INDUSTRIAL PRODUCT LIFECYCLE MANAGEMENT (PLM) SOFTWARE

ABIresearch
TRUSTED INTELLIGENCE SINCE 1990

COMPETITIVE RANKING

CONTENTS

INDUSTRIAL PRODUCT LIFECYCLE MANAGEMENT SOFTWARE

This competitive ranking covers vendors offering Product Lifecycle Management (PLM) Software. The assessment process examines, among other things, to what extent the vendor's solution(s) can contribute to a manufacturer's efforts to create a digital thread and provide manufacturers with the ability to understand the impact that changes have on expenses, the supply chain, and/or the Bill of Materials (BOM).

ABI Research developed this competitor ranking to offer an unbiased assessment and ranking of PLM vendors.

OVERALL COMPETITIVE RANKINGS

LEADERS

ptc	1	80.3
SIEMENS	2	80.0
aras	3	75.5

MAINSTREAM

DASSAULT SYSTEMES	4	72.0
infor	5	71.3
AUTODESK	6	67.8
arena	7	66.3
upchain	8	64.0
propel	9	62.3

FOLLOWERS

durolabs	10	50.5

LEADER

ptc
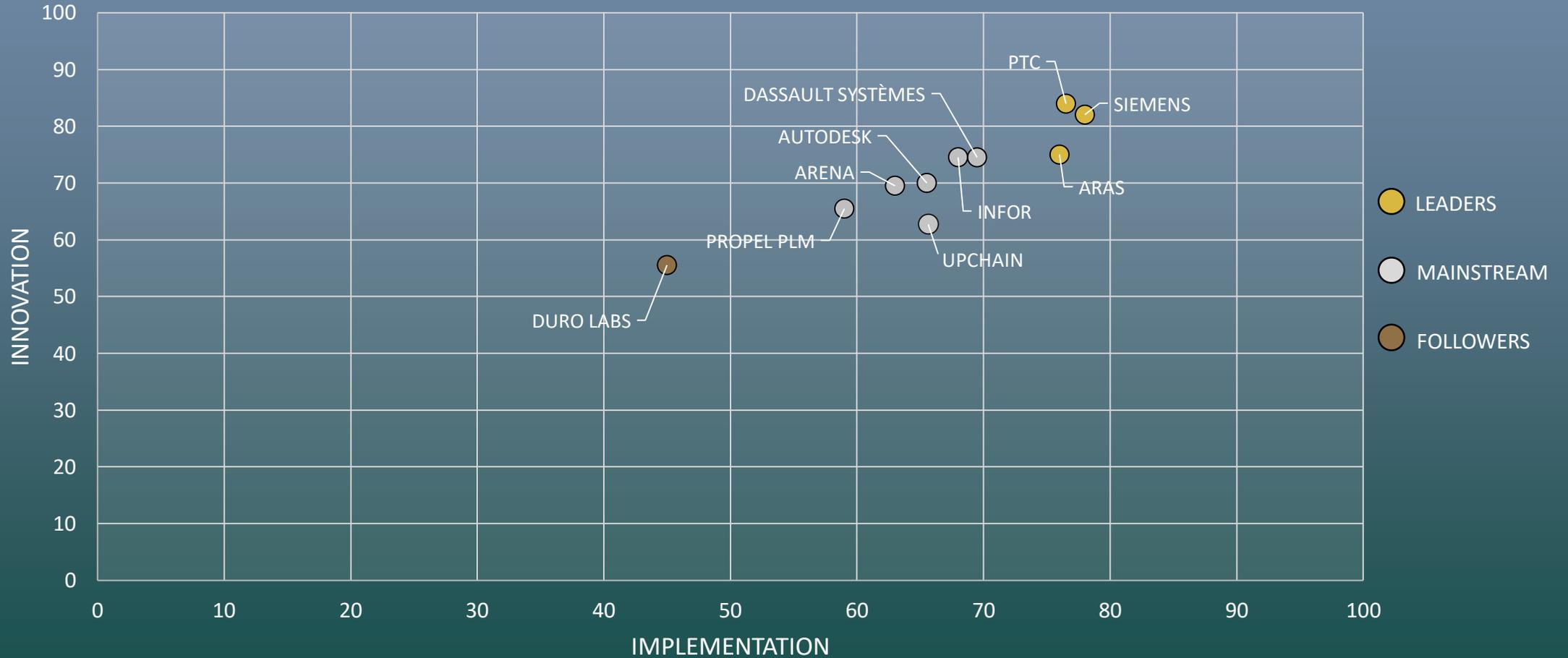
PTC came out on top in the competitor ranking for vendors involved in the PLM Software ranking first for innovation and second for implementation. Siemens came in second for innovation and first for implementation. The scores for Aras, Dassault Systèmes, and Infor were close for both innovation and innovation; further demonstrating how leading industrial software suppliers are looking to help manufacturers bring new products to life.

INNOVATION SUMMARY

PTC leads the rankings for innovation with Windchill able to help manufacturers create and manage their digital threads; keeping all departments up to date on developments. The simulation and analytical capabilities make Windchill stand out, as well as the incorporation of new technologies, such as Augmented Reality (AR). Siemens came in second with the low-code/no-code platform, Mendix, offering a point of differentiation and the investments in the analytical capabilities. In third place was Aras, the company stands out because the platform enables users to customize their instance out of the box, plus the focus on compliance and traceability. Infor and Dassault Systèmes were closely matched with the former having a separate offering for process and discrete manufacturers and the latter able to support manufacturers with the product development process from the Research and Development (R&D) stage to launch. Propel PLM stands out for its focus on helping clients adhere to standards in place across the globe.

IMPLEMENTATION SUMMARY

The partnership with SAP will fuel growth in bookings and revenue for Siemens Teamcenter and edges Siemens ahead of PTC in the implementation rankings. Siemens also scores highly for offering clients pre-configured workflows and offerings that will enable the firm to grow its Small and Medium Business (SMB) business. PTC stands out due to its partner network of top-tier System Integrators (SIs) and availability of learning materials on Windchill. The acquisition of Arena is expected to drive its SMB business. Aras stands out for its geographic footprint and the frequency of updates to the platform, while Dassault Systèmes is ramping up its partner network and will be one to watch. Infor's indirect channel was behind others and should look to create a network on par with its Enterprise Resource Planning (ERP) channels in order to match its vertical expertise.

WHAT IS IN SCOPE?

This competitor ranking concerns vendors with PLM offerings. The assessment process examines to what extent the vendors deliver components of the value chain, the sophistication of the analysis the solution(s) can perform, and vendors' Go-to-Market (GTM) strategies.

The value chain of PLM software consists of several components:

- How comprehensive the solution is for collecting and editing product-related information

- How customers access and use the software

- Whether the solutions help manufacturers in their efforts to adhere to regulations

- The extent that the PLM software helps manufacturers create a digital thread of their operations

For more information, on PLM software, please refer to ABI Research's report Gaining Insights from the Cradle to the Grave with Product Lifecycle Management (PLM) Software (AN 5228) .
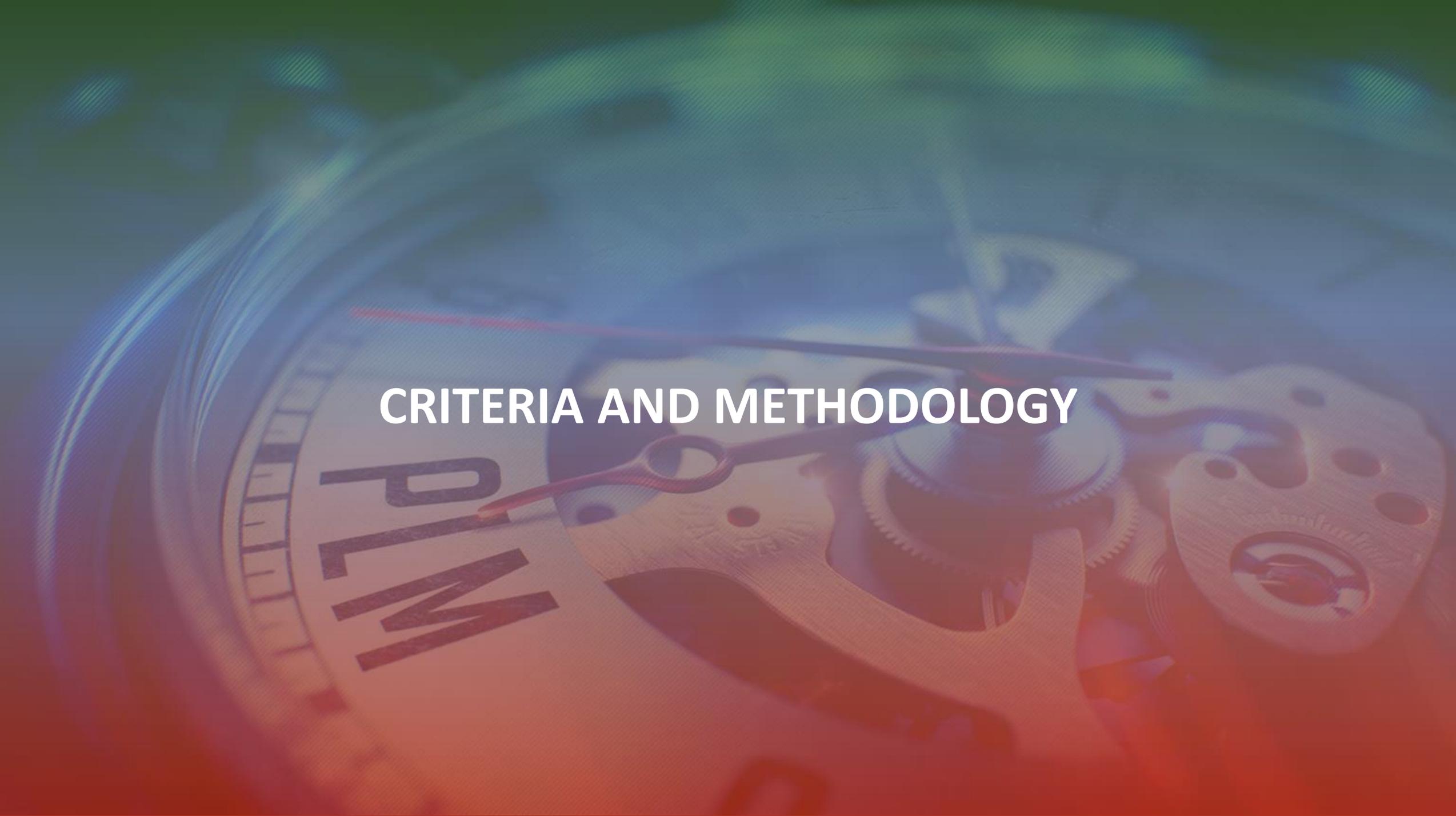
CRITERIA AND METHODOLOGY

VENDOR MATRIX

Methodology: After individual scores are established for innovation and implementation, an overall company score is established using the Root Mean Square (RMS) method:

$$Score = \sqrt{\frac{innovation^2 + implementation^2}{2}}$$

The resulting overall scores are then ranked and used for percentile comparisons.

