Quadrant Knowledge Solutions

Data, Analytics, and AI

SPARK Matrix™: Enterprise Architecture (EA) Tools, 2022

Market Insights, Competitive Evaluation, and Vendor Rankings

September 2022

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Executive Overview

This research service includes a detailed analysis of the global Enterprise Architecture (EA) Tools market dynamics, major trends, vendor landscape, and competitive positioning analysis. The study provides competition analysis and ranking of the leading enterprise architecture tools vendors in the form of the SPARK Matrix. This research provides strategic information for technology vendors to better understand the market supporting their growth strategies and for users to evaluate different vendors' capabilities, competitive differentiation, and their market position.

Key Research Finding

Following are the key research findings:

Market Drivers and Trends:

The enterprise architecture platform market is expected to grow significantly in the next five to six years, considering that most industry verticals are focusing on digital transformation and improving customer satisfaction through automated application offerings. Quadrant analysts believe that enterprise architecture platforms offer agile and collaborative development environments for business users and professional developers. The platform also allows them to design, build, preview, develop, modify, and control applications with a multi-experience development process in real-time.

The enterprise architecture tools vendors offer a platform that enables users by shifting the burden from computing to the edge, where-in the platform makes it possible for increased utilization of hybrid cloud for the microservices experience. The enterprise architecture platform extends to multiple users by incorporating DevSecOps into the agile framework and allowing acceptance of continuous integration and delivery. The enterprise architecture provides hyper automation and more effective deployment using AIOps as well. The Enterprise Architecture platform market also shows significant growth potential because of offerings that include business-driven architecture, application rationalization, big data capability, cloud migration, incorporating microservices intelligence, customizable solutions, and API management, amongst other things.

The vendors are also strengthening their capabilities by leveraging cutting-edge technologies like out-of-the-box data modeling and reporting, intuitive UI with ease of usability, collaborative workflows, data management, governance, compliance management, risk management, business continuity management, rationalization, and application portfolio management, amongst others. These help in addressing the unique challenges that the organizations face and assist in shortlisting the best investment options to drive desired business growth.

Competition Dynamics & Trends:

Mega International, LeanIX, BiZZdesign, Software AG, QualiWare, erwin by Quest, ValueBlue, Bee360, Planview, and Enterprise Architecture Solutions are the top performers in the EA tools market and have been positioned as the top six technology leaders in the 2022 SPARK Matrix analysis of the global EA tools market. These vendors provide a comprehensive technology platform with automated and integrated technology offerings and strong EA tools functionalities to help organizations promote efficient and rapid application development processes by business users and IT professionals.

The study includes analysis of other major vendors, including Ardoq, Avolution, BOC Group, Capsifi, Orbus Software, and Unicom Systems.

Market Definitions and Overview

Quadrant Knowledge Solutions defines Enterprise Architecture (EA) tools as "a set of applications or a platform that assists organizations in strategically driven planning, analysis, design, execution, and implementation of business strategies across different operating domains such as IT, technology, and business." They also align business processes with information systems and IT Infrastructures to support strategic and tactical decision-making and provide complete IT transparency with enhanced usability and collaboration across the organizational departments.

EA tools identify the impact of change on business, technology, data, and application architecture by capturing interdependencies and relationships between processes, products, data, people, frameworks, functional capabilities, and others to create and deliver value. Enterprise Architecture Tools ensure rationalizing of application portfolios, robust data privacy and governance policies, development of agile architecture, architectural modeling, and optimizing business operations for executing business objectives, vision, and strategy, as well as mitigation of technology risks. Additionally, EA tools manage emerging technologies to support the organization's use of data, analytics, and artificial intelligence for monitoring, execution, and management of digital-driven business investments.

While Enterprise Architecture (EA) remains a key discipline essential for building disruption-proof business outcomes, recent factors such as accelerated digitization have led organizations to realize the need to extend the philosophy to the entire business and not just to the IT infrastructure, to ensure that the businesses are aligned with the digital transformation strategies and technological growth. EA mainly focuses on bringing legacy processes and applications together to form a seamless environment for businesses to achieve their desired goals. Enterprise architecture helps organizations lay out how information, business, and technology flow together to provide a comprehensive view of the inter-relationships within the organizational IT and business processes.

Additionally, EA also provides a roadmap for the progression of the IT landscape from its current state to the desired state, along with the transitional states in between. EA also aids in the standardization of processes and applications, resulting in greater stability. These standardized processes increase operational

efficiency while lowering potential future risks. Therefore, organizations are using EA platforms to standardize and arrange IT infrastructure in a way that supports operational objectives and also assist in the modernization, growth, and transformation of organizational IT departments.

EA is also emerging as an effective tool for holding an architecture repository as well as a platform to generate, manage, and share architecture because of its pragmatic modeling approach. In addition, EA Tool vendors are continuing to strengthen their capabilities by leveraging cutting-edge technologies such as out-of-the-box data modeling and reporting, intuitive UI, advanced visualization, advanced analytics, multi-discipline team collaboration, robust data quality, and governance, amongst others. The EA tool vendors are also making significant investments in incorporating artificial intelligence (AI) and machine learning technologies to provide NLP and NLQ-driven assistant bots, AI-powered intelligent insights and user experience, and such others. Vendors are using AI and deep learning in the relevant context of the architecture in various fields of application, including image recognition, linguistic translation, transformation of models, natural language processing, data normalization, metadata and recognition of business patterns, risk analysis, and others.

EA tool vendors are also focusing on expanding their technology partner ecosystem to offer seamless integration and interoperability with a wide range of third-party applications. The vendors are also offering technology differentiators, including enterprise-level access controls such as asset and role-based access controls, LDAP integration, IP address restriction, single sign-on, ease of integration (APIs/GraphQL, discovery, connectors), content-driven dynamic visualizations, integrated connected knowledge, and tighter integrations with agile and collaborative tools (Jira, Confluence, Teams, GitLab), amongst others. Moving forward, vendors would actively work towards providing further maturity within their artificial intelligence offerings for implementing continuous transformation strategies for organizations in line with adapting to the newer regulations, customer expectations, technologies, and others.

Some of the major Enterprise Architecture (EA) tools functionalities include repository, modeling, framework and standards, Integration architecture, data governance & security, application portfolio management, innovation management, decision analysis, and reporting and analytics.

The following is the description of each Enterprise Architecture (EA) tools functionality:

- **Repository:** A repository for Enterprise Architecture (EA) is a collection of artifacts which describes an organization's current and future IT landscape. Its purpose is to provide a central location for the storage and retrieval of architectural artifacts. An EA repository includes the architecture metamodel's key logical components, domains, principles, capabilities, governance documents, various types of models (conceptual, logical, physical) and relationship between them, and reference library. Enterprise architecture tool vendors provide a single repository which enables users to reuse the data across different use cases for better decision making, understand the impact and change, and provide the ability to define the future direction and transformation.

