FROST & SULLIVAN

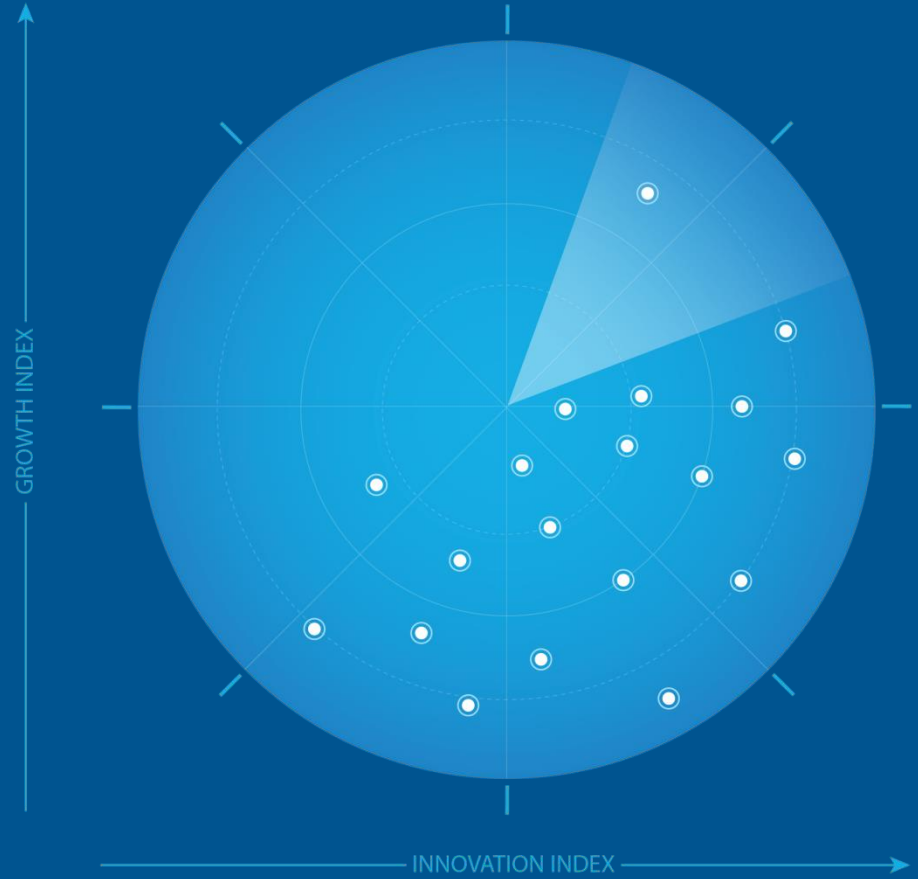# Frost Radar™: Product Lifecycle Management, 2024

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A Benchmarking System to Spark Companies to Action - Innovation That Fuels New Deal Flow and Growth Pipelines

Strategic Imperative and Growth Environment

Strategic Imperative

Factors Creating Pressure on Growth

- Product lifecycle management (PLM) manages the entire lifecycle of a product through ideation, design, production, deployment, and disposal. It involves a holistic approach that enables a company to manage its products efficiently and effectively by providing a platform for product development and introduction.

- PLM is a versatile technology that can fulfill a company's needs in product development and manufacturing, bill of materials (BOM) management, supply chain collaboration and management, data management, and more. It also breaks down information silos, creating a digital thread that connects processes, teams, and information throughout a company.

- The PLM industry has been transforming, influenced by trends regarding the competitive environment in the manufacturing world, cloud deployment, supply chain demands, compliance and sustainability requirements, AI breakthroughs, data management needs, and companies' attempts to introduce themselves into a digital thread-centric strategy.

Source: Frost & Sullivan

Strategic Imperative

Factors Creating Pressure on Growth

- The transformation is reflected in higher revenue, more cloud-native start-ups, an innovation that breeds new features in software offerings, acquisitions, and strategic partnerships, a growing partnership ecosystem for the provision of specialized services, and companies that had little to no experience with PLM software's potential gaining access to the market.

- Software-as-a-service (SaaS) has revolutionized how companies fulfill their software requirements. Before, significant investments in server infrastructure, IT teams, and maintenance were needed to deploy PLM. With cloud-based solutions, users can access all PLM capabilities remotely while the vendor handles server infrastructure, maintenance, and updates. The SaaS model also allows vendors to have more predictable revenue streams.

- PLM becomes more valuable when technological advancements allow for improved business models, data gathering, planning, and decision-making.

Source: Frost & Sullivan

Strategic Imperative

Factors Creating Pressure on Growth

- The breakthroughs in cloud and AI technology have certainly been revolutionary, while progress in the manufacturing sector also indirectly benefits PLM: new data needs to be managed, with PLM being the top choice for engineering data management.

- Competitive intensity has two levels. On the end-user side, companies constantly try to gain an edge over competitors. PLM software can provide it by reducing time to market, streamlining the development process by reducing waste and costs, and significantly decreasing human error. On the vendor side, newcomers—many small or medium-sized businesses (SMBs)—are in a fierce race to satisfy emerging PLM demands. Traditional PLM vendors compete against cloud-native start-ups, which often specialize in specific industries, to provide the most useful and complete offerings. PLM vendors are constantly working on integrations with computer-aided design (CAD), enterprise resource planning (ERP), manufacturing execution systems (MES), quality management systems (QMS), and other software from different companies to keep their solutions as versatile as possible to appeal to potential customers that may already be using one of the offerings.