The RMS method, in comparison with a straight summation or average of individual innovation and implementation values, rewards companies for standout performances.

For example, using this method, a company with an innovation score of nine and an implementation score of one would score considerably higher than a company with a score of five in both areas, despite the mean score being the same. ABI Research believes that this is appropriate as the goal of these matrices is to highlight those companies that stand out from the others.

RANKING CRITERIA

Leader: A company that receives a score of **75 or above** for their overall ranking

Mainstream: A company that receives scores **between 60 and 75** for their overall ranking

Follower: A company that receives a score of **60 or below** for their overall ranking

Innovation Leader: A company that receives a score of **75 or above** for their innovation ranking.

Implementation Leader: A company that receives a score of **75 or above** for their implementation ranking.

INNOVATION CRITERIA

Data Collection: Provides a single version of the truth. Integrates Computer-Aided Design (CAD) files, BOM (Engineering BOM (EBOM), Manufacturing BOM (MBOM), ERP, and updates in real time.

Accessibility: The solution(s) support remote working, is available *via* cloud platform(s), mobile app, and supports real-time collaboration.

Analytics and Simulation Capabilities: Solution includes analytics that helps the user understand what is happening across the production line, plus performs what if analysis, and what does it mean for expenditures, production levels, supply chain, and/or raw material usage.

User Experience (UX): Does the solution offer visualization tools or a low-code/no-code platform? Does the solution meet the expectations of younger recruits?

Support New Technologies: Solution incorporates technologies, such as AR and Three-Dimensional (3D) visualization.

Contributes to Providing the Client with a Comprehensive Digital Thread: Solution provides the capabilities to share product information across the organization (engineering, manufacturing, quality control, distribution, customer service) and other software applications (Manufacturing Execution System (MES), Manufacturing Operation Management (MOM), Quality Management System (QMS), Customer Relationship Management (CRM)).

Enables Compliance and Traceability: PLM solution helps customers incorporate regulations and standards, plus demonstrates adherence in product designs.

IMPLEMENTATION CRITERIA

Revenue and Bookings: Vendor can demonstrate a growing order book and continuous revenue streams.

Industry Expertise: Vendor understands the processes and requirements of verticals.

Nimbleness: Vendor regularly updates the solution.

GTM Strategy: How the vendor generates revenue. Both directly by its own staff, but also *via* partnerships (resellers, technology, or consulting partnerships).

Geographic Spread: Regions where the platform is and is not available. Can a manufacturer roll out the solution globally?

Scale on the Platform: Crawl/walk/run. Can customers start using the solution out of the box and get more out of it with experience? Templates or best practice guides available.

IT Integration: Plugins, Application Programming Interfaces (APIs) available so Information Technology (IT) teams can introduce the solution at scale.

INNOVATION RANKING

PLM SOFTWARE TOP INNOVATORS

PTC lead the rankings for innovation with Windchill able to help manufacturers create and manage their digital threads; keeping all departments up to date on developments. The simulation and analytical capabilities make Windchill stand out as well as the incorporation of new technologies such as Augmented Reality.

Siemens came in second with the low code/no code platform, Mendix, offering a point of differentiation and the investments in the analytical capabilities. In third place was Aras, the company stands out because the platform enables users to customize their instance out of the box plus the focus on compliance and traceability.

Infor and Dassault Systèmes were closely matched with the former having separate offering for process and discrete manufacturers and the latter able to support manufacturers with the products development process from the R&D stage to launch. Propel PLM stands out for its focus on helping clients to adhere to standards in place across the globe.

Rank	Company	Score
1	ptc	84.0
2	SIEMENS	82.0
3	aras	75.0

FULL INNOVATION RANKING

ptc	1	84.0
SIEMENS	2	82.0
aras	3	75.0
infor	4	74.5
DASSAULT SYSTEMES	5	74.5

AUTODESK	6	70.0
arena	7	69.5
propel	8	65.5
upchain	9	62.5
durolabs	10	55.5

IMPLEMENTATION RANKING

TOP IMPLEMENTERS

The partnership with SAP will fuel growth in bookings and revenues for Siemens Teamcenter and edges Siemens ahead of PTC in the implementation rankings. Siemens also scores highly for offering clients pre-configured workflows an offerings that will enable the firm to grow its SMB business.

PTC stands out due to its partner network of top tier system integrators and availability of learning materials on Windchill. The acquisition of Arena is expected to drive their SMB business.

Aras stands out for its geographic footprint and the frequency of updates to the platform while Dassault Systèmes is ramping up its partner network and will be one to watch. Infor's indirect channel was behind others and should look to create a network on a par with its ERP channels in order to match its vertical expertise.

1	SIEMENS	78.0
2	ptc	76.5
3	aras	76.0

FULL IMPLEMENTATION RANKING

TOP IMPLEMENTERS — ABIresearch

SIEMENS	1	78.0
ptc	2	76.5
aras	3	76.0
DASSAULT SYSTEMES	4	69.5
infor	5	68.0

AUTODESK	6	65.5
upchain	7	65.5
arena	8	63.0
propel	9	59.0
durolabs	10	45.0

INDIVIDUAL COMPANY ASSESSMENTS

OVERALL: 80.3 | INNOVATION: 84.0 | IMPLEMENTATION: 76.5 | RANK: 1

PTC INNOVATION *VERSUS* IMPLEMENTATION FOCUS
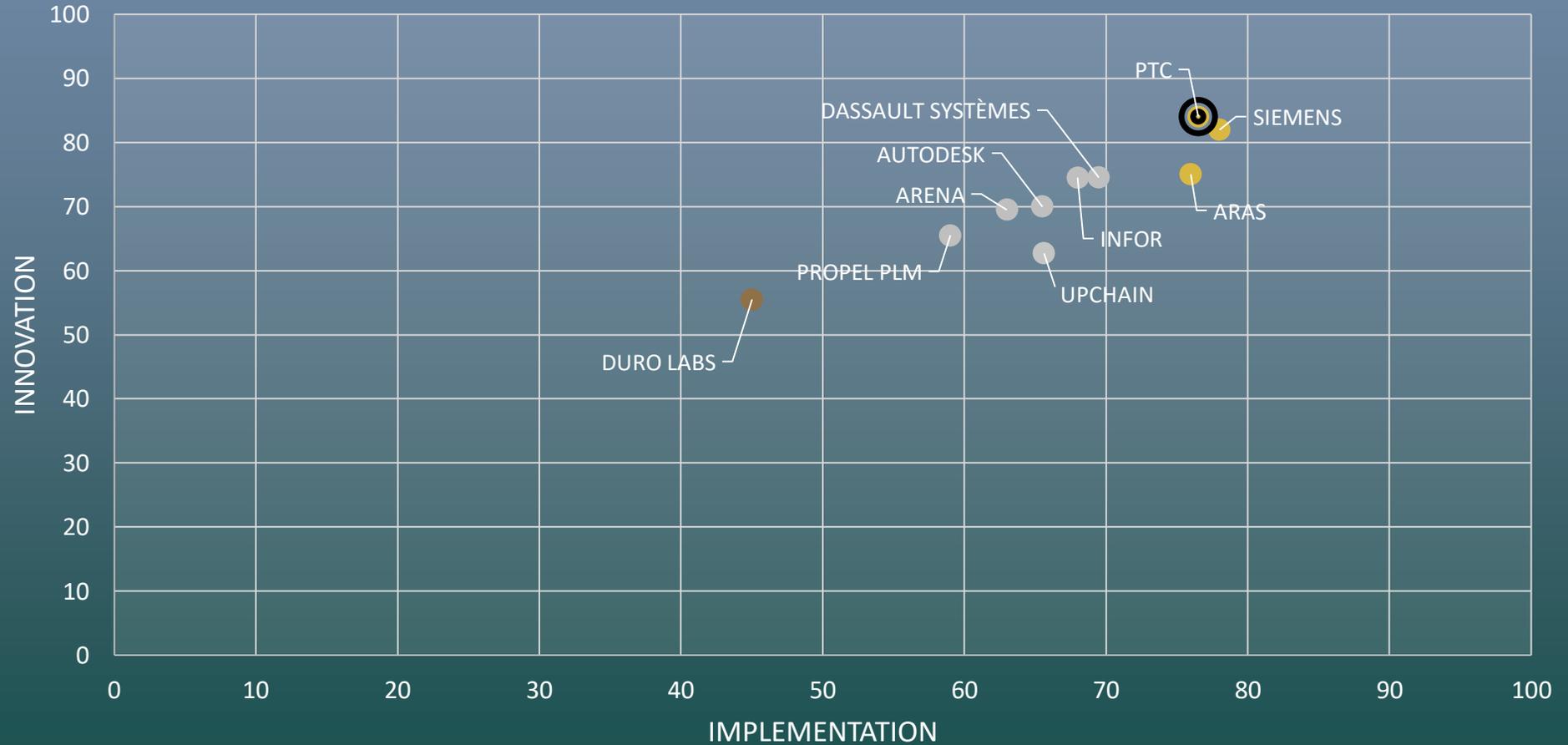
INNOVATION

INNOVATION
SCORE: 84.0

PTC's PLM solution, Windchill, scores 9 for supporting a manufacturer's digital thread and 8 for data collection.

Windchill provides a manufacturer or an industrial firm with a digital thread; connecting engineering, manufacturing, operations teams, quality, sales & marketing, service, and finance teams. The solution encompasses BOM management, manufacturing process management, multi-CAD data management, Product Data Management (PDM), document management, project and design collaboration, governance, test management, change and configuration management, systems and software engineering, variability management, quality management, and service process management.

PLM deployments with PTC can be on-premises, in the cloud, via Windchill Software-as-a-Service (SaaS), on a single server for a workgroup, or a clustered system optimized for content distribution or via Windchill Navigate apps; scoring 9 for accessibility. The acquisition of Arena, which is expected to clear in February 2021, will boost PTC's ability to provide SaaS-based PLM solutions.

Another strength for PTC Windchill is the numerous simulation tools (contributing to PTC scoring 9 for analytics and simulation) covering all the different facets of management for product creation and design for manufacturing, as well as integrating data from other enterprise IT/Operational Technology (OT) sources. Windchill helps users perform generative design and perform Failure Mode Effects Analysis (FMEA).