- **Modeling:** Enterprise architecture tools provide the modeling feature that enables users to view relationships among the elements with a strategic concern such as drivers, goals, and objectives. Moreover, the users can view this relationship in a diagrammatic or graphical presentation with a list of views, which further helps in creating an appropriate powerful communication mechanism for executives, managers, and other architects. Modeling also helps users to structure relationships between entities such as business strategies, objectives, goals, constraints, value streams, policies, decision models, metrics, applications, technologies, roadmaps, and projects.

- **Framework & Standards:** It Enterprise Architecture is governed through framework procedures and operating protocols that guide and direct the decision-making process. These decisions are further considered during the adoption, reuse, reporting, and exclusion of information technology in organizations. The frameworks and protocols of enterprise architecture mainly include principles, methods, procedures, metrics, best practices, and reference models, and are backed by the review status of enterprise architecture to oversee the implementation of the technology and governance strategy and framework definitions. Additionally, enterprise architecture tool vendors provide the policy protocol, definition assistance, design

framework, discipline of architecture implementation, and practices across the organizational setup.

- **Integration Architecture:** Efficient Integration architecture refers to organizations' IT landscape which simplifies the integration of numerous IT components, which enables users to trace the flow of data between applications. Integrating various software with enterprise architecture breaks down silos and enables various software applications to communicate with each other. Vendors also offer advanced functionalities to integrate and connect data from other systems and sources including configuration management database (CMDB), business process management, product and portfolio management, and others.

  Additionally, vendors offer API architecture which helps users to improve interoperability with third-party client's platforms, either through existing established integrations or through open API RESTful web services. This API architecture also enables to read and write integration capabilities for generic table interface for basic connections, OLEDB (object linking and embedding, database) and ODBC (open database connectivity) connectors to interrogate and integrate from external databases, WSDL (web services description languages), XML (extensible markup language), XMI (metadata interchange), and other connectors to enable interfaces with other technologies and others.

- **Data Governance & Security:** Data governance in enterprise architecture enables an organization to get a holistic view of data and manage it within the context of business processes, as well as to support application integration requirements. Data governance supports the ability to design and manage the creation, flow, and storage of data across all layers of architecture to categorize it and assists in managing security and privacy. Enterprise architecture vendors provide robust data governance and security features, which leads to significant acceleration of the process of collecting and compiling data and making it available in the right context. Vendors are continuously updating data security through automated workflows and making security specifications more transparent.

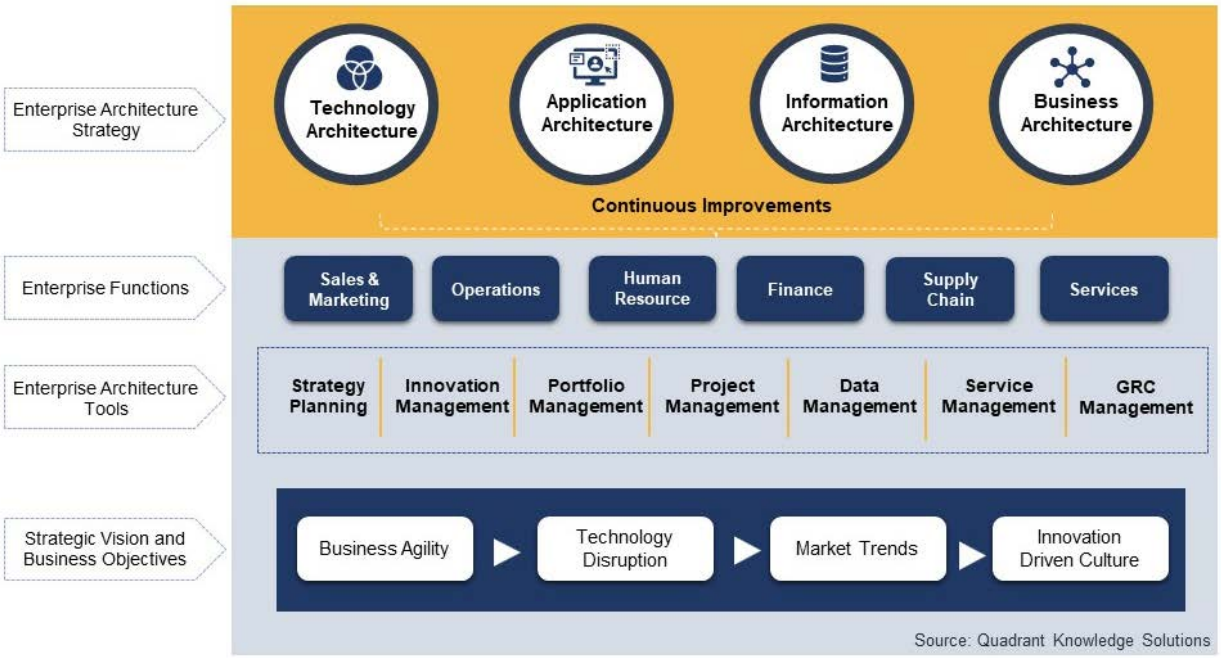
- **Application Portfolio Management:** Application Portfolio Management (APM) in the enterprise architecture platform provides a clear path for mapping applications and linking business domains and easily identifies gaps and overlaps in the application architecture. APM refers to the process of managing and optimizing software application inventories to meet specific business goals. Application Portfolio Management in EA tools platform initiates open views of IT application landscapes to assess IT costs, standardize software across business divisions, and foster agility and creativity. APM also assists organizations in managing all applications and evaluating their technical and business value to select which ones to preserve, upgrade, or terminate.

- **Innovation Management:** Innovation management in enterprise architecture refers to quickly and effectively implementing organization's goals through adoption of innovative ideas, products, processes, and business models. Enterprise architecture addresses transformational changes such as mergers/acquisitions, business and IT alignment, adoption of big data, IT outsourcing and other projects, and on the other hand, innovation management enables organizational teams to make the best synergies between enterprise architecture and innovation management. This drives businesses with strategic technology portfolios and combines strategy and innovation centrally, which helps an organization to propel towards digital growth opportunities.

- **Decision Analysis:** Decision analysis offers a wide range of internal tools such as decision tables, decision trees, and computer-based simulations, and it also offers considerations with accurate reasoning that help the architect to analyze the decisions. Additionally, the visual presentation of the information allows the architect to make accurate decisions in a complex environment. Furthermore, business rules can be visualized to reach and resolve complex problems in decision making, which is then linked up to the business processes to visualize where and when the decision is made. Therefore, the decision analysis process helps users to locate the root cause of the problems and the solutions in a graphical manner.

- **Analytics and Reporting:** Enterprise architecture tool vendors offer advanced analytics features that provide intuitive tools which allow users to use self-service analytics, including mapping of capability, heatmaps, and charts, and utilize all the data and relations in the repository. Additionally, they also provide advance querying, calculations, scripting, and risk and opportunity tracking, and extend their support to out-of-box integrations. Further, enterprise architecture tool vendors also offer robust reporting features with embedded ad-hoc reporting, interactive reporting, cross tab reporting, instant reporting function, and others to improve decision making and efficiency within an organization.

