating schemes to evaluate the existing portfolio and identify investment priorities.
- **Advanced Roadmapping:** ADOIT offers dedicated workspaces to provide roadmapping functionality through its user-centric services. Workspaces are available to support strategic roadmaps, capability-based roadmaps or application-based roadmaps, where users can collect and prioritize requirements to chart a course of action for addressing them. ADOIT can create Gantt chart views, and management dashboard widgets are available to track progress on roadmap items.
- **Solution Architecture Design and Delivery:** ADOIT provides OOTB templates that support architecture design from multiple viewpoints. It provides the ability to create diagrams in many widely used visual modeling languages, such as ArchiMate, Google, Microsoft Azure and AWS cloud architecture modeling, and Unified Modeling Language (UML). It offers integrations with common collaboration tools such as Microsoft SharePoint or Atlassian Confluence to publish content outside of the tool, including embedded, interactive objects. ADOIT provides the ability to apply different visual modeling languages over its ArchiMate foundation to make content intuitive to nonarchitects.
- **Innovation and Sustainability:** ADOIT supports concepts such as stakeholder analysis, customer journey mapping and freeform whiteboarding, which it calls a brown paper model, to identify opportunities for innovation in the enterprise. An OOTB user-centered service for sustainability roadmapping supports environmental initiative planning using the visual language of UN sustainability goals.

Capsifi

Primary EA Product: Jalapeno, Version 1.5, released March 2023, is available on-premises, hosted on private cloud or public cloud, yet licensed primarily as a SaaS solution. Jalapeno is not modularized, but provides role-based pathways with defined access to features to allow strategic and operational decision making for executives, as well as business and technology stakeholders.

Use-Case Ratings:

- **Enterprise Transformation Management:** Jalapeno displays a business motivation structure that underpins and defines a fully navigable business-on-a-page canvas. Specific initiatives can be drilled through to explore scope, KPIs and metrics, and stakeholders, and have the potential to be updated in near-real-time through the application of REST-API interfaces with relevant data sources (like a CMDB, asset management database [AMDB], and planning or financial systems). Activities, such as setting strategy, planning an initiative, assessing a value stream, defining a solution, aligning scope and monitoring delivery, can all be selected via the transformation management view. The ability to explore relationships between a wide variety of technologies and applications helps derive overall impacts.

- **IT Portfolio Management:** Jalapeno offers an IT portfolio management pathway, which is broken down into several categories (onboarding, maintenance, analysis and optimization), all of which focus on managing and evolving an IT portfolio. Architects can also extend the Jalapeno metamodel to add new attributes, which are then automatically available for analysis. Users can utilize interaction diagrams to allow for visualization of complex relationships and can drill down to specific applications and technologies. A variety of visual tools (TIME charts, tree maps, heat maps) guide analysis, while distributed assessments provide insights into system performance in alignment with organizational objectives, all of which help inform architectural focus and planning.

- **Advanced Roadmapping:** Jalapeno offers the ability to organize a variety of roadmaps from different domains using its configurable pathway feature. Sections of this pathway include strategy, transformation, operations and technology. The roadmap view visualizes a singular roadmap or group of roadmaps, which appear in swim lanes with categories customized by a sort function. Project roadmaps allow architects to explore impacts across initiatives, and filtering is available to widen or narrow the preferred view. Architects can create and display milestones, which attach to items in the swim lane for simple tracking and enhanced visibility.

- **Solution Architecture Design and Delivery:** Jalapeno offers a three-tiered pathway for solution architecture stages (definition, evaluation and documentation). The solution option analysis allows architects to create new work packages as progression ensues, with the ability to include and assess risks, impacts and mitigation options. The interactive digital whiteboard allows for ad hoc sketches with drag-and-drop icons and the use of prepackaged templates for standardized formats. It also provides comprehensive criteria for scoring solution options that allow architects to assess and compare each solution alternative. Evaluation results can be plotted graphically to aid in collaborative discussion and analysis from non-EA stakeholders.

- **Innovation and Sustainability:** Jalapeno's Innovation and Sustainability pathway includes the focus, scope and delivery of both value stream and value proposition innovations. Comprehensive personas with custom segmentation against constraints can be created in Jalapeno and applied in analysis. Journey maps can be added with use of the "sticky notes" feature to ensure new developments are recorded and categorized. The Innovation pipeline view encompasses the discovery of an idea, definition of solution, development of proposal, delivery of innovation, deployment of outcome and measurement of value. The ideation management feature allows for idea priority scoring, which can then be further analyzed and customized.

Enterprise Architecture Solutions

Primary EA Product: Essential Project, Version 6.18, released May 2023. Rather than per-user-based pricing, Enterprise Architecture Solutions offers its SaaS and Docker editions as a single annual subscription, while Essential Open Source is available for free installation. Other than its extensible modeling editors and views, a key differentiator is the Essential Playbook Coach feature that provides context-specific guidance to help users get started with the tool. In addition, Essential Project uses OpenAI's large language model (LLM) to help users complete architecture information, such as recommendations for artifact descriptions.

Use-Case Ratings:

- **Enterprise Transformation Management:** Essential Project uses the business model portfolio tool and the Scaled Agile Framework (SAFe) Weighted Shortest Job First (WSJF) method to help clients define, structure and prioritize enterprise transformation. Clients can identify and define drivers and opportunities for innovation, and learn how this influences and changes the connected enterprise business models. Stakeholder collaboration enables clients to design the required business model components, including qualifying their impact, feasibility and priority through WSJF, leading to IT portfolio recommendations.

- **IT Portfolio Management:** Essential Project uses a combination of business capability, application portfolio, application service, application disposition and TCO analysis to provide portfolio insights. Business and IT asset information can be imported via REST APIs to support IT portfolio completeness. Editors provide users with the ability to add business and technology information and relationships to portfolio assets. Clients can use a TIME-based assessment or the application disposition model to analyze the impact of changes to the application landscape by timeline and/or business capability to support portfolio scenario and options analysis.

- **Advanced Roadmapping:** Essential Project uses a combination of a business model portfolio manager, roadmap dashboards, roadmap projects and application overlays to support enterprise roadmapping. Clients can use investment planning information to define detailed roadmaps across a range of domains and viewpoints, including any interdependencies across roadmaps and other architecture artifacts. Essential Project can overlay roadmapping information on the application landscape and play "roll the clock forward" to show the impact of the roadmap milestones on the landscape.

- **Solution Architecture Design and Delivery:** Essential Project uses a combination of Business Solution Builder, a strategic technology product selector, proposed design assessment capabilities and application principles assessment to help guide clients through solution design and delivery. Business solutions can be defined by reusing existing reference architectures. Solution architects can reuse reference architecture components, including selecting the applications and deploying technology. Application Editors enable solution architects to define data, integration and other aspects of the solution. Linkage to principles and reference architecture enables stakeholders to assess the solution's strategic alignment and compliance.