PTC has the top score of 8 for supporting new technologies among the 10 vendors in this report. Windchill has out-of-the-box applications for both expert and non-expert users designed around specific tasks. In terms of future developments, the solutions includes an AR, Two-Dimensional (2D), and 3D viewer, and Microsoft Azure HoloLens. (AR overlays the data and provides a digital replica preview of large and complex built-to-order products.

Windchill scores 8 for traceability and compliance thanks to its linking of requirements to part structures and downstream data associativity. The streamlined compliance improves compliance, safety, and quality reporting with end-to-end visibility on a secure, tamper-resistant platform. Windchill provides standard Open Services for Lifecycle Collaboration (OSLC) supporting Certification & Qualification (ISO26262, DO-178, among others).

IMPLEMENTATION

IMPLEMENTATION
SCORE: 76.5

PTC scores 8 for revenue and bookings. Windchill has more than 9,000 customers across the globe with industrial equipment, aerospace & defense, automotive, medical device, electronics and high tech key verticals. Raytheon is one of PTC's largest PLM clients with 40,000 users. PTC counts 27 of largest 30 medical devices companies on its PLM roster.

PTC encourages customers to take advantage of templates, best practices, and eLearning materials to get the most out of the platform; scoring 7 for scaling on the platform.

Windchill scores 8 for IT integration, not only because it integrates PTC's Creo, but also SolidWorks, AutoCAD, CATIA, NX, ECAD Partners, and client's corporate applications, such as ERP and MES solutions; it also connects to customers' IT partners.

PTC scores 8 for its GTM strategy, which includes an Advisory Practice offering strategic insights for operational, organizational, and technological transformation.

The PTC Channel Advantage Program supports and certifies a global network of more than 350 partners that resell PTC software licenses and provide services to customers of all sizes.

The PTC Partner Advantage Program provides more than 360 software and hardware partners with the tools and support necessary to integrate applications with PTC solutions.

Finally, the Services Partners Advantage Network is where PTC works with more than 40 partners (including Wipro, Infosys, Atos, Cognizant, Accenture, and Deloitte) to provide consulting and training services to PTC customers.
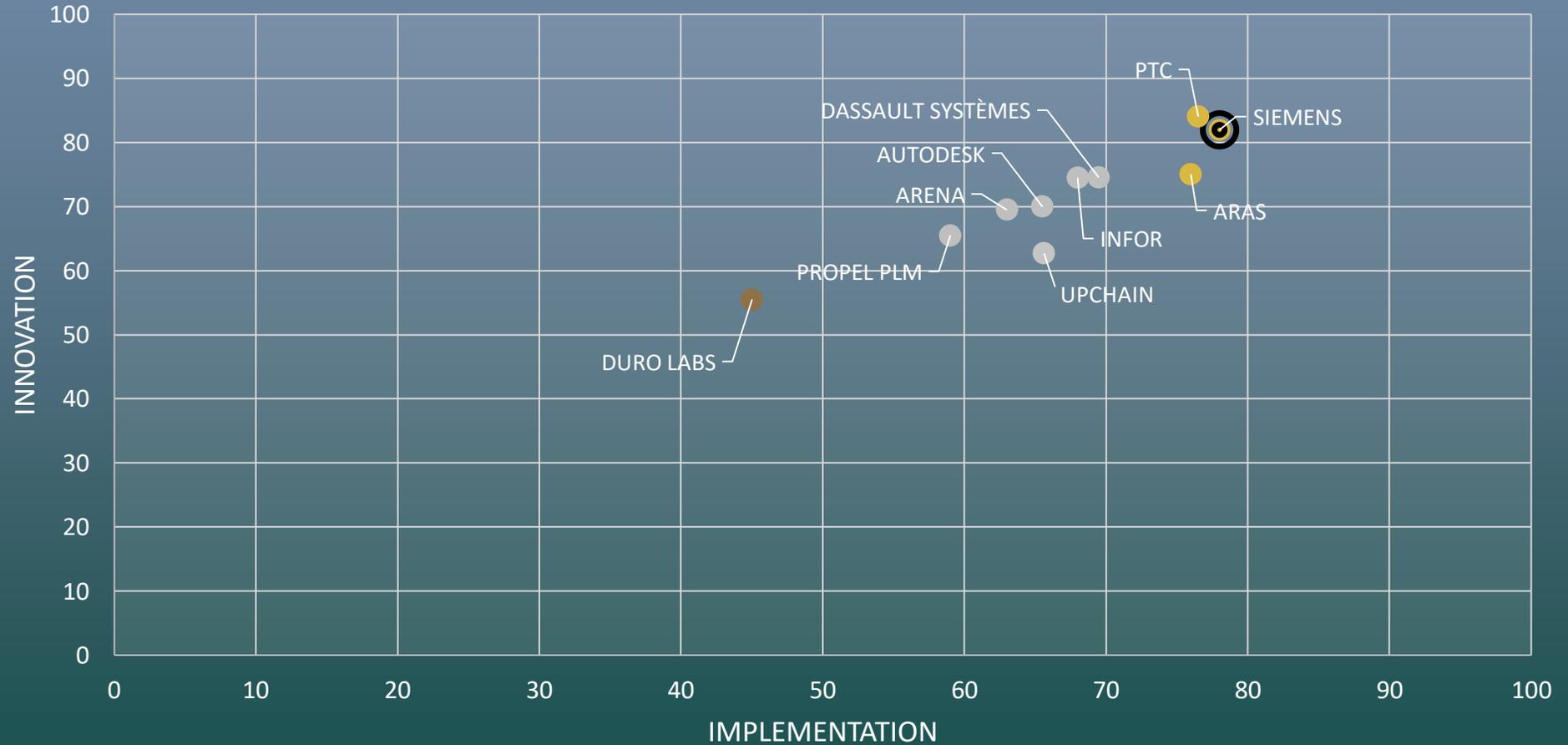
ABI RESEARCH COMPETITIVE RANKING
PLM SOFTWARE

SIEMENS

LEADER
ABIresearch

TOP INNOVATOR
ABIresearch

TOP IMPLEMENTER
ABIresearch

OVERALL: 80.0 | INNOVATION: 82.0 | IMPLEMENTATION: 78.0 | RANK: 2

INNOVATION

SIEMENS

INNOVATION
SCORE: 82.0

TOP INNOVATOR
ABIresearch

Siemens competes in the PLM solution market largely via its Xcelerator portfolio from the Digital Industries Software business unit. Xcelerator includes several different PLM-related applications, including the Teamcenter brand and Teamcenter X, a cloud-based PLM solution. Teamcenter is used by design, engineering, manufacturing, and service operations teams to manage all aspects of the product's life cycle. Teamcenter incorporates BOM management, change management, , and document management capabilities, as well as integrating with the company's NX design, including Convergent Modeling, and the MindSphere Internet of Things (IoT)-as-a-Solution for enabling a comprehensive digital twin. Siemens scores 8 for data collection and 9 for supporting digital threads

Siemens scores 8 for UX thanks to the Mendix application development and data integration platform, which permits any enterprise application, data repository, or thing to become an important source of PLM data. Siemens scores well for supporting new technologies (8) with generative product design, as well as AR/Virtual Reality (VR), and models at various levels of abstraction available. Xcelerator also includes MOM capability, in addition to the ability to simulate the manufacturing process. Siemens has expanded its partnership with eQ Technologic to harness that company's eQube Data-as-a-Service (DaaS) platform across its Xcelerator portfolio. The Mendix data hub leverages eQ DaaS data virtualization to underpin the data consumption and integration needed by new applications, which also contributes to Siemens scoring 8 for analytics and simulation.

Xcelerator gives customers the choice to house their logic and data on-premises, in the cloud, at the edge, or embedded in the system (or hybrid combinations). Teamcenter X incorporates components from the Mendix low-code platform to create new apps or integrate with legacy solutions without in-depth coding knowledge; scoring 8 for accessibility.

The company provides traceability between engineering, Model-Based System Engineering (MBSE), requirements, change management, mechanical design, electrical design, supplier collaboration, BOM, simulation, and compliance, and systems like MES and ERP. With regards to compliance, the PLM solutions are Code of Federal Regulations (CFR) 21 part 11 compliant (for industries like medical devices) and can also incorporate International Traffic in Arms Regulations (ITAR).

The Xcelerator portfolio integrates PLM, ERP, Application Lifecycle Management (ALM), and the IoT, as well as other IT, engineering, and operations systems together. The strategic partnership with SAP adds further capabilities for Siemens to deliver digital thread and digital twin capabilities to customers.

IMPLEMENTATION

SIEMENS

IMPLEMENTATION
SCORE: 78.0

Siemens can support Teamcenter customers from offices in every major economy. The score of 8 for geographic spread stems from Teamcenter being available in both European and Asia-Pacific languages.

The customer installed base covers automotive, aerospace and defense, electronics, consumer products, heavy equipment, and industrial machinery, as well as energy and utility companies; scoring 9 for revenue and bookings.

Siemens scores 8 for scaling on the platform, as Teamcenter comes with pre-configured workflows incorporating industry best practices, enabling clients to accelerate product development by automating and synchronizing processes. Teamcenter X is provided as a SaaS solution with pre-configured templates to help users get started with managing product life cycle data and product configurations, workflow, change, and BOM management.

Siemens scores 8 for nimbleness with Teamcenter Rapid Start, which is focused on the PDM needs of SMBs. Teamcenter X and Rapid Start will enable Siemens to address the needs of SMBs, broadening the Total Addressable Market (TAM) for Siemens. Furthermore, Mendix apps can be quickly created to pull from Teamcenter or other sources; providing an individualized user experience.

Siemens scores 8 for GTM strategy thanks to partnerships with AWS, Microsoft Azure, and Alibaba Cloud hyperscalers, and also the partnership with SAP whereby SAP resells Siemens for PLM, and Siemens resells SAP for product portfolio management and for asset management; again, boosting the company's TAM.