Figure: Enterprise Architecture Planning to Realize Strategic Vision and Business Objectives



Competitive Landscape and Analysis

Quadrant Knowledge Solutions conducted an in-depth analysis of the major Enterprise Architecture (EA) Tools platform vendors by evaluating their products, market presence, and customer value proposition. The evaluation is based on primary research with expert interviews, analysis of use cases, and Quadrant's internal analysis of the overall Enterprise Architecture market. This study includes analysis of key vendors, including Ardoq, Avolution, Bee360, BiZZdesign, BOC Group, Capsifi, Enterprise Architecture Solutions, erwin by Quest, LeanIX, MEGA International, Orbus Software, Planview, Qualiware, Software AG, Unicom Systems, and ValueBlue.

Mega International, Software AG, Lean IX, Planview, erwin by Quest, BiZZdesign, Qualiware, Bee360, ValueBlue, and Enterprise Architecture Solutions have been positioned as the technology and market leaders in the Enterprise Architecture Tools SPARK Matrix, 2022. The vendors in this group have been categorized on the basis of their ability to offer the full spectrum of Enterprise Architecture management suite with complete enterprise architecture domain coverage, including strategy, business architecture, business process analysis, information architecture, application architecture, service architecture, infrastructure architecture, risk management, and others. Further, the vendors also provide business process management support, metamodels to support API development, integrated governance, risk, and compliance, IT architecture, including cloud services, IoT, and security. The leaders, with their offerings, are incorporating advanced intelligence features such as model recognition or pattern detection into their platforms for greater insights that can be applied to newly discovered data or any proposed business or IT architecture. Vendors are also significantly improving the user interface and user experience by streamlining navigation, adding new modeling features, application performance monitoring automation, more sets of templates for cloud architecture, and others to provide a seamless and easy-to-use experience to users.

Mega International is positioned as a market and technology leader that facilitates holistic EA coverage with its HOPEX platform, which provides a single repository to cover a broader scope of enterprise architecture, enabling organizations to reuse the data for better decision-making. Mega International, with its EA tools offerings, helps organizations to create a strategic business transformation

roadmap by capturing strategic objectives using value streams to communicate how organizations expect to deliver value and adopt a user-centric perspective by mapping their customer journey, mapping organizations' current and future business capabilities, and creating a transformation roadmap by making the best use of technology resources. Furthermore, Mega's newly added application performance management automation capability in the HOPEX platform allows customers to rapidly identify their technologies and align them to the business model for value-oriented rationalization. Furthermore, to accelerate decision-making for IT transformation, HOPEX also provides automated analysis of IT portfolios, which recommends actions to be taken for the application based on the assessment of multiple criteria, such as business value, functional support, and technical efficiency.

Software AG is positioned as a market and technology leader that provides an enterprise architecture platform, Alfabet, which synchronizes IT planners, strategists, architects, and portfolio managers, as well as business strategy and planning stakeholders, through a common language and knowledge base for everyone involved in business and IT change. It enables users to prioritize business strategies that are to be executed and synthesize the broad range of performance and data to improve the stakeholders' decision-making process. Alfabet's patented master planning functionality further helps organizations to explore tactical options and maintain flexibility in the IT architecture. The company, with its EA tools offerings, also ensures the optimization of the technology portfolio and its use for improved business results to facilitate new technology implementations. Furthermore, Software AG's integration of agile capabilities and its significant global footprint across various industries make it stand out in the market against its competitors.

LeanIX is positioned as a market and technology leader that provides an enterprise architecture platform that enables corporate IT and product IT teams to plan and manage their continuous transformation journeys and incorporate microservice Intelligence. Further, the micro intelligence part of LeanIX's continuous transformation platform automatically creates a microservices catalog that integrates with the DevOps toolchain to provide a holistic view of the application's ownership and dependencies. LeanIX, with its modern EA tool offerings, understands digital business requirements and has the capacity to predict, plan, decide, and execute transformation initiatives, which results in visibility into the current scenario complemented by the ability to build a roadmap for the desired future-state IT architecture. Moreover, LeanIX's SaaS discovery

model with enterprise architecture automatically identifies SaaS usage in an enterprise across the organization and simplifies SaaS management, optimizes security, and license usage and spending, which makes LeanIX stand out in the market against its competitors.

Planview is positioned as a market and technology leader that offers features for the strategy, planning, delivery, and data analysis phases of entire ecosystems. In strategic planning, the company translates strategy into delivery by connecting investments, technology capability, and business roadmap to achieve strategic goals. In the planning phase, it helps companies to adapt to changes, visualize interrelationships, and create scenario modeling. Further, it ensures that the strategy, EA, and program teams collaborate together and deliver the desired outcome.

Erwin by Quest is positioned as a market and technology leader that offers the enterprise architecture platform Evolve, which provides advanced visualization, documentation, analytics, and integration capabilities to teams to implement both enterprise architecture and business process modeling within one software suite. Furthermore, erwin Evolve uses a business process model and notation diagram capabilities to provide visibility and easy-to-understand intelligence to easily create and visualize complex models. It also leverages an array of analytic capabilities to explore model elements, interdependencies, and interrelationships and understand the impact of change. erwin Evolve provides a central source of information about the enterprise and how it operates by using a shared, central repository with integrated views of strategy, capabilities, applications, data assets, and others. Further, erwin Evolve's democratization of enterprise architecture by providing a persona-driven user interface and its providing model content across teams through enhanced website management makes it stand out in the market against its competitors.

BiZZdesign is positioned as a market and technology leader that facilitates its HoriZZon platform for enterprise architecture that brings together strategy, IT architecture, operating models, data, capabilities, change portfolios, and ideas into a single, intuitive, collaborative business design platform. BiZZdesign also offers robust governance and security features which include single sign-on, audit trail, policies, access control, and workflows. Further, it also actively simulates and support innovation capabilities across multiple dimensions inside and outside clients' organization and help them to develop new efficiencies and processes.

Qualiware is positioned as a market and technology leader that provides full enterprise architecture coverage that enables users to model the architecture of an organization at a very granular level to create a true representation of reality regardless of the point of view (either through a business lens, data lens, or technology lens). The company also extends out-of-the-box support for business process management and related notations, enabling processes to be structured and defined at a level that best suits the requirements of an organization. QualiWare helps its customers to choose either a pre-configured platform or create a user-friendly front-end interface that is also usable for non-experts. QualiWare, with its robust enterprise offerings, creates a space for intelligent knowledge-sharing, work management, and improved collaboration and communication across corporate boundaries. Moreover, QualiWare's analytics engine can seamlessly integrate with external data sources to enable a single view of performance data support and support for generic interface to connect with third parties, hub-based integration (using a common API hub), as well as point-to-point interfaces to integrate QualiWare with a specific target system, which brings more value to its integration capabilities with performance data.