- **Innovation and Sustainability:** Essential Project users can capture and track their ideas, before capturing and structuring assumptions around an idea. Users create relationships to other repository objects (including other ideas), before potentially turning them into projects or incorporating into a wider change program. With its feature to define controls and monitor adherence, Essential Project can be used to monitor and track ESG activities.

LeanIX

Primary EA Product: LeanIX Enterprise Architecture Management (EAM) is delivered as a cloud-native, continuously deployed SaaS product. Its key differentiators are high scalability, a modern graph database and GraphQL, and REST APIs for integration.

Use-Case Ratings:

- **Enterprise Transformation Management:** LeanIX provides a trend landscape view to drive impact analysis across the enterprise. Using a PESTLE analysis framework, users can enter risk factors and LeanIX can make recommendations for trends to monitor, based on user-defined, no-code automation. Strategic initiatives can be associated with trends in the repository to drive transformation efforts. LeanIX offers a life cycle visualization view, combined with a visual summary of trend analysis, to help leadership track trends and transformation initiatives. The Business Transformation Management (BTM) module supports what-if analysis against multiple future states.
- **IT Portfolio Management:** The core of LeanIX's functionality lies in application portfolio management (APM), providing a framework to manage the application and technology portfolio life cycle. Using assessment concepts like Gartner's TIMEframework, LeanIX supports strategic assessment of the portfolio. Recent investments in AI/ML technology allow users to inquire about the state of the application portfolio through a chat interface, leveraging ChatGPT technology.
- **Advanced Roadmapping:** LeanIX supports roadmapping at the capability and application levels, as well as for all fact sheet (architecture object) types, offering the ability to assess capability maturity in concert with application life cycle. The transformation fact sheet type provides a means to plan changes over time and can be aligned to objectives, risks and constraints. The BTM module provides a business strategy dashboard that offers a single view of the landscape of enterprise initiatives and their dependencies.
- **Solution Architecture Design and Delivery:** LeanIX provides a framework for standards and reference architectures to drive solution architecture through a set of templates. Visual modeling is done through an integration with diagrams.net, offering an improved user experience over the previous proprietary visual modeling interface. Solutions can be reviewed through an automated workflow, and surveys can be used to collect feedback. Initiative fact sheets can be used to track the status of solution architecture work and workflow.

- **Innovation and Sustainability:** LeanIX supports enterprise innovation by leveraging business architecture concepts, like objectives, capabilities, value streams and customer journey mapping, to identify opportunities for technology innovations that directly impact the business. An ESG capability map, developed in collaboration with PwC, is offered OOTB to support sustainability initiatives.

MEGA International

Primary EA Product: HOPEX, Version 5.2, released in March 2023, is delivered both as an on-premises and a SaaS offering. The key differentiators for HOPEX are its "app store" functionality, and the modular structure of its product, with distinct modules for solutions and information architecture, business process analysis (BPA), IT portfolio management, and IT strategic planning.

Use-Case Ratings:

- **Enterprise Transformation Management:** Users can leverage the transformation management view, which includes application governance, risk and compliance, and application inventory. Architects can assess technologies against potential business disruptions using a business model canvas, which can be drilled into. HOPEX allows for visualization and linkage of a specific initiative's value proposition and adjacent relationships. An interactive comparison feature enables the visualization of the difference between the as-is and potential future states. Using business analytic integrations, architects can use preferred analysis tools to explore real time updates and metrics.
- **IT Portfolio Management:** HOPEX's business capability modeling feature supports capability-based investment planning and assessment. Using the application directory, users can view and edit attributes such as compliance, business value and expenses, as well as view associated diagrams and costs. HOPEX allows for Microsoft Office content import via templates, as well as ServiceNow mapping integrations, and includes an AI-driven APM feature that allows automated building of application inventory and can check which applications support processes across organizations and initiatives.

- **Advanced Roadmapping:** HOPEX allows for an aggregated dendrogram visualization while viewing a strategic roadmap, which enables simple navigation of nesting initiatives. Architects can display a detailed Gantt chart of projects and their deliverables, which can be further drilled down for granular views, including milestones and life cycle information. Users can plot assessment data like business value, strategic alignment, cost and risk on a graph, which can then be further defined and compared.

- **Solution Architecture Design and Delivery:** HOPEX provides one repository for enterprise architects, solution architects and developers to work collaboratively on initiatives. Solution diagrams can be compared using an interactive slider, which shows all changes between versions. Templates for deployable packages speed up diagramming for commonly used patterns. Diagrams can be shared and discussed in Microsoft Teams, allowing for a more user-friendly engagement model, depending on stakeholder familiarity.

- **Innovation and Sustainability:** HOPEX includes design thinking features such as idea creation, which can be submitted with a varying degree of detail and be reviewed via assessments with custom criteria. Visualization options like word clouds, heat maps, pie charts, matrices and bubble visualizations promote the reporting and communication of ideation output. Reports can be generated (regardless of visualization) and used to compare and contrast ideas.

North Highland (UMT360)

Primary EA Product: NH360 Strategic Portfolio Manager, version 6.7, released April 2022, is only delivered as a SaaS offering based on Microsoft Azure. It consists of two modules, NH360 Enterprise Connect and NH360 Portfolio Insights, to provide enterprise and business architecture capabilities and strategy and execution capabilities, respectively. Its key differentiators are its extensive support for strategic portfolio management, features to manage EA services and the time slicer feature.

UMT360 was acquired by North Highland, a change and transformation consultancy firm, in June 2023. The acquisition was formalized after closure of the 2023 Enterprise Architecture Critical Capability research process, and is not included in this analysis.

Use-Case Ratings:

- **Enterprise Transformation Management:** North Highland leverages a combination of their Strategy and Architecture Hubs to define strategic objectives and how these connect to and influence enterprise transformation products and initiatives. Business and IT assets, such as capabilities and applications, can be mapped to business models and value stages, and then onto transformation initiatives. The integration of these two hubs provides clients with the ability to track business objectives with value metrics, which are embedded across different layers up to the project level.

- **IT Portfolio Management:** North Highland positions business capabilities at the heart of defining and managing the IT portfolio. Through the Architecture Hub, clients can define business capabilities and their relationship to enablement of IT resources, together with an assessment of the maturity of people, process, data and technology capabilities. The ability to roll forward enables clients to visualize how the IT portfolio has addressed maturity gaps over time. Initiatives can be defined and mapped to objectives, and capability gaps, including dependencies across project milestones. The product also supports governance workflows, which can send automated notifications to assigned owners.

- **Advanced Roadmapping:** North Highland recommends extending their metamodel with the addition of a "Trends" custom object and new relationships to the OOTB object types of "Solution Domain" and "Threats," to support the initial analysis for roadmapping. The ability to connect strategic objectives to trends, threats and solution domains enables clients to establish a strategic line of sight from design to roadmap development and execution. To visualize how trends and threats can influence the strategic capabilities network, the technology landscape and initiatives, North Highland recommends a custom universal model diagram.