ABI RESEARCH COMPETITIVE RANKING
PLM SOFTWARE

aras

LEADER
ABIresearch

TOP INNOVATOR
ABIresearch
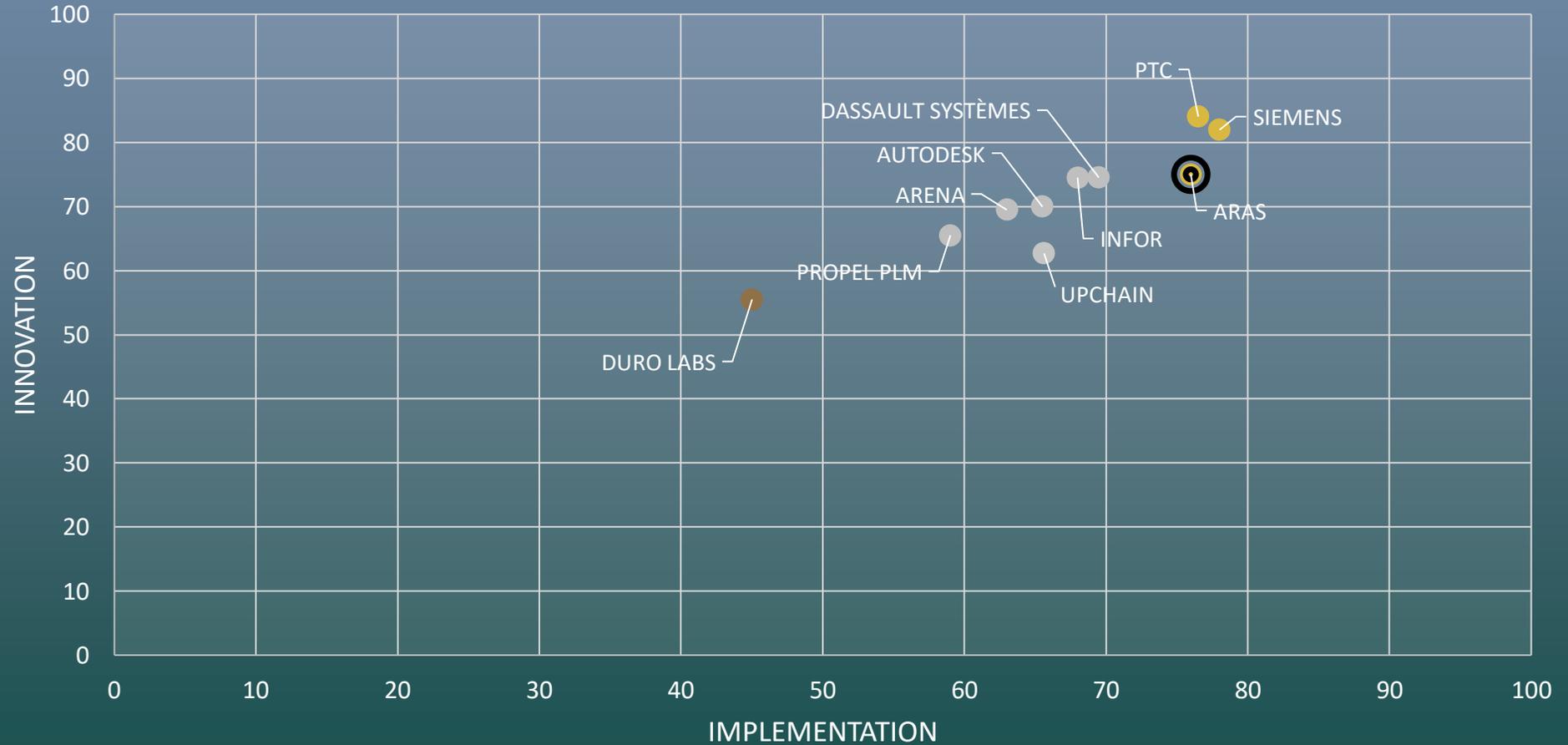
TOP IMPLEMENTER
ABIresearch

OVERALL: 75.5 | INNOVATION: 75.0 | IMPLEMENTATION: 76.0 | RANK: 3

OVERALL: 75.5 | INNOVATION: 75.0 | IMPLEMENTATION: 76.0 | RANK: 3

ARAS INNOVATION *VERSUS* IMPLEMENTATION FOCUS

INNOVATION

INNOVATION
SCORE: 75.0

Founded in 2000, Aras Corporation differentiates its PLM offering, Aras PLM, by offering all the product's features out of the box. Thanks to the low-code design, customers can customize their instance from the outset; contributing to the score of 9 for UX.

The scores of 7 for data collection and 8 for supporting manufacturers' efforts in creating digital threads stem from the Aras PLM platform integrating with third-party CAD or BOM applications. In addition, users choose which connectors and applications they implement on their instance, including Aras Librarian Connector, which automatically synchronizes important PDM data, such as part/CAD data, or assembly structures. The Aras Innovator solution provides workflow management, such as design tracking and BOM/variance configuration. Users can define and manage product data across the product's life cycle with Aras Product Engineering, while Aras Component Engineering can extract data stored in SOLIDWORKS PDM Pro Connector.

Aras scores 8 for simulation and analytics. Aras Simulation Management simulates processes and results, and supports the creation of digital twins; enhanced by partnering with simulation specialist ANSYS. By integrating part numbers, BOM structures, and design elements, customers can perform FMEA.

The Aras Quality Management System provides clients with the tools to adhere to environmental, regulatory, safety, and medical standards, including ISO9001, ISO10007, QSA9000, FDA, CEEE, and GMP, across the product life cycle, giving Aras a score of 7 for compliance and traceability.

Aras Innovator is an open platform that enables companies to incorporate Aras technology in their own solutions via Aras on Microsoft Azure.

The area for improvement would be adding AR capabilities to the solution; Aras scores 6 for supporting new technologies.

IMPLEMENTATION

IMPLEMENTATION
SCORE: 76.0

TOP IMPLEMENTER
ABIresearch

Headquartered in Andover, Massachusetts, Aras has, in the 2 years leading to December 2019, received funding worth US$110 million from investors. The customer base includes more than 350 global multinational customers and more than 250,000 users. Major customers include Airbus, Audi, GE, GM, Honda, Kawasaki, and Microsoft. Aras scores 7 for revenue and bookings.

The company has offices throughout the world and supports customers across 160 countries, giving Aras a score of 9 for geographic spread.

The company's nimbleness stands out with enhancements made to the products on a 4-week cadence, scoring 8, while for many other vendors it is 6 weeks or even quarterly. Customers can easily scale on the platform (scoring 8) by adding components/connectors at their own pace.

In addition to the network of offices, Aras has a mix of partners, including SIs and professional services firms, service partners with vertical expertise, Independent Software Vendor (ISV) solution partners and channel partners providing service support. Also, Aras is an Original Equipment Manufacturer (OEM), licensing with Infor, which uses the Aras platform for its PLM Accelerate product. Aras scores 8 for its GTM strategy.

The only weak area is that while users can tailor the platform to their requirements, they are not offered workflows that mirror the workflows of a vertical market out of the box. Aras scores 5 for industry expertise.

PLM SOFTWARE

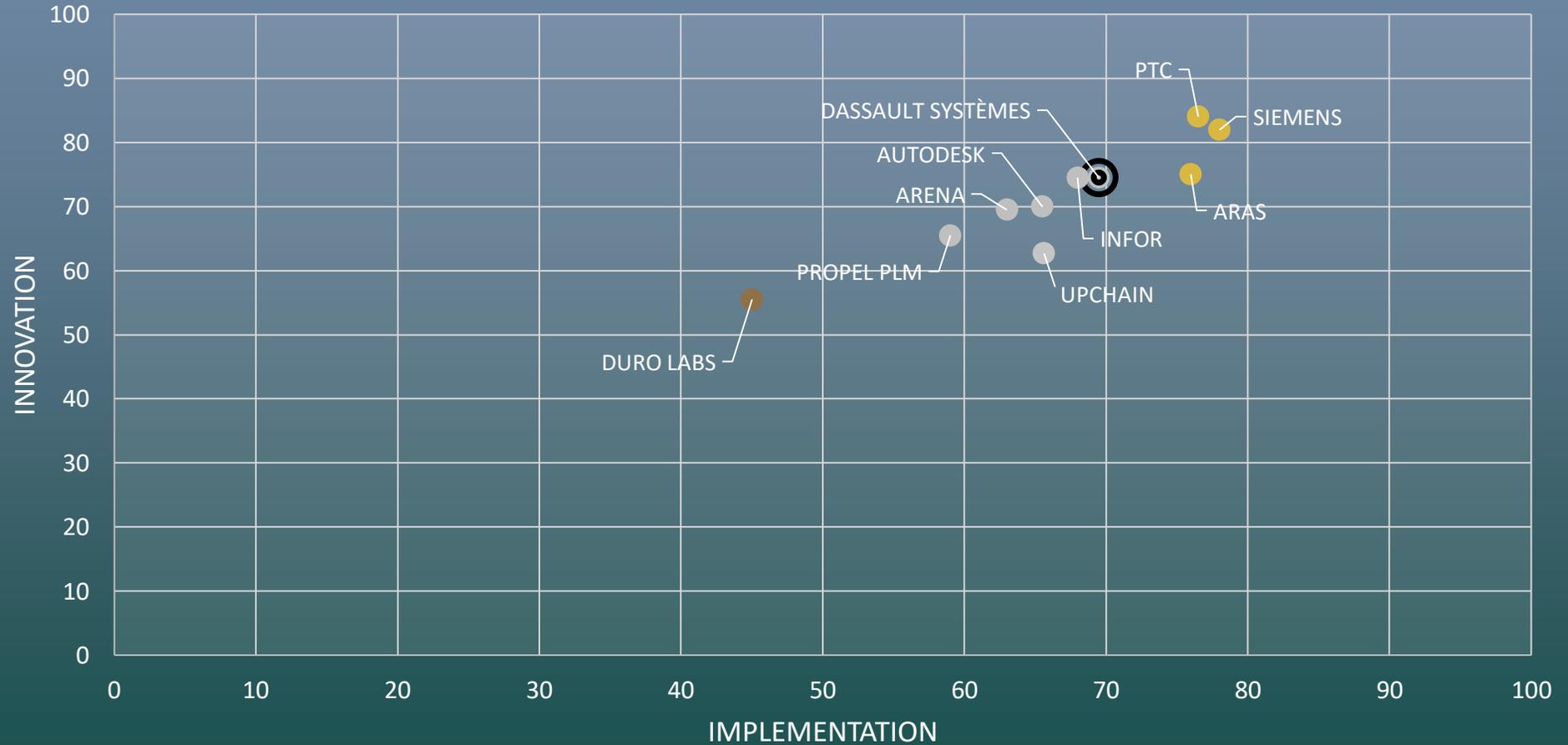OVERALL: 72.0 | INNOVATION: 74.5 | IMPLEMENTATION: 69.5 | RANK: 4

DASSAULT SYSTÈMES INNOVATION *VERSUS* IMPLEMENTATION FOCUS

Scatter plot of INNOVATION (y-axis, 0–100) versus IMPLEMENTATION (x-axis, 0–100) showing: PTC, SIEMENS, DASSAULT SYSTÈMES, AUTODESK, ARENA, INFOR, ARAS, UPCHAIN, PROPEL PLM, DURO LABS.

INNOVATION

DASSAULT SYSTEMES

INNOVATION
SCORE: 74.5

Dassault Systèmes' 3DEXPERIENCE platform supports manufacturers' design and engineering, manufacturing, and production processes with applications for simulation, data governance and life cycle, and 3D design.