Bee360 is positioned as a market and technology leader that facilitates a holistic approach to help all the stakeholders understand how the changes in the economic framework data affect the enterprise architecture, which creates a suitable recommendation at every level in the organization. Furthermore, it helps organizations manage their strategies by defining strategic initiatives through roadmaps, related projects, services, and agile teams to help users understand the impact of such initiatives on enterprise architecture. Further, the company's Bee approach, which offers a flexible and adaptive framework for holistic IT management, digital twin of the organization (DTO), built-in capabilities of demand, product, project, and portfolio management (standard interfaces with ITSM systems like ServiceNow and Remedy), IT financial management (standard interfaces with ERP systems like SAP and Navision), strategy execution management, and tight integration with agile and collaborative tools (Jira, Confluence, Teams, and GitLab) makes it stand out in the market against its competitors.

ValueBlue is positioned as a market and technology leader that provides robust Enterprise Architecture management offerings that help organizations accurately define their current state transformation designs, identify the steps needed to reach the aspired future state, and provide the insights and tools to manage the process. It also offers enterprise architecture tools through its platform BlueDophin which helps Enterprise Architects, CIOs, and Solution Architects

plan business transformation and collaborate on executing and managing every process within the organization based on real data insights. BlueDolphin brings together the organization's processes, data, applications, and infrastructure to effectively guide the digital transformation process with more agility. Furthermore, ValueBlue provides dynamic visualization that enables organizations to accurately assess its current state, perform impact analyses, and make data-driven decisions for themselves and their transformation process. Further, BlueDolphin advance functionality to elevate customers' business capabilities, processes, application management, data management, project designs, and enterprise architecture to deliver agile business transformation makes ValueBlue stand out in the market.

Enterprise Architecture Solutions is positioned as a market and technology leader that facilitates Essential, its enterprise architecture platform, which provides business and IT stakeholders with the insights they need to make informed decisions. Enterprise architecture solutions (EAS) company offers greater flexibility to users so that users can extend company's meta-model and can create views quickly. The company is also building an intelligent sensor framework to identify issues and opportunities and notify them to users. Further, the EAS pricing strategy is also a major factor that makes the company stand out in the market against its competitors.

Avolution, BOC Group, Orbus Software, Capsifi, Ardoq, and UNICOM Systems are placed as challengers which specialize in delivering niche services and hold the potential to grow in the global enterprise architecture tools market. Avolution, with its ABACUS platform, offers a wide range of frameworks and multiple deployment options, including an on-premises basis or as a SaaS tool. The product also features an editable catalog, out-of-the-box no-code algorithms, single sign-on, and visualization in a graphical view for forming deeper connections between business systems and technology. BOC Group provides enterprise architecture tools via the ADOIT Enterprise Architecture Suit that provides transformation portfolio management, business capability management, Application portfolio management, Data portfolio management, Technology portfolio management & Architecture Compliance management.

Further, Orbus Software Orbus Software, with its i-server 365 enterprise architecture suite, provides various features and functionalities such as a central repository for enterprise information that helps in establishing a single source of data and information for the enterprise landscapes with assets, process, information, applications, technology, and risk domains. It assists in storing the

assets as intelligent objects with metadata and relationships to help understand dependencies, impacts, and risks and manage and visualize users' transformational initiatives. Further, it also offers collaboration and contribution tools that help in collaborating with business stakeholders in the tool they know and trust, maximizing their contribution of information to enrich and validate user's repository content. Capsifi offers a digital operating model platform named Jalapeno that helps architects design and manage business models for innovation and transformation, from concept to execution. Ardoq provides enterprise architecture tools via the Ardoq tool that connects business, IT, data, and risks perspectives in a single place and integrates across an entire company's ecosystem.

Industries are undergoing a rapid transformation, as post-pandemic, all the organizations have realized the necessity of enterprise architecture tools to align their business process with their IT to create greater value. EA tools vendor allows companies to capture and establish relationships and dependencies between several capabilities, business processes, data, and other technologies. An efficient enterprise architecture tool maintains a repository framework of data integration and metadata regarding the organizational assets. Moreover, enterprise architecture tools offer a modeling capability that helps companies locate and manage these relationships. The business capability also guides companies during the decision-making process. The enterprise architecture tools market is segmented with different architectural models that help navigate the solutions for business processes, which further improve workflow and productivity. The rising demand for digital transformation will increase the awareness of enterprise architecture tools platforms exponentially in the coming times and drive market growth. The vendor's ability to accommodate emerging technology trends, including AI, ML, and a truly open & unified platform, is becoming crucial for delivering sophisticated enterprise architecture tools.

Competitive Differentiators

Most Enterprise Architecture (EA) Tools vendors provide comprehensive functionalities to support various use cases, their technology, and customer value proposition. While that might differ based on their customer size, industry vertical, geographical markets, and organization-specific requirements. The digital environment is continuously transforming, requiring vendors to expand their R&D budgets and continuously enhances their platform's value proposition to ensure future market needs.

Users should partner with enterprise architecture tools vendors which provide a robust technology strategy and roadmap for improving their platform features & functionalities, product strategy, and alignment with emerging transformational trends. The vendor's ability to accommodate emerging technology trends, including advance integration capabilities, maturity of innovation management, ease of implementation, supporting a variety of use cases, centralized data repository, vendors domain knowledge and industry experience, holistic platform for supporting business and IT transformation, configuration and management, collaborative workflows across all business domain, real-time insights into organization's operational performance, and flexible EA model are increasingly becoming key differentiators for selecting enterprise architecture platform.

- **Advance Integration Capabilities:** Enterprise Architecture (EA) tools platforms include purpose-built models offering the creation and management of architectural models that can be seamlessly integrated into enterprise applications and processes for real-time visibility into the organization. EA tools already integrate with other platforms such as business process management, product and portfolio management, process mining, digital twins, and others to provide a unified view of the business and to import and export data from other platforms. The integrations also allow communication between programs to eliminate data quality inefficiencies, redundancies, and data silos. Moving forward, users should look for vendors providing dedicated integration capabilities (such as APIs) and support to allow EA tools to integrate with other enterprise solutions. Users should also evaluate EA tools vendors on their ability to facilitate the integration of multiple IT components in cross-platform utility and other development paradigms of newer kinds of digital operations.

- **Maturity of Innovation Management Offerings:** Innovation management helps organization to effectively pursue company's business objectives through innovative ideas, products, processes, and business models. Innovation management plays a crucial role in the growth of company and helps enterprise to gain competitive edge. Users must look for EA tools vendors that implements promising innovation projects and recognize business strategies that can impact future business need. EA tools vendors extend their support for innovation management capabilities at different levels and offer opportunities and implication of innovative technologies such as embedding artificial intelligence, new business models, new services or products and enhanced customer experience. Users should evaluate advanced innovation management capabilities for EA tools vendors as per their business requirement.