- **Solution Architecture Design and Delivery:** North Highland leverages solution domains within its Architecture Hub to support clients. Solution architects (SAs) can define capabilities, as well as and select architecture building blocks (ABBs) and solution building blocks (SBBs), together with constraints, assumptions, standards and specifications, to produce a solution design. Through their OOTB metamodel, SAs can demonstrate how solution ABABs support enterprise process models. Alternative solution design relationships can be achieved through metamodel extension.

- **Innovation and Sustainability:** North Highland recommends connecting all enterprise demands, whether ideation, innovation or established projects, back to the strategic portfolio. Using the Strategy Hub, clients can define metrics and success criteria for objectives, including connecting these to innovation themes and initiatives via the Portfolio Hub. The embedding of workflows guides ideation to maturity, with support for capturing related risks or impacts via surveys. The product supports customer journey maps with features to capture sentiments at each stage. Although there is not dedicated support for ESG, sustainability metrics can be set up using its support for maturity assessments.

Orbus Software

Primary EA Product: OrbusInfinity, Version 1.81.2, released June 2023, is only offered as a SaaS solution. Its key differentiators are the deep integration of Microsoft 365 applications, and its Solutions Hub, which provides a growing catalog of self-service extensions that customers can instantly deploy to their OrbusInfinity environment. Their Solution Hub marketplace leverages Microsoft iPaaS capabilities to offer clients a broad range of use cases.

Use-Case Ratings:

- **Enterprise Transformation Management:** OrbusInfinity leverages business motivation modeling (BMM) and business capability modeling to guide strategy, objectives and outcome definitions. Inbuilt ideation capabilities enable clients to define initiatives to support strategy execution, while integration with Microsoft 365 supports stakeholder engagement, collaboration and validation. Risk and opportunities analysis, coupled with OneTrust integration, enables clients to rank the risk and viability of candidate initiatives. Integration with PPM tooling transitions candidate initiatives to a digital transformation portfolio.

- **IT Portfolio Management:** OrbusInfinity enables clients to catalog and visualize their application and technology estate from a variety of dashboard perspectives, such as capabilities, process, data, cost and infrastructure. The ability to define product and project initiatives, including mapping out required resources and dependencies, enables clients to formalize the IT portfolio and roadmaps. Integration with PPM tooling also allows clients to track and update portfolio data across the enterprise.

- **Advanced Roadmapping:** OrbusInfinity enables clients to leverage enterprise strategic, threat, trend and current-state information to conduct SWOT and PESTLE analysis. OKR analysis can be used to define business-outcome-focused roadmaps. The out-of-the-box SharePoint-based Outcome Roadmap template allows clients to build and present a strategic-level enterprise roadmap. Clients can define drill-down roadmaps for a range of views and domains by aligning proposed and current initiatives to strategic objectives and targeted results.

- **Solution Architecture Design and Delivery:** OrbusInfinity aligns with agile and DevOps methods to define and guide the realization of solutions in an agile setting through to delivery. It also provides a baseline SharePoint-enabled model repository for solution architects (SAs) to search for, reuse and clone reference artifacts in new projects. Branching capabilities enable SAs to change base models and artifacts, such as design and deployment patterns, to meet new context needs and still support traceability and impact analysis across design and delivery. Using the integrated Visio app, SAs can reuse design pattern objects to build a range of architecture diagrams by having direct access to the model repository.

- **Innovation and Sustainability:** OrbusInfinity enables clients to define, structure, manage and track innovation by using its baseline capabilities and model repository. Integration with Microsoft 365 apps provides the ability to collaborate, submit, rank and prioritize drivers and ideas, including the importing of ideas and alignment to international standards, such as the U.N. Sustainable Development goals (SDGs). OOTB technology radars and roadmaps help to analyze trends and opportunities, and identify which technologies support key SDGs .

QualiWare

Primary EA product: QualiWare X, Version 10.8, released January 2023, is available on-premises and via public and private cloud. Its key differentiators include a continued focus on process modeling, 3D visualizations, formal support for digital twin of the organization, and support for business users and non-EA stakeholders.

Use-Case Ratings:

- **Enterprise Transformation Management:** Qualiware X provides the ability to track changes and trends, and offers a unique 3D visualization capability for interacting with repository data. Trends can be mapped to capabilities and initiatives to define transformative initiatives, linking them to business objectives. It offers different workspaces to support different roles in the organization, providing users with a filtered view of object types and functionalities, focused to fit their role.

- **IT Portfolio Management:** Qualiware X supports the management of the IT portfolio as a function of risk and application management. A risk register allows users to track risks associated with a given application or technology component in the portfolio, which can then be indirectly associated with capabilities, initiatives and other object types. Through object versioning, users can perform scenario-based planning of changes to the portfolio. OOTB integration with Azure DevOps allows users to push tasks to agile teams.

- **Advanced Roadmapping:** Qualiware X supports roadmapping, using concepts such as threats and opportunities to plan changes that respond to business needs. Roadmapping can be driven by the delivery of capabilities through definition of initiatives, dependencies and timelines. Versioning allows for the creation of multiple roadmaps to compare options, and dashboard views provide an overview of initiative status at a glance.

- **Solution Architecture Design and Delivery:** Qualiware X provides its own template for solution design, but also supports ArchiMate and other modeling languages. Multiple modeling languages can be used simultaneously with a single repository and metamodel to support the needs of different stakeholders. The 3D visualizer feature allows users to better understand relationships across models, regardless of the visual language used. Qualiware X provides support for requirements definition, as well as decision models that support traceability from design to business objectives. Compliance audit capabilities allow users to ensure that specific methodologies are followed as part of the delivery process, providing an audit trail of compliant activities.

- **Innovation and Sustainability:** Qualiware X supports ideation through an idea management pipeline, allowing for crowdsourcing of ideas that can then be linked with objects in the repository to understand the impacts and benefits of the ideas. Ideation is enhanced by advanced customer journey mapping capabilities, which includes an animated presentation mode. Sustainability is supported through the definition of sustainability goals in alignment with the U.N.'s Global Compact and Sustainable Development goals.

Software AG

Primary EA Product: Alfabet, Version 10.15, released in October 2022, is available on-premises and in public/private cloud deployments. A long history of deployments in a wide variety of scenarios has driven extensive functionality in Alfabet. Its key differentiators include automatic data translation, extensive configuration capabilities, and AI-driven insight generation.

Use-Case Ratings:

- **Enterprise Transformation Management:** The strategy management view offers the ability to view strategy, investment and timeline information, which can align to user-defined goals and objectives. Users can also populate trends across different strategic objectives, which can be drilled through to provide contextualized information based on category type. Alfabet offers the ability to track KPIs across a wide array of views and trends, with options to flag progress/risk indicators. An ecosystem model view is available out of the box with accompanying relationships, application linkages and suggested actions. Alfabet further includes dynamic capability mapping, using assessments to determine gaps, costs and experience indicators.
- **IT Portfolio Management:** Alfabet offers users the ability to create a dashboard with widgets that include recent portfolio changes, data completeness and asset responsibilities. The application workbench allows for the refinement of metadata associated with individual applications, including assigning owners and updating statuses to better track ownership and accountability. A Business Questions dashboard view allows for exploration and analysis of business-aligned interests, as well as a portfolio comparison, which includes a wizard feature for deeper customization.
- **Advanced Roadmapping:** The strategy breakdown view includes business outcome timelines, responsibility matrices, associated documents and base attributes. Drill-through roadmap features include the display of architecture and investments associated with a specific strategic theme. Alfabet provides the ability to generate a variety of roadmapping related views (such as impacts, funding and trends). It also allows for customizable comparison and forecasting of roadmaps, with an integrated wizard to refine setup.