Dassault Systèmes scores 9 for supporting digital threads. The 3DEXPERIENCE platform starts in the design process. Engineers can use CATIA to generate virtual visualizations of any part they need to design, collaborate using ENOVIA, and put it through simulations on SIMULIA to ensure it meets all the functional requirements. The platform also includes DELMIA for production simulations and DELMIA Apriso for manufacturing operations management when the design goes to production. Again, all these tools come together on the 3DEXPERIENCE platform with Dassault scoring 7 for analytics and simulation.

Dassault scores highly for data collection (8) with the focus area on enabling collaboration so that users can locate the correct information and manage the product life cycle end-to-end from R&D, product development, including 3D design, costing analysis, and remaining compliant to managing supply chains and delivering marketing plans. The premise is to create a digital thread by blending tools for design, ERP, simulation, and providing a cloud-based ecosystem so that users can add on capabilities.

Dassault Systèmes would score higher overall with more transformative technologies, such as AR/VR, and higher than 7 for accessibility if elements of the 3DEXPERIENCE platform were available via mobile apps in the same manner as the fashion-orientated solution, Centric Software.

IMPLEMENTATION

IMPLEMENTATION SCORE: 69.5

The 3DEXPERIENCE platform serves both mid-sized and large companies in various industries, such as automotive, aerospace, engineering, consumer packaged goods, energy processes and utilities, high tech, life sciences, marine and offshore, and industrial equipment.

Dassault scores 8 for industry expertise with end-to-end engagements (from R&D to commercialization) at Toyota and PSA Groupe, as well as in the aerospace sector at Boeing and Airbus.

The company is marked down for geographic spread (6) as the ENOVIA platform is only available in English, Turkish, Swedish, and Polish.

ABI Research understands that the platform is more geared toward those that are experienced in using PLM software, rather than novices, so new users require several training sessions to be able to use it effectively; reducing the company's score for scaling on the platform to 6.

The majority of the revenue coming from the 3DEXPERIENCE platform comes via direct sales; however, Dassault is rapidly onboarding partners to promote the 3DEXPERIENCE platform.

Currently, Dassault scores 8 for its GTM strategy. Partners include business partners (555 at the time of writing) that are looking to use the 3DEXPERIENCE to drive innovation and enable business transformation on behalf of clients. Service partners (24) via strategic alliances with leading IT systems integrators, consulting firms, and services providers cover the combined ecosystem of Dassault Systèmes. The 164 software partners include innovative developers and ISVs that create software applications, which are fully integrated with Dassault Systèmes product lines. Finally, 71 technology partners are validating its solution components, which run in concert with Dassault Systèmes PLM solutions and 3DEXPERIENCES.

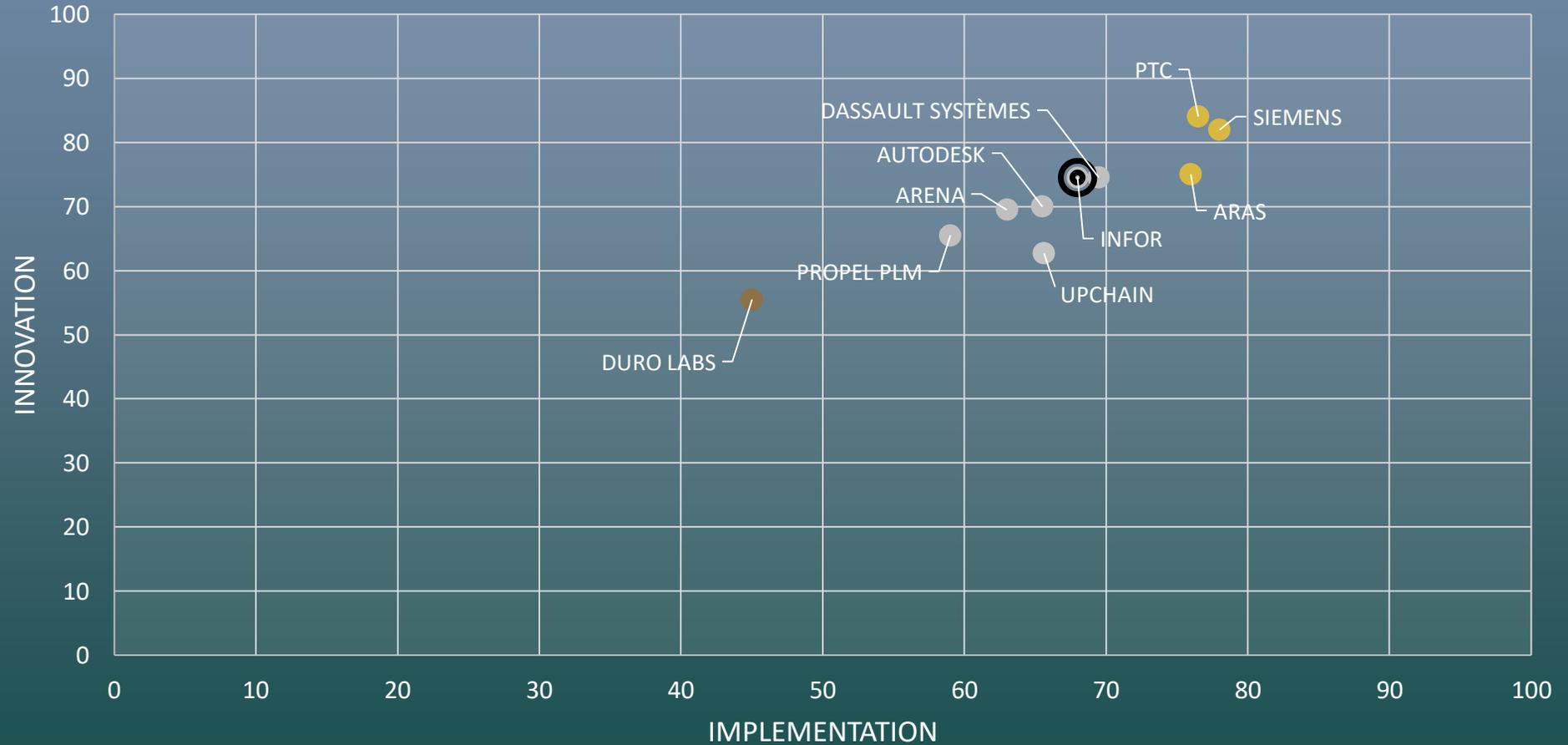ABI RESEARCH COMPETITIVE RANKING
PLM SOFTWARE

infor

OVERALL: 71.3 | INNOVATION: 74.5 | IMPLEMENTATION: 68.0 | RANK: 5

INNOVATION

infor

INNOVATION
SCORE: 74.5

PLM from Infor comes in three varieties: PLM for Fashion (out of scope for purposes of this report), PLM for Process, and PLM for Discrete.

Infor scores 8 for supporting digital threads and 9 for analytics and simulation. PLM Discrete manages information flows between CAD systems, examines the effects of engineering changes, and enables suppliers, partners, and customers to gain insight on the impact of changes. The PLM solution integrates with ERP systems.

PLM for Process, formerly branded as Optiva, has been tailored to the needs of firms in the food, beverage, chemicals, and life science sectors. Workflows aim to keep the project moving by reminding the different staff members of their role in a project.

In addition, clients can integrate PLM for Process with other applications and workflows, especially the ERP system to electronically integrate items and formulas, reducing the risk of data inaccuracy and faster time to manufacture once a project and formula have been approved by all the required parties. The platform can help clients understand the characteristics of different materials and how changes impact cost. Data comparisons offer the ability to see the differences and commonality of multiple formulas, specifications, labels, what if analysis, and more.

Not only scoring well for analytics and simulation, Infor scores 8 for traceability and compliance with PLM for Process; enabling process manufacturers to be compliant regarding labeling and/or product formulas.

The analytical capabilities and focus on compliance make the Infor solutions stand out.

IMPLEMENTATION

IMPLEMENTATION
SCORE: 68.0

PLM for Process is tailored to the needs of firms in the food, beverage, chemicals, and life science sectors. Infor PLM Discrete targets high tech and electronics, automotive component, industrial manufacturing, and aerospace and defense manufacturers, with Infor scoring 9 for industry expertise.

The company scores 7 for geographic spread as Infor Discrete has new localizations and supports English, Japanese, Chinese, French, German, Spanish, and Portuguese.

In terms of scaling on the platform, Infor scores 6 with PLM Discrete segmenting users by type of role, enabling line staff to manage revisions, while managers can tackle operational issues, and executives can focus on launch successes and margins.

Infor scores a 5 for GTM strategy as its partner network for PLM solutions is limited. There are 22 channel partners (independent companies that resell, implement, or support Infor products for a specific territory). Currently, there are 8 for PLM Process and 14 for PLM Discrete.

Alliance Partners are companies that create joint solutions by leveraging each other's assets, such as software, services, or industry expertise. There are 6 alliance partners for PLM for Process and PLM Discrete has 8.

Finally, Delivery Partners work with Infor Consulting Services (ICS) to enable customers to maximize the value of their Infor investments; however, currently, there is only 1 partner for PLM for Process and 3 for PLM Discrete.

The partner networks as it stands is dwarfed by companies like Dassault Systèmes and PTC. However, Infor is experienced in creating partner networks with a partner network for its ERP solutions approaching 470 firms.