- **Ease of Implementation:** Users face a number of challenges while implementing EA tools, including unclear architect roles, communication and collaboration problems, inappropriate EA governance, the complexity of the EA framework, and others. Users should evaluate vendors that provide seamless implementation of EA platform and builds legitimacy and organizational support over time by cultivating increasing benefits and usefulness of EA practices. The EA tools vendors should support large enterprises' needs by providing a scalable technical architecture that allows load-balanced deployment across multiple organizational processes.

- **Supporting a Variety of Use Cases:** With the growing adoption of digitization, users should evaluate EA tool vendors on their ability to support a wide range of use cases for enabling growth, ensuring risk and compliance, and reducing complexity. EA tools vendors should differentiate themselves by supporting a plethora of use cases, including cloud transformation, technology risk management, integration architecture, data compliance, IoT architecture, standard governance, and others. Users should evaluate EA tools vendors that support their organization-specific and industry-specific use cases to ensure an enhanced holistic view of organizations strategy, process, information, and IT assets that supports efficient and secured operations across all business units.

- **Centralized Data Repository:** A centralized data repository allows organizations to store all the data in a single place and offer intelligent insights into gaps and opportunities while executing appropriate EA strategies. EA tools vendors use different strategies for data visualization as well as features to support different types of IT business requirements. Users should look for EA tool vendors offering advanced data repository capabilities that support functions including data enrichment, data import and export from multiple stores, flexible and logical structure for data storage, a wide range of data entity classes, as well as multiple language support, as per their current and evolving business requirements.

- **Vendors' Domain Knowledge and Industry Experience:** As the enterprise architecture tools market is evolving, users should evaluate vendors based on their specific domain knowledge to provide innovative, agile practices and the ability to cater to a wide range of use cases. Users are also advised to consider the vendor's ability to incorporate advanced capabilities into their platforms, including social analytics, advanced analytics, collaboration across the enterprise, enterprise investment, web modeling, data intelligence integration, application performance monitoring, and others as per their specific business requirements. Users should carefully examine vendors by their offering of the entire enterprise architecture suite, including information, business, applications, and technology architecture, to better shape their IT landscape with organizational goals.

- **Holistic Platform for Supporting Business and IT Transformation:** EA tools vendors are moving towards using a holistic approach for planning next-generations services to cater to new digital learning environments and next-generation IT platforms that provide a complete blueprint for how IT can contribute to an organization's strategic goals. Users should look for vendors that provide complete visibility, governance, and customizable features into a single platform. Users should evaluate vendors on the maturity of key capabilities and functions, including analytics, interoperability, personalization, collaboration, accessibility for modern architectures, better data integration, and improved user experience.

- **Configuration and Management:** Configuration and management play a crucial role in setting up and administering the EA tooling

platform, along with ensuring that the product's performance and physical and functional properties are consistent with business requirements. Configuration and management also help users in configuring the EA tooling platform for different classes of users using the platform and aligning features and rights as per their requirements. Users should look for vendors providing robust configuration and management capabilities to improve operational efficiency and maintain accuracy for keeping the assets in the desired state.

- **Collaborative Workflows across all Business Domain:** EA tools vendors are offering end-to-end collaborative workflows to increase risk and security governance by risk intelligence, risk assessment, threat identification, application security, business resiliency, and classification of information. EA tools platform continuously collects information, validates its accuracy, and retains a record of all the interventions to ensure compliance with regulatory requirements, architecture principles, and other constraints. Users should look for EA tool vendors offering an integrated workflow system to execute workflow models and track the status of model-activities. Further, having a collaborative workflow gives users room for feedback, discussions, and collaborative maintenance around all the assets in the repository.

- **Real-time insights into Organization's Operational Performance:** EA tools vendors are continuously strengthening their business information management offering to give real-time insights to users to achieve business goals. Various vendors offer real-time insights with appropriate integration with operational systems and embedded machine learning algorithms that collect information from the architectural landscape and give better, data-driven insights for better decision-making. Users should look for vendors whose products can connect to real-time data, enabling them to monitor activities and user behavior in relation to the IT architecture that they manage in the EA platform.

- **Understanding the Impact of Automation under different Operating models :** Advanced technologies such as machine learning, artificial intelligence, natural language processing, blockchain, and interactive interface are transforming businesses and operating models. These new technologies are introducing new

ways for enterprise architecture tools to operate in the IT landscape. To achieve the full potential of the transformation, users must understand the effects of automation within the operating model and look for EA tools vendors that support their organizational designs and whose products can be deployed under various operating models as per business requirements. Users should also look for advanced automation capabilities of EA tools vendors to support the organizational design and automation impact analysis.

- **Flexible EA Model:** Users should look for vendors providing flexible EA models that are adaptable to any workspace. A flexible EA model helps users validate the technical and functional benefits of current and future data objects while ensuring databases are correctly represented. Vendors should provide flexible EA models to help users easily adapt to changing environments as well as disruptions and simplify decision-making in complex situations.

- **Usability:** EA platform vendors continuously undergo periodic, consistent, and multiple changes and add new features and functions to achieve end-to-end streamlined enterprise architecture. These changes are continuous and vary in complexity as per the user requirements. Users should look for EA tools that are easy to use and support a wide range of user classes, including analysts, technology architects, business users, strategy analysts and others, with a streamlined user experience to learn and discover new content.

- **Mitigation of technological Risk by Reducing outdated (Compromised) Technologies:** EA tools help users understand the dependencies between application and technology infrastructure in a business context, which helps enterprise architects to evaluate real-time impact of change and choose the best options for meeting their business objectives. The platform also provides a detailed view of technologies and their alignments with corresponding business processes and the capability to decide whether to add new technologies, update the existing one, or eliminate the existing technology. This added information will help users mitigate technological risk by taking the right decision at the right time. Users should look for vendors providing automated feeds for various technology attributes and evaluate against the chosen criteria to make better business decisions.

SPARK Matrix™: Strategic Performance Assessment and Ranking

Quadrant Knowledge Solutions' SPARK Matrix provides a snapshot of the market positioning of the key market participants. SPARK Matrix provides a visual representation of market participants and provides strategic insights on how each supplier ranks related to their competitors, concerning various performance parameters based on the category of technology excellence and customer impact. Quadrant's Competitive Landscape Analysis is a useful planning guide for strategic decision makings, such as finding M&A prospects, partnership, geographical expansion, portfolio expansion, and similar others.

Each market participants are analyzed against several parameters of Technology Excellence and Customer Impact. In each of the parameters (see charts), an index is assigned to each supplier from 1 (lowest) to 10 (highest). These ratings are designated to each market participant based on the research findings. Based on the individual participant ratings, X and Y coordinate values are calculated. These coordinates are finally used to make SPARK Matrix.

Technology Excellence	Weightage
Sophistication of Technology	20%
Competitive Differentiation Strategy	20%
Application Diversity	15%
Scalability	15%
Integration & Interoperability	15%
Vision & Roadmap	15%

Customer Impact	Weightage
Product Strategy & Performance	20%
Market Presence	20%
Proven Record	15%
Ease of Deployment & Use	15%
Customer Service Excellence	15%
Unique Value Proposition	15%

Evaluation Criteria: Technology Excellence

- **The sophistication of Technology:** The ability to provide comprehensive functional capabilities and product features, technology innovations, product/platform architecture, and such others.