- **Solution Architecture Design and Delivery:** Users can navigate a multifaceted dashboard, which supports project, product, or hybrid initiatives. There are numerous agile methodology features, which include story point and velocity tracking, resource allocations, and a feature backlog. Architecture models can be added to initiatives and assigned specific context for enhanced reusability and understanding. Users can also perform an overlap analysis to navigate how initiatives may impact existing architecture.
- **Innovation and Sustainability:** Alfabet offers views including innovations, ideas, trends, patents, strategy, business capabilities and business processes. A technology innovation roadmap radar allows for the classification and analysis of trends and their impact, as well as the associated risk/benefit/effort to an organization. Alfabet includes a business survey feature, which allows non-EA stakeholders to signal priorities and perceived importance of specific trends. Business and technology innovations can be linked, and embedded Gartner Hype Cycles further visualize trends in specific sectors. Detailed journey mapping is also available, along with jobs to be done, gains and pains, and value propositions. For ESG efforts, users can rely on a sustainability dashboard that features heat maps, product compositions and assessment-driven analysis.

UNICOM Systems

Primary EA product: UNICOM System Architect suite, Version 11.4.10.2, released April 2022, is delivered on-premises, via private cloud or installed on a stand-alone basis. It includes a fat client modeling tool, a web-enabled client (System Architect XT) and a publisher tool. UNICOM's primary focus is on the U.S. federal market. UNICOM licenses a separate PPM tool, Focal Point, that was not included in this assessment.

Use-Case Ratings:

- **Enterprise Transformation Management:** System Architect supports enterprise transformation through management of initiatives that are tied to objectives. Using the business motivation model and TOGAF business model diagram, users can understand the opportunities for and impacts of transformation initiatives.
- **IT Portfolio Management:** System Architect provides interfaces for management of the application and IT portfolio through tabular data as well as visual modeling. Full application portfolio management capabilities require integration with UNICOM's Focal Point too, which is not included in this evaluation.

- **Advanced Roadmapping:** System Architect supports the creation of roadmaps and Gantt charts to achieve a desired future state and provides functionality for visualizing multiple futures. Users can analyze differences and change by creating separate reports. Scenarios can be merged with the current state to update to a new baseline.
- **Solution Architecture Design and Delivery:** System Architect primarily supports solution design through Unified Modeling Language (UML) 2.5 and Object Management Group (OMG) SysML 1.6 diagramming. A full complement of TOGAF-based artifact templates are supported OOTB. Standard icon sets are available to overlay specific architectures (AWS, Azure, Google, etc.).
- **Innovation and Sustainability:** System Architect XT, the web client, is used to capture information from employees within the organization. Users can create and define new ideas and all associated metadata. Ideas are manually created, not solicited via surveys. The rich client supports the curation, grouping and analysis of ideas. Ideas can be connected to branches of the architecture and modeled.

ValueBlue

Primary EA Product: BlueDolphin, Version Hector.1, released July 2023, is delivered solely as a SaaS solution. The product is based on an underlying NoSQL database with a single-page application user interface built on top of a microservice cluster. Its key differentiators include rapid onboarding for new users, modular repository structuring (to account for organizational change) and intentional inclusion of many non-EA user personas.

Use-Case Ratings:

- **Enterprise Transformation Management:** Users can populate (manually or from industry reference models) a trend radar to identify industry-specific trends (which are stored as objects in the repository), realization timeframes and level of impacts expected. BlueDolphin includes a business motivation model that helps users visualize goals, outcomes and strategies related to specific initiatives. As the strategy progresses, stakeholder input can be gathered using a questionnaire form, which can then be analyzed to understand changing priorities. Using a business model canvas, users can explore relationships and interdependencies within capabilities and objects.

- **IT Portfolio Management:** User profile views are role-specific, limiting the content to what is relevant for the job at hand. Users can create an application portfolio landscape to visualize the current-state portfolio, using questionnaires to source information. Architects can also use captured metadata to explore interdependencies and opportunities within the portfolio. BlueDolphin has several OOTB templates with business analytics tools, which can utilize heat maps, TIME assessments, application life cycles, and Gantt charts to further analyze and manage the IT estate.

- **Advanced Roadmapping:** Users can create a SWOT analysis, which allows for prioritization across an organization, and can be custom colored, modeled and linked to ensure the proper context is available to all users. Users can create a strategic roadmap view that contains short-, medium- and long-term horizons, populated by objects in the repository. A Microsoft Power BI integration can be used to aggregate data in order to deliver a unified view for specific stakeholders and scenarios. Using the roadmap signoff workflows feature, users can help track accountable parties during the architecture work phases, and ensure continuity across multiple initiatives.

- **Solution Architecture Design and Delivery:** Modeling within BlueDolphin can be performed by both EA and non-EA personas, with the intent of business context being provided by external participants. There is also a drag-and-drop functionality within the modeling tool for simplified solution creation. Using a customer motivation view, an architect can further understand stakeholders and their concerns, goals, outcomes and critical requirements. Users have access to customizable iconography, which can be used to enhance visuals, and aid non-EA users' understanding and engagement. Models can be linked to initiatives and shared to stakeholders for review and analysis.

- **Innovation and Sustainability:** ValueBlue provides an idea radar to capture and visualize innovation ideas. Innovation flowcharts allow for analysis of ideas, sorting them against business or IT priorities, support for the decision to invest or ignore, and when selected, how to implement. It also offers dedicated workspaces to link ideas to business and IT capabilities, and create business cases from the ideas and capabilities for review and analysis. BlueDolphin further provides for relationship mapping between goals and business capabilities to provide additional clarity on interdependencies between initiatives. An ideation dashboard allows users to present ideas (including innovation and sustainability) with associated benefits, risks and costs.

Context

Between August 2022 and August 2023, Gartner received approximately 840 inquiries from clients asking how to select, configure and leverage EA tools, representing a 39% increase over the previous year. Regardless of whether they are buying their first EA tool or are current users looking for something better, clients see EA tools as critical to the delivery of services to support their organizations' strategic, tactical and operational goals. In the beginning, organizations want to capture interdependencies between their operations, applications and technology systems. EA tools also help the organization make better decisions, deliver more effective change and transform itself. The tools enable the organization to take a wider perspective, beyond the siloed needs of an individual function or business area.