ABI RESEARCH COMPETITIVE RANKING

PLM SOFTWARE

OVERALL: 67.8 | INNOVATION: 70.0 | IMPLEMENTATION: 65.5 | RANK: 6

AUTODESK

OVERALL: 67.8 | INNOVATION: 70.0 | IMPLEMENTATION: 65.5 | RANK: 6

AUTODESK INNOVATION *VERSUS* IMPLEMENTATION FOCUS

PLM SOFTWARE COMPETITIVE RANKING

ABIresearch® TRUSTED INTELLIGENCE SINCE 1990
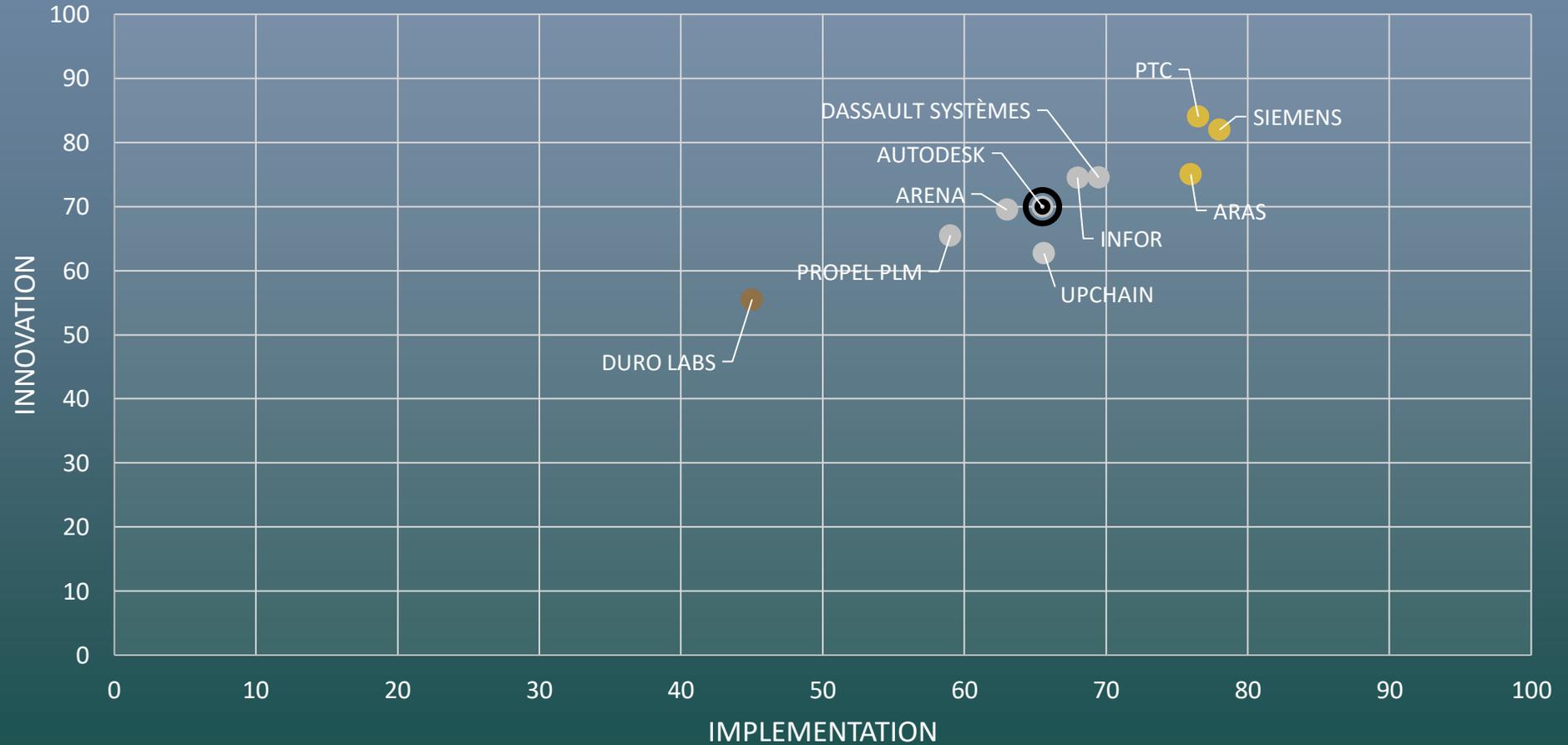
INNOVATION

AUTODESK®

**INNOVATION
SCORE: 70.0**

Autodesk offers solutions for PDM (Autodesk Vault), PLM (Autodesk Fusion Lifecycle 360), and Vault PLM, combining PDM and PLM. Autodesk Vault integrates with other Autodesk Products, including Inventor Professional, AutoCAD Electrical and Mechanical, and other Civil 3D products; helping design teams effectively track workflows.

Autodesk achieves the highest score among vendors in this ranking for data collection (9) as Fusion Lifecycle 360 integrates with Computer-Aided Manufacturing (CAM), Electronic CAD (ECAD), Computer-Aided Engineering (CAE), procurement software, MES, CRM, and ERP applications; enabling clients to have a centralized hub for managing product data management, conducting generative designs, and supporting new product introductions. Fusion Lifecycle 360 integrates with other enterprise software providers, including Oracle, Salesforce, SAP, Infor, and Microsoft.

By having a hub for datasets, customers can manage workflows that support product launches via dashboards and analyze the impact of any changes to plans; giving a score of 8 for supporting digital threads. The company is one of the leaders for accessibility (scoring 8) with Fusion Lifecycle 360 supporting the data collection and digital threads by providing the platform as a SaaS solution.

In terms of future development, Fusion Lifecycle 360 will focus on enabling customers to migrate from 2D to 3D designs, improving the analytics capability of the platform; currently, Autodesk scores 6 for both simulation and analytics, as well as supporting new technologies. The PLM solutions also lack robust capabilities for ensuring compliance and traceability.

While the biggest point of differentiation is enabling customers to integrate CAD drawings across the value chain, the company needs to replicate the likes of Propel PLM and add more traceability and compliance tools to the solutions to round out the proposition.

IMPLEMENTATION

AUTODESK®

IMPLEMENTATION
SCORE: 65.5

Founded in 1982, Autodesk has its headquarters in San Rafael, California, and employs more than 10,300 people worldwide. For fiscal 2020, the company reported annual recurring revenue of US$3.43 billion. During the 1Q 2021 earnings call, Autodesk reported that April 2020 was the fastest growing month for new user acquisition and in Q3 2021 reported over 120,000 Fusion 360 commercial subscriptions, up 25k from Q2 .

Autodesk can point to several examples of customer scaling on its platform, as well as vertical expertise, scoring 7 for each criteria. The company reported a semiconductor company adding more integrated functionality to its instance on top of using Fusion for designing its printed circuit boards design and BASF increasing its user base to 2,000 during the quarter.

Autodesk uses a mix of direct and indirect sales channels, scoring 7 for GTM strategy. The indirect channel accounts for 70% of revenue and will continue to do so for the foreseeable future. Autodesk has 1,500 resellers and distributors worldwide. The indirect channel model consists of a two-tiered distribution structure, with distributors selling to resellers, and a Tier One approach whereby Autodesk sells directly to resellers.

Autodesk received 6 for geographic spread because Fusion Lifecycle is currently only available for purchase in the United States, Canada, the United Kingdom, Ireland, Norway, Sweden, Finland, Denmark Benelux, and Germany. This puts the company at a disadvantage compared to companies like Siemens, PTC, and Aras.
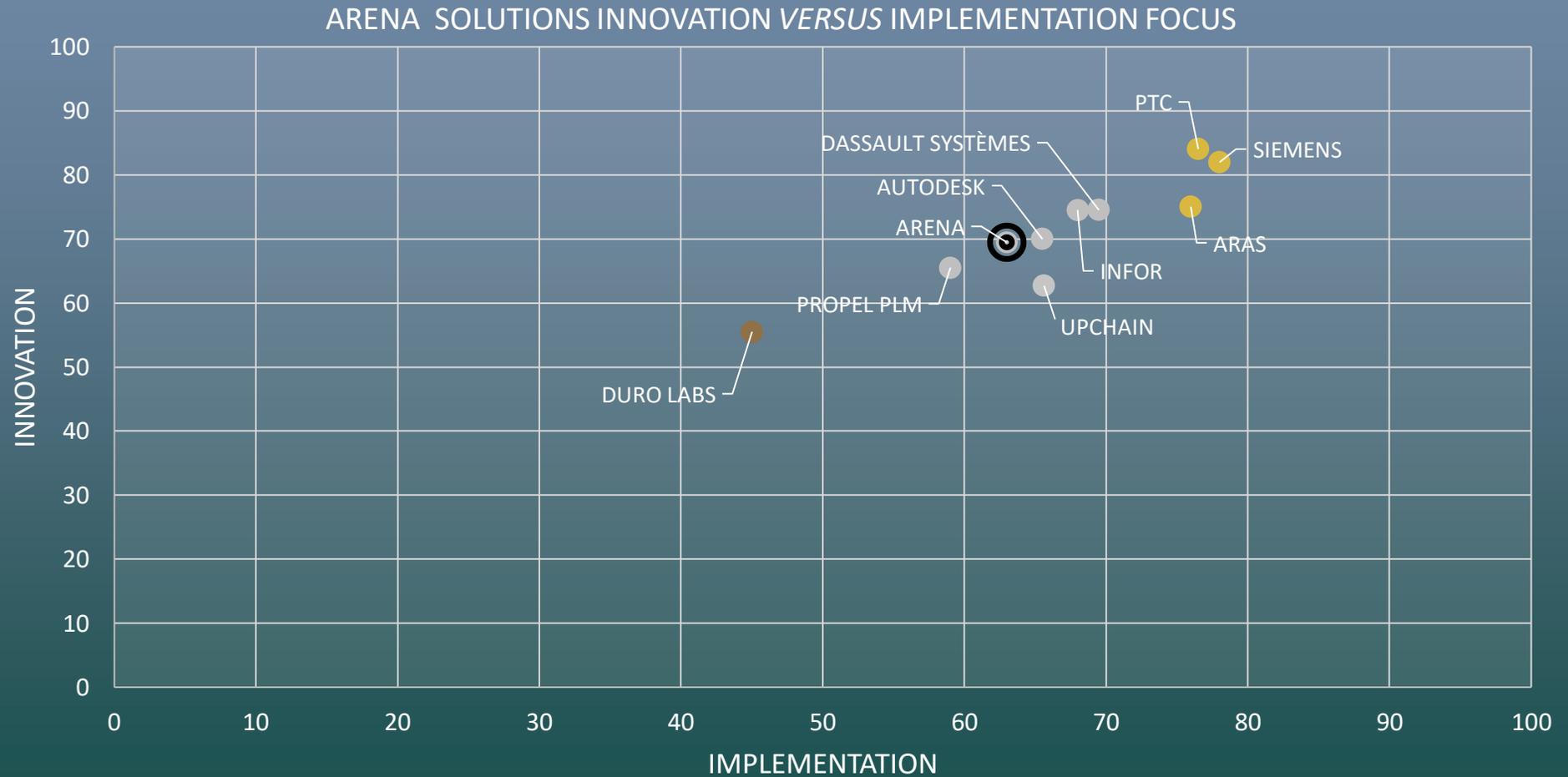
ABI RESEARCH COMPETITIVE RANKING

PLM SOFTWARE

arena

OVERALL: 66.3 | INNOVATION: 69.5 | IMPLEMENTATION: 63.0 | RANK:7

INNOVATION

INNOVATION
SCORE: 69.5

Arena's PLM solution, which scores 8 for supporting digital threads, helps position the company as a hub for design teams, contract manufacturers, engineers, operations personnel, and the supply chain; providing a digital thread from product conception all the way through design and manufacturing, and up to the end of the cycle. The cloud PLM solutions helps clients manage BOM, parts lists, change orders, and other processes to accelerate product development.

Arena scores 7 for accessibility with the PLM platform available as a SaaS-based platform.

Scoring 7 for data collection, Arena PLM is allied with its QMS solutions and simplifies processes for managing items, such as parts, with documents related to product changes and quality issues. Both types of solutions integrate with supply chain tools, MCAD and ECAD applications, and ERP and MES systems.