- **Competitive Differentiation Strategy:** The ability to differentiate from competitors through functional capabilities and/or innovations and/or GTM strategy, customer value proposition, and such others.

- **Application Diversity:** The ability to demonstrate product deployment for a range of industry verticals and/or multiple use cases.

- **Scalability:** The ability to demonstrate that the solution supports enterprise-grade scalability along with customer case examples.

- **Integration & Interoperability:** The ability to offer product and technology platform that supports integration with multiple best-of-breed technologies, provides prebuilt out-of-the-box integrations, and open API support and services.

- **Vision & Roadmap:** Evaluation of the vendor's product strategy and roadmap with the analysis of key planned enhancements to offer superior products/technology and improve the customer ownership experience.

Evaluation Criteria: Customer Impact

- **Product Strategy & Performance:** Evaluation of multiple aspects of product strategy and performance in terms of product availability, price to performance ratio, excellence in GTM strategy, and other product-specific parameters.

- **Market Presence:** The ability to demonstrate revenue, client base, and market growth along with a presence in various geographical regions and industry verticals.

- **Proven Record:** Evaluation of the existing client base from SMB, mid-market and large enterprise segment, growth rate, and analysis of the customer case studies.

- **Ease of Deployment & Use:** The ability to provide superior deployment experience to clients supporting flexible deployment or demonstrate superior purchase, implementation and usage experience. Additionally, vendors' products are analyzed to offer user-friendly UI and ownership experience.

- **Customer Service Excellence:** The ability to demonstrate vendors capability to provide a range of professional services from consulting,

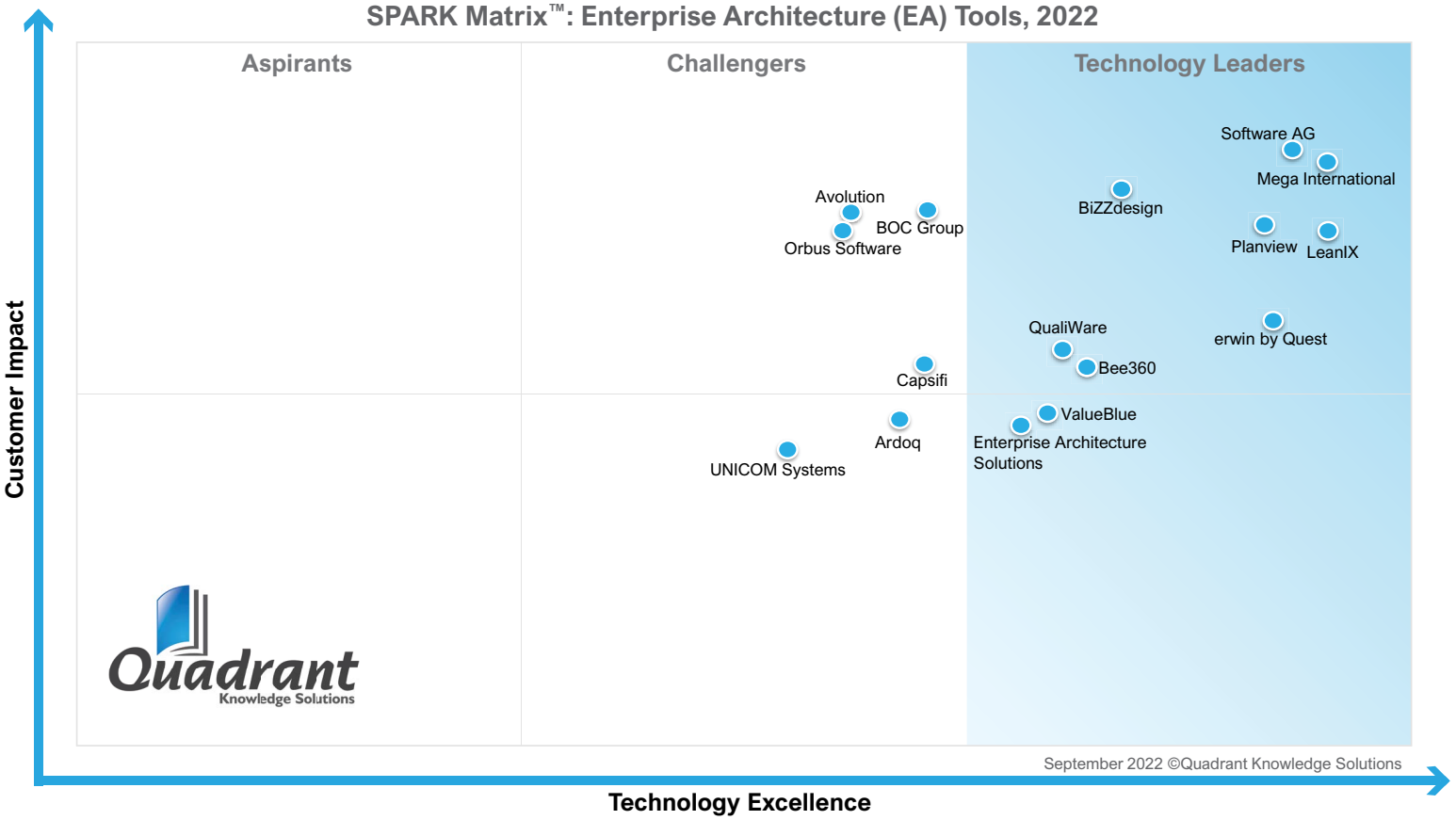
training, and support. Additionally, the company's service partner strategy or system integration capability across geographical regions is also considered.

- **Unique Value Proposition:** The ability to demonstrate unique differentiators driven by ongoing industry trends, industry convergence, technology innovation, and such others.

SPARK Matrix™: Enterprise Architecture (EA) Tools

Strategic Performance Assessment and Ranking

Figure: 2022 SPARK Matrix™
(Strategic Performance Assessment and Ranking)
Enterprise Architecture (EA) Tools Market



Vendor Profiles

Following are the profiles of the leading Enterprise Architecture (EA) Tools vendors with a global impact. The following vendor profiles are written based on the information provided by the vendor's executives as part of the research process. The Quadrant research team has also referred to the company's website, whitepapers, blogs, and other sources for writing the profile. A detailed vendor profile and analysis of all the vendors, along with various competitive scenarios, are available as a custom research deliverable to our clients. Users are advised to directly speak to respective vendors for a more comprehensive understanding of their technology capabilities. Users are advised to consult Quadrant Knowledge Solutions before making any purchase decisions regarding Enterprise Architecture (EA) Tools technology and vendor selection based on research findings included in this research service.