The selection process for an EA tool should involve performing a thorough RFP and proof of concept (POC) to ensure that any prospective solution meets the requirements, practices and needs of the roles and skills across the organization. This Critical Capabilities report provides a granular framework, within which customers can assess the functionality of the tools. It should not be used in isolation, but in combination with the Magic Quadrant for Enterprise Architecture Tools. Gartner's Magic Quadrant and Critical Capabilities reports complement each other. The Magic Quadrant's analysis covers 15 dimensions across two axes: Ability to Execute and Completeness of Vision. Its objective is to help clients shortlist suitable vendors. The Critical Capabilities report centers on a single dimension — a vendor's product or service — on the Ability to Execute axis. It equates to a "double-click" drill-down, with a focus on the 12 functional capabilities that, in Gartner's view, are critical for supporting the major EA tool use cases.

Product/Service Class Definition

EA tools enable organizations to examine the need for, and impact of, change inside and outside the organization by:

- Capturing the relationships and interdependencies within and among an ecosystem of partners, operating models, capabilities, people, processes, applications and technologies.
- Providing a central repository catalog of data and metadata about the artifacts, objects and assets an enterprise cares about, and their related life cycles.
- Depicting models that represent the relationships among these objects. These models themselves are treated as assets that describe and shape the future of the enterprise.

- Helping with investment decisions at the level of IT and the broader enterprise.
- Combining with operational performance data to help improve business outcomes and shape the construction and ongoing development of digital platforms.

The functional capabilities that Gartner assesses as critical in support of an EA tool are listed in the Critical Capabilities Definition section.

Critical Capabilities Definition

Repository

An EA repository aims to provide a single source of truth for the organization with storage, categorization and versioning of objects and model primitives of various sorts. It also shows the relationships between them, and related business artifacts and views.

All vendors use a database of some sort to store data, with an extensible metamodel. This metamodel is at the core of the system, enabling enterprise architects to represent new classes and business concepts, as well as to design new metrics and relationships. Collectively, these features enable enterprise architects to represent the artifacts the business cares about, their attributes and the relationships between them. This structure provides a common language for the organization, helping to drive alignment and underpin decision making.

The key differentiators include:

- **Graph databases:** Traversal and retrieval of information across graphs is more rapid than joins in a relational database. This enhances the flexibility and agility to effectively store relationships and supports changing data models.
- **Leveling:** This helps enterprise architects represent value streams, and supports the aggregation of metrics and connection to portfolio analysis tooling to create transparency.

Modeling

Modeling is about structuring relationships across entities, such as business strategies, objectives, goals, constraints, capabilities, personas, customer journeys, activities, processes, value streams, policies, decision models, metrics, applications, technologies, roadmaps, projects and programs.

Most vendors provide simplistic process modeling and limited support for linking elements in the repository to defined business capabilities, goals, outcomes, strategies and objectives. Some vendors provide relatively sophisticated methods for modeling; others rely on separately licensed tools.

The key differentiators include the degree of support for:

- **Identifying dependencies and metadata:** Tools provide varying levels of support for capturing relationships among objects. Some come with direct support for common relationships, such as how a project, program or idea links to other repository components via named relationships. Other tools enable the definition of any sort of metadata or relationship; for example, assigning a maturity level to a capability or service, but only providing generic mechanisms for users traversing the repository.
- **Customer journey maps, value streams, ecosystem models and decision models:** Enterprise architects can capture an outside-in view of how the enterprise delivers customer value, using techniques such as business process model and notation (BPMN) and, increasingly, decision model and notation (DMN), linking these models to representations of customer journeys. Some tools provide rich support for these techniques; others have simplistic tooling, and others rely on this functionality from separately licensed partner products.
- **Aggregation of metrics:** Metrics may relate to just about any sort of object in the repository. Tools differ in the ways they track, link and aggregate metrics across various levels and taxonomies of these elements. For example, goals, objectives and business capabilities enable enterprise architects to capture customer satisfaction and directly reflect business value.

Analysis

Analysis tooling provides the ability to identify, assess, prioritize and track gaps, challenges, opportunities and risks within and across portfolios of business capabilities, investments, processes, projects, applications and technologies.

Features such as heat maps, gap analysis, basic scenario planning and risk indicators are common across all vendors. Collectively, these features enable enterprise architects to provide information and advice to their organization, supporting decision making around business investments and risks, as well as formulating effective responses to industry and technology disruptions.

The key differentiators include the degree of support for:

- **Analysis across multiple horizons and scenarios:** Tools take different approaches to support comparisons across various future states, described as plateaus (in the style of ArchiMate) or branches of the current state. These may include interactive visual exploration across elements in the repository, and the aggregation of costs across project and change initiatives.
- **Sophisticated assessments:** This refers to an extension of basic dashboards and portal technologies, where multiple analytical views automatically update based on selection or filtering in one pane. This helps enterprise architects to more easily construct analyses that fit business needs by extracting granular or high-level perspectives.
- **Comprehensive risk assessment:** This helps represent risks as components, create a risk catalog, set up acceptable limits and support aggregation across different levels. These risks are linked to other component types in the repository for qualitative and quantitative assessment, enabling enterprise architects to create mitigation plans.

Presentation

Displays and illustrations of information in the form of dashboards, heat maps, models and scenarios contribute to the presentation capability of the tool. This helps colleagues understand and assess the impacts associated with decisions and proposed solutions.

Almost all tools have OOTB dashboards to depict information related to portfolios of objects in the repository, such as applications, business capabilities and goals, in views such as tables, bar charts and bubble charts. Tool features vary in their sophistication and support for customization, interactive visualizations, type of canned dashboards and the ability to create new dashboards from scratch.

The key differentiators include the degree of support for:

- **Role-based and configurable dashboards:** In addition to canned role-based dashboards, support for configuring and personalizing those dashboards based on priorities is useful. Enterprise architects can leverage reporting and analysis widgets on dashboards with user-defined searches. These are enhanced with modern graph databases.

- **Interactive visualizations:** These provide an easy way to explore the repository and visualize the relationships, intersections and dependencies among repository elements from different perspectives. Views such as 3D or 2D graphs, chord diagrams, tree maps, navigable matrix diagrams and multidimensional roadmaps help enterprise architects visualize the impact of change.

Configuration and Management

This capability covers the setup and administration features to support the security of the EA tooling platform, along with the setup of different classes of users, their access rights and feature alignment. This also involves controlling access to information stored in the repository.

All vendors provide customizable OOTB roles and role-based access controls with support for single sign-on (SSO). They have access permissions tied to a role or a division, rather than at an individual user level. Most integrate with identity and access management (IAM) tools.

Key differentiators include the degree of support for:

- **Abstract access mechanisms:** Role-based access systems are just the starting point. Support for multiple inheritance and polymorphism is helpful in implementing more-complex access control mechanisms. These sorts of features are important in industries such as pharmaceuticals, research and the military.
- **SOC 2 Compliance:** From a security point of view, SOC 2 compliance for SaaS applications is becoming increasingly important. This certification tests how the vendor securely manages data to protect the interests and privacy of its customers. Few vendors have SOC 2 compliance, while some are midway through the certification process.

Extensibility

This involves extending the metamodel of the EA tool through the definition of new model primitives (concepts) and relationship types, up to new graphical representations and the enforcement of domain-specific rules. All vendors support extensible metamodels in some form.