Analytics in the Arena solutions is underpinned by GoodData to help users manage requirements, change requests, make quality improvements, and provide business insights via analytics capabilities; scoring 6 for analytics and simulation.

The company scores 8 for traceability and compliance with the solutions developed to ensure regulatory compliance for the Food and Drug Administration (FDA), International Organization for Standardization (ISO), ITAR, Export Administration Regulations (EAR), and environmental compliance.

Arena would have scored higher with the inclusion of cutting-edge technologies, such as AR, in the solution, but will have access to PTC's capabilities next year, assuming that the acquisition goes through.

IMPLEMENTATION

IMPLEMENTATION
SCORE: 63.0

Arena scores 6 for geographic spread and industry expertise. The company is used by 1,250 companies across 80 countries.

Key verticals include the electronics, transportation, network equipment, and medical device sectors. Arena PLM is used by more than 80,000 individuals with challenger brands Square, Nutanix, Citrix, and Peloton being notable clients.

The client base is impressive, but by only having the platform available in English, French, and Spanish limits the company's scores for geographic spread.

Having little documentation and resources available on the platform marks Arena down as 5 for scaling on the platform.

Arena scores 7 for IT integration as the solution integrates with ERP providers, such as SAP, Oracle, NetSuite, Microsoft Dynamics, QAD, Sage, xTuple, Rootstock, and Kennedy. The company's integration partners include Altium, XPLM, and OrCAD. Channel partners include eBom, Uptima, and Saros.

The company's GTM strategy includes consulting partners, channel partners, application partners, and solution partners; scoring 7 for this criteria. ABI Research expects Arena PLM to be a valuable addition to PTC's partners.
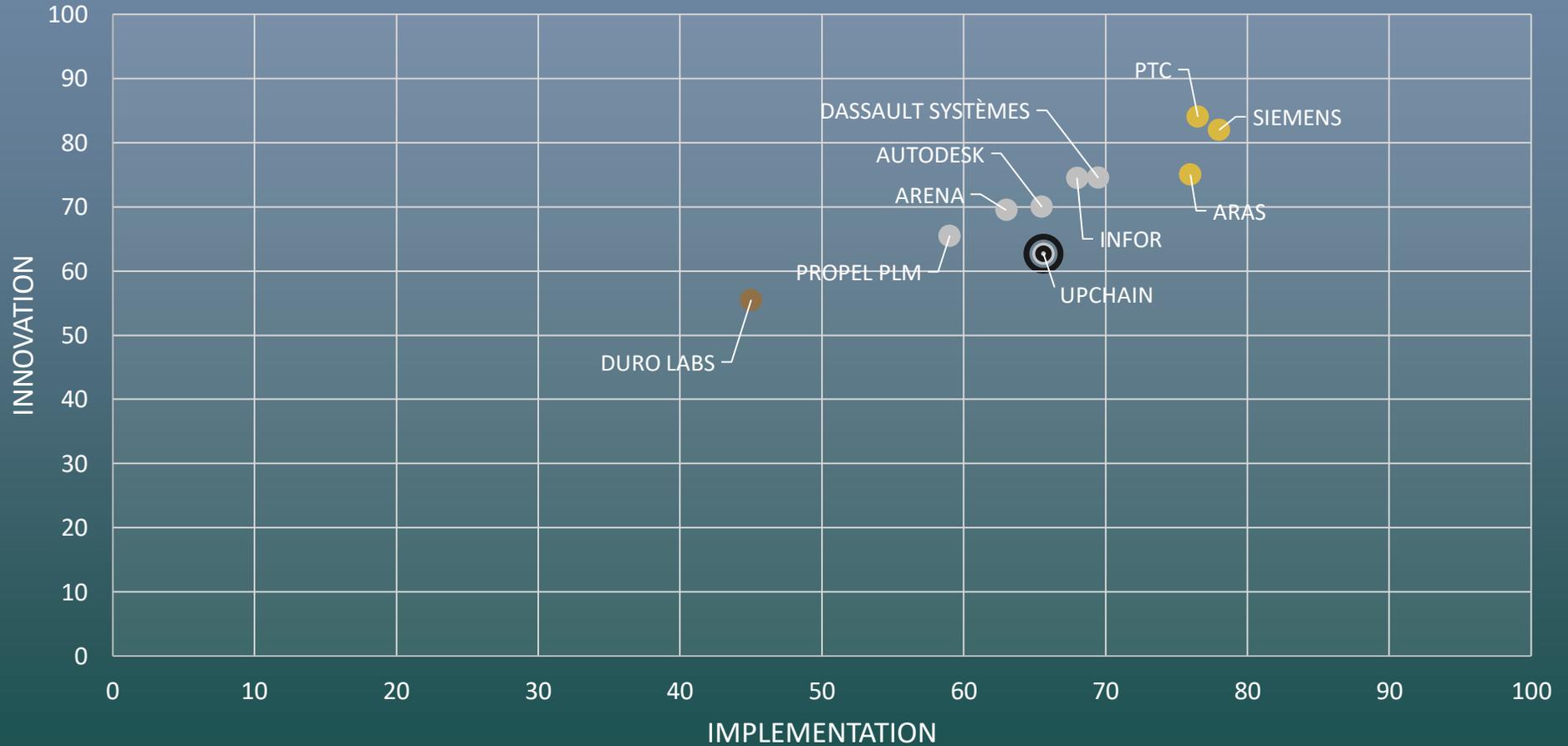
OVERALL: 64.0 | INNOVATION: 62.5 | IMPLEMENTATION: 65.5 | RANK: 8

UPCHAIN PLM INNOVATION *VERSUS* IMPLEMENTATION FOCUS

INNOVATION

upchain

INNOVATION
SCORE: 62.5

Toronto-headquartered Upchain was founded in 2015. Upchain PLM is a cloud platform and scores well for data collection (7) and supporting digital threads (7) by combining PDM and PLM capabilities into a single solution.

Unlike other solutions, Upchain's PLM does not require the customer to replace existing solutions; Upchain PLM overlays existing technologies and provides built-in API integrations so customers can move product data wherever they are needed. Upchain looks to "Connect the Chain" with its cloud architecture, data model, UX, and implementation methodology.

The platform can be used with any major CAD program through CAD plugins, including for NX, Creo, Catia, Inventor, Solid Edge, and SOLIDWORKS. In addition, Upchain PLM includes BOM integrations and enables users to see every step of the launch process, monitor revisions, understand the effects on operations, and spot potential bottlenecks and roadblocks before they occur all via dashboards; giving Upchain a score of 7 for analytics and simulation.

Upchain also scores 7 for accessibility with Upchain PLM designed as an out-of-the-box solution with commonly used forms, templates, and workflow processes. The solution is designed as a hybrid cloud solution with data remaining on on-premises servers, while the functionality is stored in the cloud. The company would score higher for accessibility if the solution were available via a mobile app.

The company's score for innovation would be higher if the solution included more cutting-edge technologies, such as AR and Artificial Intelligence (AI). Furthermore, Upchain PLM provides transparency regarding the creative process, but there needs to be more focus on providing evidence of compliance to regulations and product standards.

IMPLEMENTATION

upchain

IMPLEMENTATION
SCORE: 65.5

In 2018, Upchain raised US$7.4 million from a Series A funding round that was led by First Ascent Ventures and BDC. In addition to its headquarters in Toronto, there are three additional offices in Croatia. At the time of writing, the headcount is 85 employees and growing rapidly with 34 vacancies advertised on the website.

Upchain stands out as it tailors its solutions to meet the needs of SMEs, an often-overlooked segment of the market, as well as large enterprises. Upchain will assist very large clients with implementing the solution, typically getting them get up and running in 14 days and scoring 7 for nimbleness and 7 scaling on the platform.

Upchain users access the solution via a set of defined roles or personas—engineer, project manager, procurement, and manufacturing planning. Upchain also includes Edge Vaulting as an implementation option, which automatically optimizes for the best UX based upon specific factors like user location, privileges, data sources, workload, type of data requested, and corporate governance standards. The horizontal, rather vertical market focus results in Upchain scoring 6 for industry expertise.

However, Upchain scores 7 for geographic spread as the interface is available in 14 languages, including Chinese, Hindi, Japanese, Turkish, and European languages.

The company's GTM strategy is a mix of direct salespeople and partners. Upchain's partner network includes affiliate partners (make referrals, demo the solution), solution partners (certified resellers/Value-Added Resellers (VARs)), and technology partners (integrate Upchain with engineering design software, such as SOLIDWORKS, Catia, and/or enterprise software, such as SAP).

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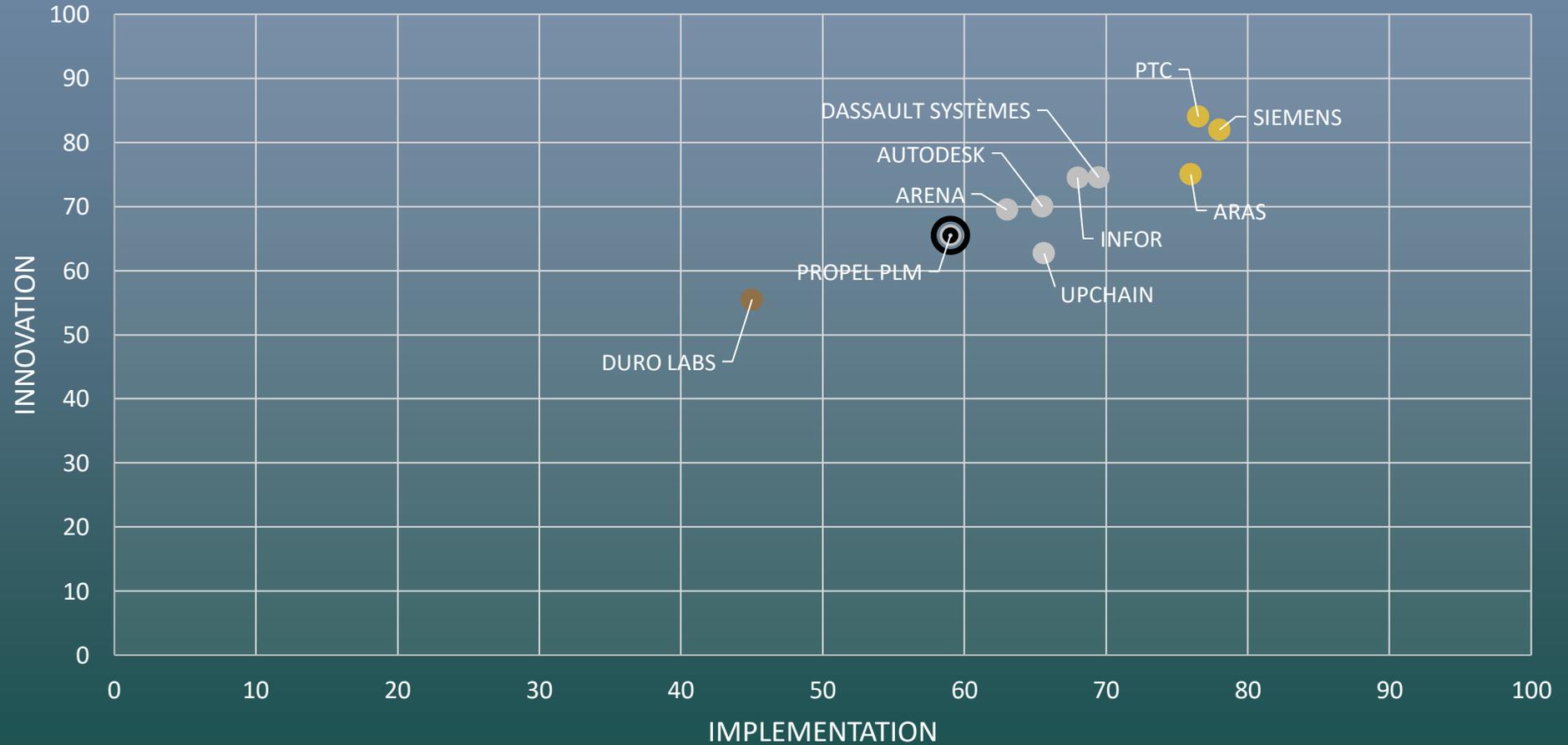
PLM SOFTWARE