QualiWare

URL : www.qualiware.com

Founded in 1991 and headquartered in Denmark, QualiWare is a global business modeling software and consultancy provider. QualiWare offers an enterprise architecture and business management tool known as QualiWare X for organizations to evolve and transform through smart management and collaboration. The key features and functionalities of its enterprise architecture solution include full enterprise architecture coverage, full BPM support, capability management, enterprise investment, strategy to execution, collaboration across the entire enterprise, advanced analytics, social analytics, AI - picture to model & text to model, 3D Visualizer, integration of external performance data, and metamodel to support API development.

The company offers full enterprise architecture coverage that enables users to model the architecture of an organization at a very granular level to create a true representation of reality regardless of the point of view (either through a business lens, data lens, or technology lens). The company also extends out-of-the-box support for business process management and related notations, enabling processes to be structured and defined at a level that best suits the requirements of an organization. Furthermore, organizations can very quickly establish a graphical representation of their architecture that is supported by operational monitoring, reporting, and metrics with QualiWare's governance, dashboarding, and monitoring features and its ability to calculate critical paths and compare different process revisions against each other.

The company's enterprise investment capability transforms goals into outcomes through its standard change portfolio, which considers the investment process, EA, investment strategy, and management of portfolio performance. The strategy to execution feature is achieved through out-of-the-box frameworks, templates, and models that provide logical guidance depending on the requirement and maturity of an organization. QualiWare, with the full lifecycle management of an organization (which is also configurable depending on the nature of the organization) and portfolio management capability model complex architectures and ensure full coverage of change and impact.

The company's advanced analytics and reporting services offer a holistic view for visualizing dependencies within the organization's architecture. QualiWare X offers a unified and consistent overview of organizational data and insights through

integration capabilities. Furthermore, it enables users to keep track of usage statistics through powerful visualizations, leading to proactive management by simplifying the analysis of complex data. Additionally, the social analytics capability enables the management to analyze and report on usage and engagement metrics of the enterprise architecture repository and operational environment. The AI - picture to model & text to model enables users to translate pictures into graphical models or translate text to graphical models.

The company's 3D visualizer enables a practical 3D graphical representation of a model to be visualized, analyzed, and enhanced through a three-dimensional representation instead of viewing individual models based on their respective templates. The company's analytics engine can seamlessly integrate with external data sources to enable a single view of performance data. It also effectively leverages the performance data of enterprise architecture repositories to quickly predict a potential failure or service impact based on trend analysis. The company supports the modelling of APIs based on RESTful web services (OpenAPI) to integrate with third-party systems to both read and write. QualiWare also provides a generic table interface for basic connections and import/export of CSV/Excel or table-based data. OLEDB and ODBC connectors allow QualiWare X to interrogate and integrate data from external databases.

Analyst Perspective

Following is the analysis of QualiWare's capabilities in the enterprise architecture tools market:

- QualiWare offers global business modeling software that helps organizations with their enterprise architecture, quality management, business process management, and optimization initiatives. QualiWare helps its customers to choose either a pre-configured platform or configure a user-friendly front-end interface that is also usable for non-experts. QualiWare, with its robust enterprise offerings, creates a space for intelligent knowledge-sharing, work management, and improved collaboration and communication across corporate boundaries. Furthermore, the company helps organizations improve customer experience with customer journey maps and documentation for continuous customer engagement management.

- QualiWare's enterprise architecture platform provides its users the flexibility of completely being hosted on cloud, on-premise or private

cloud, or multi-tenant cloud and provides full support for deployment in federated organizations as per their business requirements. Furthermore, QualiWare offers a combination of license structures that can fit customer requirements as per their needs. The combinations include Architect license which unlocks everything in QualiWare intended for Architects, who model across the viewpoints: strategy, process, information, application, organization, and technology. Furthermore, the Plus license type is intended for process responsible employees, application owners & compliance users that can take part in the governance of the architecture process and model work & edit metadata, without any specialized technical skills. The collaboration license is a business-user focused license intended for everyone in the organization. Its dynamic web portal with an individualized front page enables everyone to gain ownership of their work and collaborate across the organization.

- The key differentiators of QualiWare's enterprise architecture platform include its support for full strategic transformation planning and implementation, from strategy building to execution. QualiWare is not limited to one perspective of the organization; it provides the entire length and breadth of a business. The information assets generated through this level of organizational representation can be leveraged to develop change portfolios, transformation plans, implementation plans, and post-implementation support and monitoring. Additionally, the company's relational capabilities to transform a single object or model into a valuable information asset can demonstrate its relevance, value, and contribution to the delivery of business services. Furthermore, collaboration as a core feature, which includes governance workflows & social behavior analytics, enables teams to work together to develop a higher quality output. Furthermore, QualiWare's support for a wide range of frameworks and out-of-box notation and its CaseMaker feature allow users to create entirely new frameworks or hybridize existing frameworks, which makes QualiWare stand out in the market against its competitors.

- QualiWare also offers industry-specific solutions for the healthcare industry, where its healthcare module provides a tailored solution by combining asset management, HR, and competence management.

This creates a platform for a single point of entry, data consistency, and adherence to compliance requirements. It is a valuable tool for connecting the entire lifecycle in the laboratory and healthcare environment to monitor assets for compliance and support the staff to operate assets. This solution has pre-defined workflows and processes to accelerate the implementation of the solution.

- Quadrant analysts believe that QualiWare's analytics engine, which can seamlessly integrate with external data sources to enable a single view of performance data support and support for generic interface to connect with third parties, hub-based integration (using a common API hub), as well as point-to-point interfaces to integrate QualiWare with a specific target system, brings more value to its integration capabilities with performance data.

- In terms of geographical presence, QualiWare has a significant presence in the European Union, the Middle East & Africa, the USA, and Latin America, followed by the Asia Pacific region. The company caters to various industry verticals, including the government and public sector, energy & utilities, financial services (banking & insurance), manufacturing, healthcare & life sciences, logistics & transportation, retail, education, food & beverages, and electronics & semiconductor.