The degree of sophistication in the extensibility of the tools varies significantly, ranging from a simplistic addition of new attributes for process or capability, through to designing and enforcing new graphical notations. Metamodel extension implies a deep understanding of the business domain and the implications of changing the primitives and the underpinning of the EA tools.

The key differentiators among tools include support for:

- **Accessibility:** The ease of understanding how the tool operates and the usability of the extension mechanisms themselves vary significantly. Key questions emerge, such as who the target user is, whether the extension mechanism itself relies on recursive and extensible structures, and how the semantics of the metamodel align with industry frameworks. Such advanced functionality implies careful access control.
- **Creation of domain-specific ontologies and methodologies:** Support for the creation of custom language and mapping of synonyms, unique data types, attributes and relationships enable customers to create a unique methodology that suits the needs of their specific organization.
- **Enforcing graphical notations:** The ability to extend object classes, underlying notations, relationship types and methodologies enables the organization to reflect its domain-specific context. Furthermore, these new extensions may need exposure in the standard graphical libraries, making them reusable across the UI.
- **Federated extensions:** In combination with sophisticated access controls, some tools provide OOTB mechanisms to support the extension of the organizational methodology for a specific part of a federated organizational structure. This can help users develop different viewpoints of the same content for different stakeholder groups.

Publication

Publication focuses on enabling the wide consumption of data contained within the EA tool, across the enterprise and beyond. This implies the ability to capture comments and feedback on that content, and/or score elements contained in repository views.

Although the ability to provide different classes of users with restricted access to the repository data is a core feature of all tools, the way that EA tools enable data consumption varies considerably. Personalized views, reviewing, tagging and notification features in different forms are common across all vendors. Some vendors provide capabilities to survey and capture feedback from non-EA stakeholders. Other vendors provide predeveloped processes to validate repository contents across different versions. Some vendors also provide secure APIs to publish content through third-party applications and dashboards, such as Microsoft Power BI. A few vendors take this a step further by delivering dynamic analysis content to stakeholders, along with scheduled alerts and reports. Delivering repository information via these sorts of integrations may have significant licensing cost implications.

Frameworks

Frameworks are a starting point for structuring the repository and the relationships among artifacts. EA tools can support different architectural methods and vertical industry models, and guide users in choosing which EA frameworks to adopt, and identifies overlaps and gaps.

Some vendors provide mechanisms to apply compliance and regulatory frameworks, such as those put forth by the National Institute of Standards and Technology (NIST), General Data Protection Regulation (GDPR) and the Sarbanes-Oxley Act (SOX). Most support industry architectural and process frameworks, such as those from the American Productivity and Quality Center (APQC), Department of Defense Architecture Framework (DoDAF), Banking Industry Architecture Network (BIAN), enhanced Telecom Operations Map (eTOM) and Association for Cooperative Operations Research and Development (ACORD). Most vendors extend consulting support to help customers understand gaps and select a suitable framework.

Integration

Integration mechanisms expose and import data to and from other products, enabling the EA tool to be a hub uniting other common tools in the enterprise technology ecosystem. This includes categories such as product management, CMDB, PPM, business process management suite (BPMS) and process mining.

Almost all vendors provide some OOTB integrations with external applications for product management, CMDB, ITSM, PPM, governance, risk and compliance (GRC) and/or BPMS. Virtually every tool provides extensible REST APIs, while several support GraphQL APIs. Some tools provide OOTB mechanisms to align imported data with the existing object structure, ensuring unique alignment between objects in the repository and these external data sources. Some vendors also provide bidirectional integration to keep external applications in sync; for example, most have some form of integration with ServiceNow, Technopedia and Jira. Others integrate with tools such as Microsoft Teams and Slack to ease collaboration and engagement of users across the enterprise. While most vendors provide basic Excel import and export, some vendors take this a step further by delivering intuitive interfaces and templates to support the import and export of data through Excel files. This can be quite helpful in the initial setup.

Key differentiators include the degree of support for:

- **Lossless import and data enrichment:** Sophisticated Excel-based import mechanisms and API-based data loaders are valuable when setting up a new tool or moving from an old version. Some of these tools take this a step further by automatically extracting column headers and aligning it with the metamodel, while others provide extraction, transformation and loading (ETL)-style enrichment mechanisms and/or validation wizards.
- **Interface builder for easy integration:** This sort of feature goes beyond Excel-based loaders and dedicated integrations. It enables enterprise architects to map external data sources to appropriate element types and fields in the EA tool. This eventually enables automated information exchange and better enables EA tools to play that tool hub role.

Intelligent Automation

Automation features help enterprise architects to industrialize their activities, delivering value more quickly and reliably while keeping information up to date and fresh. Here, we explore process and policy automation functionality used in the tool (rather than served up externally).

Most vendors have some sort of process support functionality integrated with their EA tool. This is usually in the form of “workflows” for common governance functions, and is not extensible or adaptable by the user organization.

Key differentiators include the degree of support for:

- **Automated attestation:** Automatically triggering attestations for repository content helps keep the repository up-to-date and avoids accumulation of irrelevant components or artifacts. These processes are usually triggered based on metadata about the life cycle of the application or technology, or some change that affects the component.
- **Custom EA processes:** A few vendors provide sophisticated tooling to enable organizations to create their own governance processes and procedures. This sort of dynamic workflow capability can include support for data-driven routing and work assignment, event-based triggers, approval by assigned individuals and survey management mechanisms.
- **Event correlation against streaming data:** A few tools provide support for real-time event correlation and analysis of real-time data feeds. This sort of functionality can then trigger alerts or processes and provide metrics aggregations, or link to deeper analytics to better support decision making by leaders and other stakeholders.

Innovation Management

This focuses on mechanisms that support the creation and tracking of innovation and change initiatives. This includes support for ideation, trendspotting, the engagement of colleagues, program and portfolio management links, and benefit realization.

Almost all vendors provide elementary features to capture an idea and link it to projects and initiatives. Most vendors support voting on or rating ideas, tagging individuals and commenting, as well as linking ideas to business outcomes, capabilities, processes and other objects in the repository. Having created relationships with these other items, users can then explore and navigate across the repository.

Key differentiators include the degree of support for:

- **Structured collection of ideas and advanced collaboration environments:** Capturing ideas, opportunities, trends, disruptions and emerging technologies helps open multiple starting points for innovation initiatives. Tools typically enable stakeholders to collaborate via embedded chats, annotate ideas and further flesh out a concept before incorporating it into a change initiative or project.
- **Design thinking:** Tools provide varying degrees of support for design thinking initiatives, such as the ability to create rich personas, capture jobs to be done and design customer journey maps. These sorts of features help participants focus and redesign their organizational products and services.