propel

OVERALL : 62.3 | INNOVATION: 65.5 | IMPLEMENTATION: 59.0 | RANK: 9

OVERALL : 62.3 | INNOVATION: 65.5 | IMPLEMENTATION: 59.0 | RANK: 9

PROPEL PLM INNOVATION *VERSUS* IMPLEMENTATION FOCUS

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INNOVATION

propel

INNOVATION
SCORE: 65.5

Having been built on the Salesforce platform, Propel PLM enables clients to tie together their product creation and customer data. Propel scores 6 for supporting manufacturers' digital threads as the platform supports clients' processes for managing quality, requirements, projects, and changes. Designers and engineers are working on the same instance.

The platform's ability to show how design changes and customer requests concerning the BOM affect costs means that Propel PLM scores 7 for analytics and simulation. Furthermore, procurement and manufacturing teams can collaborate via dashboards in order to more accurately control supplies and obtain the best prices, with approvals reports via a smartphone; scoring 7 for accessibility. Propel would score higher for accessibility with the solution available as a low-code/no-code design platform.

Unlike vendors with a background in CAD design, Propel PLM has expertise in supporting process manufacturers. This translates into Propel PLM top scores with 9 for traceability and compliance as this is a focus area for Propel PLM solution.

The company looks to help manufacturers meet regulations and be compliant with environmental specifications, such as Restriction of Hazardous Substances Directive (RoHS), Waste Electrical & Electronic Equipment (WEEE), Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), China RoHS, JEDEC, Japanese Green Initiative, and Conflict Minerals standards. In addition, Propel looks to help manufacturers ensure their configurations meet local markets' standards and comply with different regulatory requirements to compete and sell globally.

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IMPLEMENTATION

propel

IMPLEMENTATION
SCORE: 59.0

Propel PLM works with Desktop Metal, Samsara, and Peak Design to help accelerate the firms' product launches. The company scores 7 for geographic spread because it can support clients across the globe with interfaces available in Danish, German, English, French, Italian, Japanese, Korean, Dutch, Norwegian, Portuguese, Russian, Spanish, Swedish, Thai, and Chinese.

Propel PLM has launched a regulatory solution dedicated to the health & life sciences industry and medical device companies. The solution allies the specific compliance needs of the industry, while helping teams improve product quality and bring products to market faster; scoring 8 for industry expertise.

The company scores well for scale on the platform (7) as customers report that they can quickly get up and running on the platform and take advantage of the user training resources.

Propel PLM scores 4 for GTM strategy as other vendors have both broader and deeper partner networks. Propel PLM has formal partnerships with Rootstock Software (a provider of cloud ERP on the Salesforce Cloud Platform; see ABI Research's Software Applications in the Manufacturing Setting report (AN-5273), Onshape (PTC's SaaS design platform), Inspirage (an integrated supply chain specialist firm), Customertimes (a cloud consulting and system integrator), and consulting firm Slalom.

Propel PLM is more reliant on its direct sales channels than many others in this competitor ranking and so it risks missing out on opportunities to engage with potential enterprise customers that often rely on service partners to introduce new innovative solutions.

ABI RESEARCH COMPETITIVE RANKING
PLM SOFTWARE

durolabs

OVERALL: 50.5 | INNOVATION: 55.5 | IMPLEMENTATION: 45.0 | RANK: 10

durolabs

DUROLABS INNOVATION *VERSUS* IMPLEMENTATION FOCUS
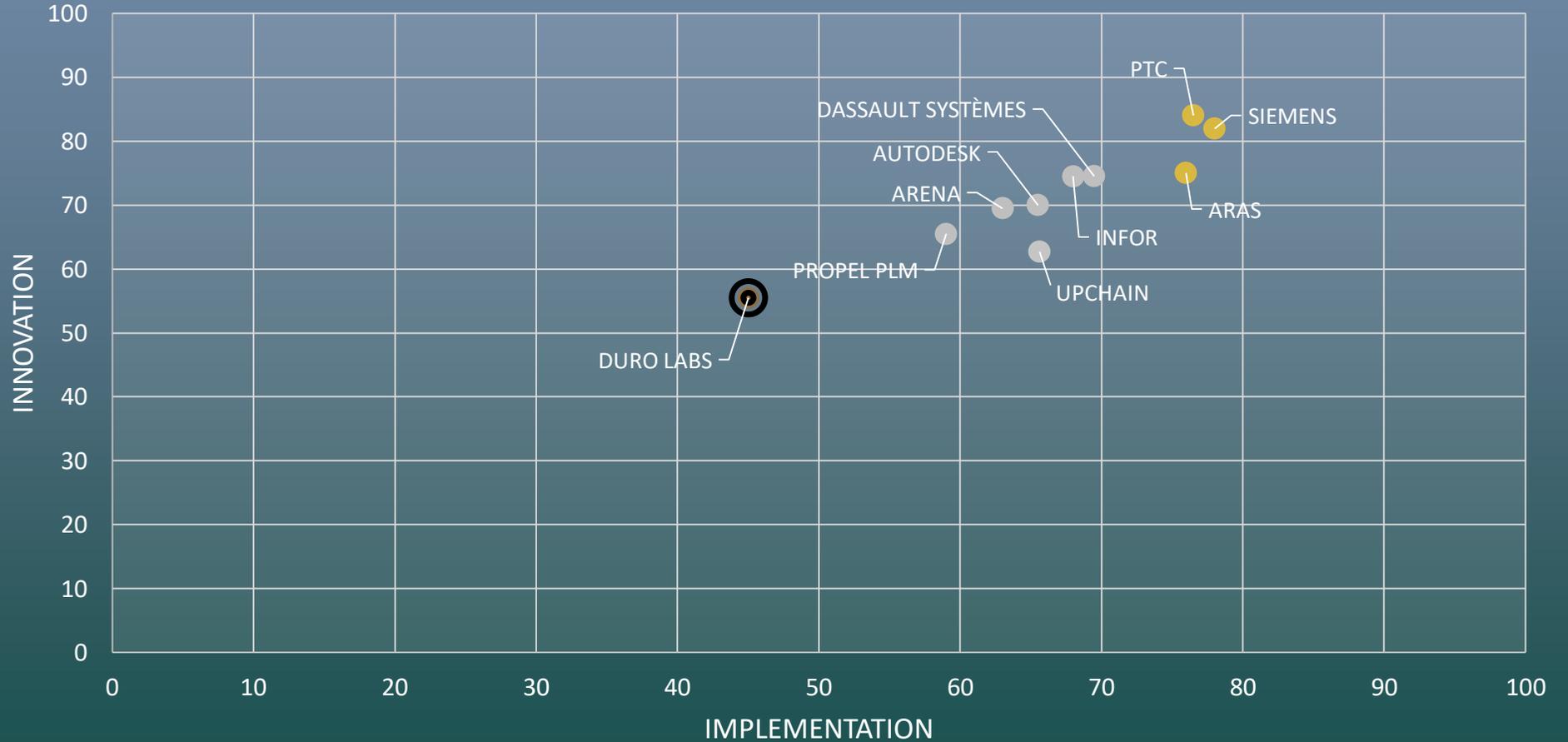
INNOVATION

INNOVATION
SCORE: 55.5

Founded in 2017, Los Angeles-based manufacturing Duro Labs helps manufacturers move away from managing their product development activities with spreadsheets.

Duro Labs scores 6 for data collection with the company able to integrate with PTC 's Onshape CAD platform and provides workflows for revision management and dynamic supply chain management. Furthermore, revisions can be made in the Onshape platform thanks to the Duro PLM app; giving the company a score of 8 for accessibility.

The company is a good fit for manufacturers just beginning to appreciate the potential for PLM and scores 7 for helping firms with their digital threads. Data migration is also offered as a service and the PLM Professional offers clients simplified workflows, CAD plug-ins, and the facility to normalize production data, reducing operational risks by scanning the availability of parts and managing change orders, variants, and revisions; processes that inexperienced PLM users might neglect.

Duro Labs scores 7 for accessibility and 8 for UX as the company aims to have new clients using the cloud platform in a matter of hours. Clients can tailor the platform to their product categorizations and part numbering schemes.

In terms of analytics and simulation, Duro Labs scores 5 as the platform has a centralized mechanism for tracking component costs and lead times so that teams can get products to market as fast and as cost effectively as possible, scoring 6. The solution currently does not the include the ability to go beyond basic reporting and undertake scenario planning.

Duro Labs is an effective hub for engineering, manufacturing, and supply chain data, but needs to support users with more sophistical tools and plugins.

IMPLEMENTATION

durolabs

IMPLEMENTATION
SCORE: 45.0

While the platform has some powerful attributes, Duro Labs does not fare well when it comes to scores for implementation.

As the company was only established in 2017, it is understandable that the focus is on developing the platform; client support and building the installed base should now be higher priorities for the company.

Duro Labs scored well for accessibility with customers able to get up and running quickly; there is no evidence of supporting materials to help it scale on the platform leading to a score of 4 .

A bright spot is that Duro Labs scores 6 for IT Integrations as the platform has plugins for CAD software platforms and APIs.

The biggest weakness is the lack of partners, Duro Labs needs to build relationships with potential solution partners and resellers to get the solution more widely used by manufacturers. Currently, the GTM strategy scores just 3.

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