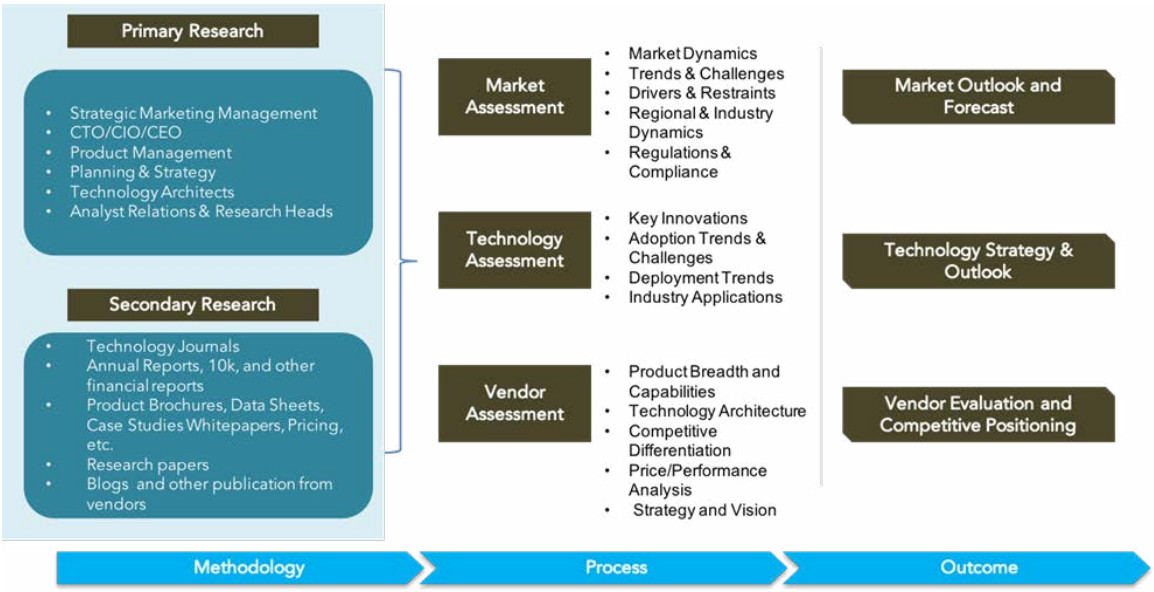
- Some of the top use cases of QualiWare include an operating model approach by modeling the architecture and merging it with operating data to provide a true representation, digitization by capturing information from various sources and integrating, migrating /or centralizing it into QualiWare to provide a single source for reporting and management activities, communication and collaboration by enabling smooth collaboration between stakeholders to ensure that the information assets are maintained and that the content remains relevant to the current state of the organization. Furthermore, QualiWare's governance risk and compliance use case empowers organizations to better manage operating processes & production data by identifying bottlenecks in the process and approval cycles that are outside of acceptable operating levels and can initiate pre-defined governance and compliance processes to drive resolution.

- A key challenge for QualiWare is the growing competition from both emerging and established vendors in this heavily crowded space. Additionally, the company is also focusing on RESTful Webservices and Open API support to maintain interoperability with a growing base of tools and applications. However, with its sophisticated technology platform, comprehensive functional capabilities, and strong customer value proposition, the company is well-positioned to expand its presence in the global enterprise architecture tools market.

- In terms of the future roadmap, QualiWare will continue investing in and supporting the development and growth of Enterprise Architecture through its academic and partner programs. Furthermore, its technology roadmap includes reverse and forward engineering for automation and performance measurements of digitalized businesses in order to create a continuous feedback loop for improvement. The company focuses on increased support and methodology for collaboration – co-creation and knowledge sharing using different types of client environments (browser, tablet, phone, watch, etc.) and strengthening its analysis and 3D visualization capabilities that will document users' journey through content and analysis to provide a roadmap for decision making. It also focuses on expanding application chaining to support the federation of virtualized content across multiple systems in the ecosystem; for example, making SAP processes in the SAP Solution Manager available through QualiWare X to enable a coherent architecture across discrete systems.

Research Methodologies

Quadrant Knowledge Solutions uses a comprehensive approach to conduct global market outlook research for various technologies. Quadrant's research approach provides our analysts with the most effective framework to identify market and technology trends and helps in formulating meaningful growth strategies for our clients. All the sections of our research report are prepared with a considerable amount of time and thought process before moving on to the next step. Following is the brief description of the major sections of our research methodologies.



Secondary Research

Following are the major sources of information for conducting secondary research:

Quadrant's Internal Database

Quadrant Knowledge Solutions maintains a proprietary database in several technology marketplaces. This database provides our analyst with an adequate foundation to kick-start the research project. This database includes information from the following sources:

- Annual reports and other financial reports
- Industry participant lists
- Published secondary data on companies and their products

- Database of market sizes and forecast data for different market segments
- Major market and technology trends

Literature Research

Quadrant Knowledge Solutions leverages on several magazine subscriptions and other publications that cover a wide range of subjects related to technology research. We also use the extensive library of directories and Journals on various technology domains. Our analysts use blog posts, whitepapers, case studies, and other literature published by major technology vendors, online experts, and industry news publications.

Inputs from Industry Participants

Quadrant analysts collect relevant documents such as whitepaper, brochures, case studies, price lists, datasheet, and other reports from all major industry participants.

Primary Research

Quadrant analysts use a two-step process for conducting primary research that helps us in capturing meaningful and most accurate market information. Below is the two-step process of our primary research:

Market Estimation: Based on the top-down and bottom-up approach, our analyst analyses all industry participants to estimate their business in the technology market for various market segments. We also seek information and verification of client business performance as part of our primary research interviews or through a detailed market questionnaire. The Quadrant research team conducts a detailed analysis of the comments and inputs provided by the industry participants.

Client Interview: Quadrant analyst team conducts a detailed telephonic interview of all major industry participants to get their perspectives of the current and future market dynamics. Our analyst also gets their first-hand experience with the vendor's product demo to understand their technology capabilities, user experience, product features, and other aspects. Based on the requirements, Quadrant analysts interview with more than one person from each of the market participants to verify the accuracy of the information provided. We typically engage

with client personnel in one of the following functions:

- Strategic Marketing Management
- Product Management
- Product Planning
- Planning & Strategy

Feedback from Channel Partners and End Users

Quadrant research team researches with various sales channel partners, including distributors, system integrators, and consultants to understand the detailed perspective of the market. Our analysts also get feedback from end-users from multiple industries and geographical regions to understand key issues, technology trends, and supplier capabilities in the technology market.

Data Analysis: Market Forecast & Competition Analysis

Quadrant's analysts' team gathers all the necessary information from secondary research and primary research to a computer database. These databases are then analyzed, verified, and cross-tabulated in numerous ways to get the right picture of the overall market and its segments. After analyzing all the market data, industry trends, market trends, technology trends, and key issues, we prepare preliminary market forecasts. This preliminary market forecast is tested against several market scenarios, economic scenario, industry trends, and economic dynamics. Finally, the analyst team arrives at the most accurate forecast scenario for the overall market and its segments.

In addition to market forecasts, our team conducts a detailed review of industry participants to prepare competitive landscape and market positioning analysis for the overall market as well as for various market segments.

SPARK Matrix: Strategic Performance Assessment and Ranking

Quadrant Knowledge Solutions' SPARK Matrix provides a snapshot of the market positioning of the key market participants. SPARK Matrix representation provides a visual representation of market participants and provides strategic insights on how each supplier ranks in comparison to their competitors, concerning various performance parameters based on the category of technology excellence and customer impact.

Final Report Preparation

After finalization of market analysis and forecasts, our analyst prepares necessary graphs, charts, and table to get further insights and preparation of the final research report. Our final research report includes information including market forecast; competitive analysis; major market & technology trends; market drivers; vendor profiles, and such others.

Client Support

For information on hard-copy or electronic reprints, please contact Client Support at
rmehar@quadrant-solutions.com | www.quadrant-solutions.com