- **Mapping ideas to other elements in the repository and roadmapping:** These include objectives and outcomes, business capabilities, initiatives and products, and showcasing the delivery of value across value streams and the wider value chain. These linkages help ideas become part of the enterprise roadmaps based on agreed acceptance criteria.
- **Dashboards and idea funnels:** Dashboards capturing the business cost (or risk) of an idea can help stakeholders make better and more informed decisions. Some tools provide direct support for an "idea funnel" that helps the organization take a view across a portfolio of ideas and assess progress, allocate budgets, and complete other related tasks

Use Cases

Enterprise Transformation Management

EA practitioners need to produce and manage models that can help the enterprise understand how it needs to transform to changing strategy, objectives and outcomes.

Enterprise architects are often involved in:

- **Developing the shape and substance of transformation initiatives:** Inevitably, this means engaging business stakeholders with a primary focus on enabling business alignment and change, rather than the traditional scope of IT.
- **Supporting the business and facilitating stakeholders:** As they define the scope of change, enterprise architects help these stakeholders clarify their vision and identify the benefits and challenges, and conflicts and dependencies, as well as the roadmaps associated with getting there.
- **Helping colleagues develop and deploy new services/products:** Although these products usually focus on an organization's customers, they may also support other internal stakeholders.

The number of potential users of the EA tool for this use case is really quite large. Most will have little interest in dealing with the complexity and interdependencies of the business and IT domains.

IT Portfolio Management

EA practitioners need to use enterprise transformation models and other data to build, analyze, manage and recommend IT portfolios in preparation for execution.

Apart from cataloging the IT estate, this involves:

- **Assessing dependencies between applications and supporting technologies:** This involves capturing application characteristics and driving assessments, such as TIME-based assessments, to support the rationalization and modernization of the IT estate. (See Using TIME for Application and Product Portfolio Triage: Data From the Field for more information on TIME assessments.)
- **Ensuring proper governance of development projects:** Typically, this involves the creation of appropriate guidelines and guardrails for development teams. In more formal settings, it also implies support for how projects are initiated and signed off on.
- **Guiding projects' technology selection and rationalization:** Enterprise architects may need to ensure proper strategic technology principles and sourcing guidelines, and emphasize factors such as cost optimization, revenue growth and risk mitigation.

Advanced Roadmapping

EA practitioners need to build, present and communicate roadmaps that guide transformation, and investment decisions for a broad range of internal and external viewpoints.

Enterprise architects are often involved in:

- **Guiding investment planning and prioritization:** This covers using business and IT strategy, objectives and business outcomes to inform investment planning and prioritization.
- **Developing business and technology-focused roadmaps:** This covers the development and presentation of interconnected roadmaps for the prioritized delivery of business and technology capabilities, across a range of enterprise scenarios and viewpoints.
- **Governance of investments and associated roadmaps:** This covers effective due diligence and stakeholder engagement, to ensure both the strategic alignment and compliance of investment decisions and roadmaps.

Solution Architecture Design and Delivery

EA practitioners need to design and communicate consumable strategic, tactical and emergent solution architecture that is aligned to enterprise strategy and standards.

Enterprise architects are often involved in:

- **Supporting delivery teams with guardrails appropriate to their methodologies:** As organizations increasingly adopt agile and DevOps best practices methodologies, EA must move toward an adaptive model that provides services and deliverables that enable delivery teams to internalize architecture decision making.
- **Aligning solution design and delivery with strategic architectures:** This covers the ability to define solution designs and plan their delivery in accordance with enterprise strategic architectures, and their associated roadmaps and business outcomes.
- **Visibility of solution design and delivery decisions:** This covers everything from solution design and delivery to ensure decisions align with standards. It also necessitates the ability to look across all solution design engagements, and assess potential and benefits delivered (e.g., an EA benefits register).

Innovation and Sustainability

EA practitioners need to help organizations track and leverage emerging trends, technologies and sustainability advances through structured, flexible and iterative methods.

In many ways, the innovation use case is a linking use case for the “support change, transformation and optimization” use case. That use case is focused on how the EA tool helps the organization to develop and support innovation initiatives — specifically, leveraging new technologies and becoming more “digital.” This extends into how tools deliver a platform to enable innovation with structured, flexible and iterative methods and features to support the idea life cycle, as well as enable the collaboration of various stakeholders. We explored how the EA tool helps enterprise architects to:

- **Track ideas and concepts from ideation to commercialization:** This involves developing innovation roadmaps to capture changing strategies and innovation opportunities. This also means managing the pipeline and portfolio of ideas/concepts and the ability to create metadata around each, against which enterprise architects might assess potential cost, risk and the like.

- **Support business and technology stakeholders as they design their futures:** This means supporting how organizations apply design thinking techniques, such as designing a desired customer experience or developing a new way of doing things. It implies features to embed sustainability principles into business design, and features to track and aggregate sustainability metrics, such as ESG.
- **Align with in-flight projects and predict interdependencies, relationships and business outcomes:** Stakeholders need a visual representation of the state of change relative to plans, in-flight efforts and existing assets, given strategic goals, strategies, missions and/or objectives.

Vendors Added and Dropped

No vendors were added to or dropped from this year's Critical Capabilities report.

Inclusion Criteria

Table 1: Weighting for Critical Capabilities in Use Cases

(Enlarged table in Appendix)

Critical Capabilities	*Enterprise Transformation Management*	*IT Portfolio Management*	*Advanced Roadmapping*	*Solution Architecture Design and Delivery*	*Innovation and Sustainability*
Repository	18%	10%	17%	10%	5%
Modeling	25%	15%	0%	10%	8%
Analysis	14%	15%	10%	15%	10%
Presentation	8%	15%	15%	10%	10%
Configuration and Management	5%	0%	7%	5%	5%
Extensibility	4%	0%	0%	10%	5%
Publication	6%	10%	10%	10%	17%
Frameworks	10%	5%	10%	5%	0%
Integration	5%	10%	16%	10%	5%
Intelligent Automation	5%	10%	10%	5%	5%
Innovation Management	0%	10%	5%	10%	30%

Source: Gartner (November 2023)

This methodology requires analysts to identify the critical capabilities for a class of products/services. Each capability is then weighted in terms of its relative importance for specific product/service use cases.

Each of the products/services that meet our inclusion criteria has been evaluated on the critical capabilities on a scale from 1.0 to 5.0.

Critical Capabilities Rating

Table 2: Product/Service Ratings on Critical Capabilities

(Enlarged table in Appendix)

Critical Capabilities	Ardoq	Avolution	Bee360	Bizzdesign	BOC Group	Capsifi	Enterprise Architecture Solutions	LeanIX	MEGA International	North Highland (UMT360)	Orbus Software	QualiWare	Software AG	UNICOM Systems	ValueBlue
Repository	4.7	4.6	2.4	4.0	3.8	4.6	3.9	4.4	4.0	2.8	3.7	3.9	3.9	2.5	3.0
Modeling	4.4	4.6	3.0	4.3	4.3	4.6	3.8	3.8	4.2	3.4	3.9	3.9	4.1	2.6	2.8
Analysis	4.5	4.5	3.4	4.4	4.2	4.3	4.0	4.2	4.4	2.8	3.4	3.7	4.2	2.6	2.7
Presentation	4.6	4.6	2.9	4.2	4.5	4.3	4.0	4.2	4.1	3.3	3.7	3.9	4.3	3.0	3.1
Configuration and Management	3.8	4.2	2.7	4.2	4.4	3.7	3.9	4.0	4.2	3.5	3.9	3.3	3.9	2.1	2.9
Extensibility	4.2	4.4	2.4	4.1	4.2	4.3	3.6	4.3	3.4	2.0	3.8	4.1	3.9	1.8	3.7
Publication	4.4	4.0	3.7	4.5	3.8	4.2	3.7	3.6	3.6	2.6	3.6	3.7	4.1	3.2	3.8
Frameworks	3.1	4.3	1.0	4.1	4.1	4.0	3.7	3.5	3.2	2.2	4.2	3.9	4.2	3.2	3.4
Integration	4.3	4.1	2.8	4.1	3.8	4.1	3.9	4.3	4.2	3.0	3.9	4.1	3.9	3.8	3.4
Intelligent Automation	4.2	4.6	3.0	4.5	4.0	4.0	3.1	4.4	4.1	1.5	3.8	3.8	3.8	1.7	2.1
Innovation Management	3.9	4.5	3.1	4.4	4.3	4.1	3.3	3.8	3.6	2.6	4.2	3.9	4.1	1.9	3.2
As of 2 November 2023															

Source: Gartner (November 2023)

Table 3 shows the product/service scores for each use case. The scores, which are generated by multiplying the use-case weightings by the product/service ratings, summarize how well the critical capabilities are met for each use case.

Table 3: Product Score in Use Cases

(Enlarged table in Appendix)

Use Cases	Ardoq	Avolution	Bee360	Bizzdesign	BOC Group	Capsifi	Enterprise Architecture Solutions	LeanIX	MEGA International	North Highland (UMT360)	Orbus Software	QualiWare	Software AG	UNICOM Systems	ValueBlue
Enterprise Transformation Management	4.30	4.47	2.73	4.23	4.12	4.34	3.81	4.04	4.01	2.87	3.78	3.84	4.06	2.67	3.00
IT Portfolio Management	4.33	4.45	2.95	4.29	4.13	4.28	3.75	4.06	4.02	2.79	3.78	3.86	4.08	2.70	3.01
Advanced Roadmapping	4.26	4.39	2.75	4.23	4.06	4.20	3.78	4.11	3.97	2.74	3.79	3.84	4.04	2.80	3.08
Solution Architecture Design and Delivery	4.28	4.41	2.88	4.26	4.13	4.25	3.76	4.07	3.95	2.75	3.79	3.86	4.06	2.62	3.13
Innovation and Sustainability	4.24	4.40	3.09	4.33	4.16	4.21	3.64	3.97	3.87	2.74	3.85	3.83	4.08	2.48	3.17

Source: Gartner (November 2023)

To determine an overall score for each product/service in the use cases, multiply the ratings in Table 2 by the weightings shown in Table 1.

Acronym Key and Glossary Terms

ACORD	Association for Cooperative Operations Research and Development
APM	Application Portfolio Management
BMM	Business Motivation Model
BPMN	Business Process Management Notation
CMDB	Configuration Management Database
DMN	Decision Management and Notation
DoDAF	Department of Defense Architecture Framework
ESG	Environmental, Sustainability and Governance
GDPR	General Data Protection Regulation
ITSM	IT Service Management
NIST	National Institute of Standards and Technology
OKR	Objectives and Key Results
OMG	Object Management Group
OOTB	Out of the Box
PESTLE	Political, Economic, Social, Technological, Legal and Environmental
PPM	Project and Portfolio Management
REST	Representational State Transfer
SOC 2	Systems and Organization Controls Type 2
SWOT	Strengths, Weaknesses, Opportunities and Threats
TIME	Tolerate, Invest, Mitigate, Eliminate
TOGAF	The Open Group Architecture Framework

Critical Capabilities Methodology

This methodology requires analysts to identify the critical capabilities for a class of products or services. Each capability is then weighted in terms of its relative importance for specific product or service use cases. Next, products/services are rated in terms of how well they achieve each of the critical capabilities. A score that summarizes how well they meet the critical capabilities for each use case is then calculated for each product/service.

"Critical capabilities" are attributes that differentiate products/services in a class in terms of their quality and performance. Gartner recommends that users consider the set of critical capabilities as some of the most important criteria for acquisition decisions.

In defining the product/service category for evaluation, the analyst first identifies the leading uses for the products/services in this market. What needs are end-users looking to fulfill, when considering products/services in this market? Use cases should match common client deployment scenarios. These distinct client scenarios define the Use Cases.

The analyst then identifies the critical capabilities. These capabilities are generalized groups of features commonly required by this class of products/services. Each capability is assigned a level of importance in fulfilling that particular need; some sets of features are more important than others, depending on the use case being evaluated.

Each vendor's product or service is evaluated in terms of how well it delivers each capability, on a five-point scale. These ratings are displayed side-by-side for all vendors, allowing easy comparisons between the different sets of features.

Ratings and summary scores range from 1.0 to 5.0:

1 = Poor or Absent: most or all defined requirements for a capability are not achieved

2 = Fair: some requirements are not achieved

3 = Good: meets requirements

4 = Excellent: meets or exceeds some requirements

5 = Outstanding: significantly exceeds requirements

To determine an overall score for each product in the use cases, the product ratings are multiplied by the weightings to come up with the product score in use cases.

The critical capabilities Gartner has selected do not represent all capabilities for any product; therefore, may not represent those most important for a specific use situation or business objective. Clients should use a critical capabilities analysis as one of several sources of input about a product before making a product/service decision.

Document Revision History

Critical Capabilities for Enterprise Architecture Tools - 13 December 2022

Critical Capabilities for Enterprise Architecture Tools - 22 November 2021

Critical Capabilities for Enterprise Architecture Tools - 14 December 2020

Critical Capabilities for Enterprise Architecture Tools - 16 December 2019

Critical Capabilities for Enterprise Architecture Tools - 24 October 2018

Critical Capabilities for Enterprise Architecture Tools - 27 February 2018

Critical Capabilities for Enterprise Architecture Tools - 9 January 2017

Critical Capabilities for Enterprise Architecture Tools - 7 December 2015

Recommended by the Authors

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

How Products and Services Are Evaluated in Gartner Critical Capabilities

Magic Quadrant for Enterprise Architecture Tools

8 Steps to Select and Obtain Value From Enterprise Architecture Tools

Infographic: Developing a Business Case for EA Tools With User Stories

Digital Business Strategy and Plans Primer for 2023

Digital Business Change Initiatives Primer for 2023

Enterprise Architecture Function Primer for 2023

Hype Cycle for Enterprise Architecture, 2023

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Integration	4.3	4.1	2.8	4.1	3.8	4.1	3.9	4.3	4.2	3.0	3.9	4.1	3.9	3.8	3.4
Intelligent Automation	4.2	4.6	3.0	4.5	4.0	4.0	3.1	4.4	4.1	1.5	3.8	3.8	3.8	1.7	2.1
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