Source: Frost & Sullivan

Growth Environment

- A PLM vendor's growth will depend on the following factors:

  - The ability to develop robust cloud-based offerings and implement a SaaS model.

  - Innovative new features that improve its offerings.

  - Strategic partnerships with other vendors in the software field to develop integrations between PLM, CAD, ERP, and others, as well as connections with system integrators and IT consulting firms worldwide to create an ecosystem capable of extending reach and providing trustworthy services.

  - A cohesive software portfolio that can fulfill clients' needs in an evolving digital threat environment.

  - Specialization according to industry and regulatory environment.

  - Solutions designed explicitly for SMBs regarding capabilities, users, and pricing.

- Businesses are embracing sustainability. Customers are more conscious of their environmental impact, and governments provide financial incentives for companies to follow environmental, social, and governance (ESG) guidelines. PLM is essential in gathering data regarding compliance with environmental regulations and reducing waste in the product development.
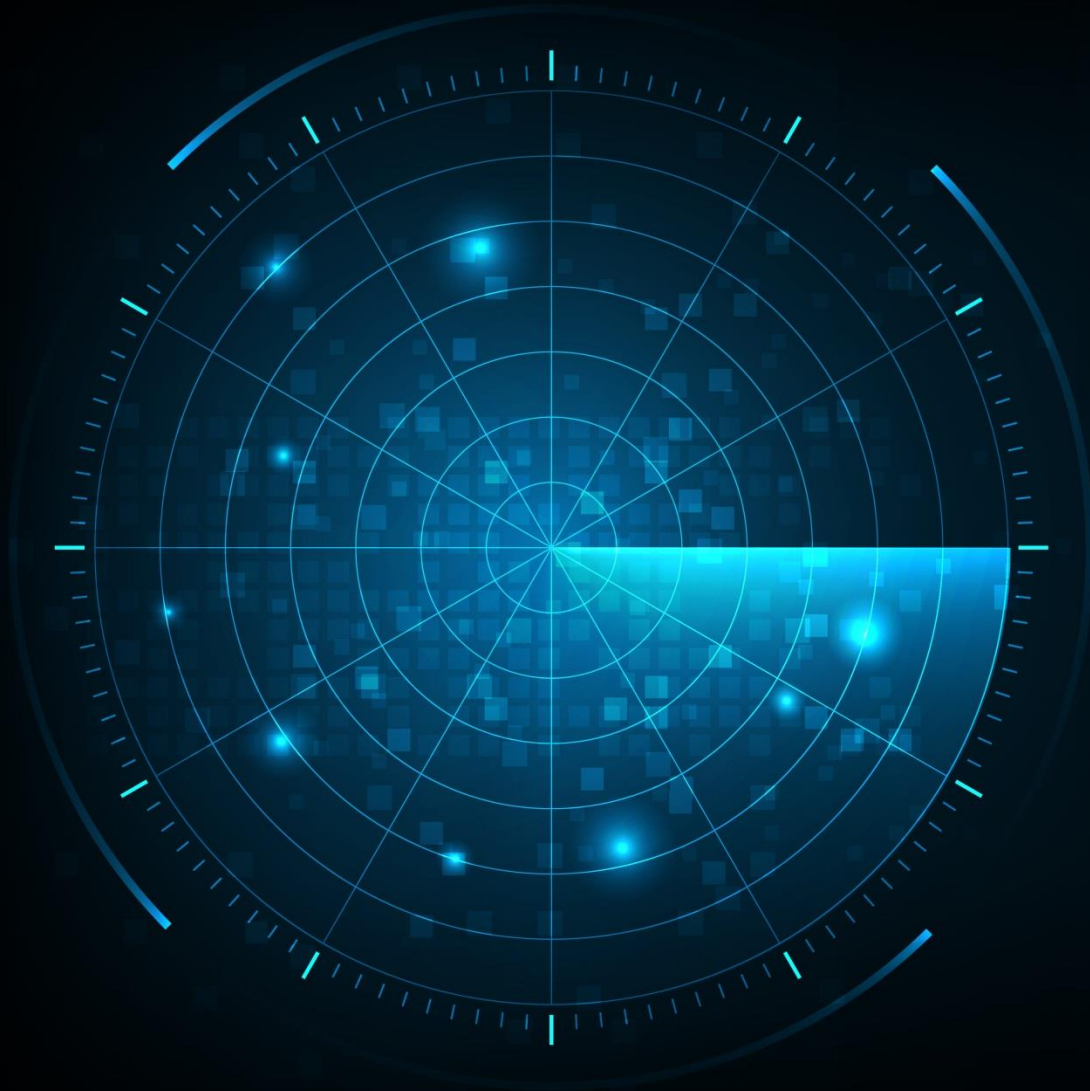
Source: Frost & Sullivan

Growth Environment

- During the COVID-19 pandemic, companies became much more aware of the severity of supply chain disruptions in their operations. PLM offers BOM management capabilities that allow for collaboration with component and raw material suppliers. AI has had a profound impact on the manufacturing world. PLM will enable users to calculate the most cost-effective sourcing options and find alternatives during a supply chain disruption. Supply chain-wide information gathering can help companies achieve a net zero supply chain, ensuring all suppliers comply with ESG responsibilities and regulations. AI can also improve the user experience by hiding unused tabs/features in a user interface and supporting predictive maintenance.

- Top competitors have developed an extensive partner ecosystem consisting of certified value-added resellers (VARs) and service providers so that they can focus on software development and sales while allowing partners to provide client services. An added advantage is a deeper reach in emerging PLM markets, such as Asia-Pacific (APAC), because the partners are more in tune with client needs and better understand language, culture, laws, and regulations.
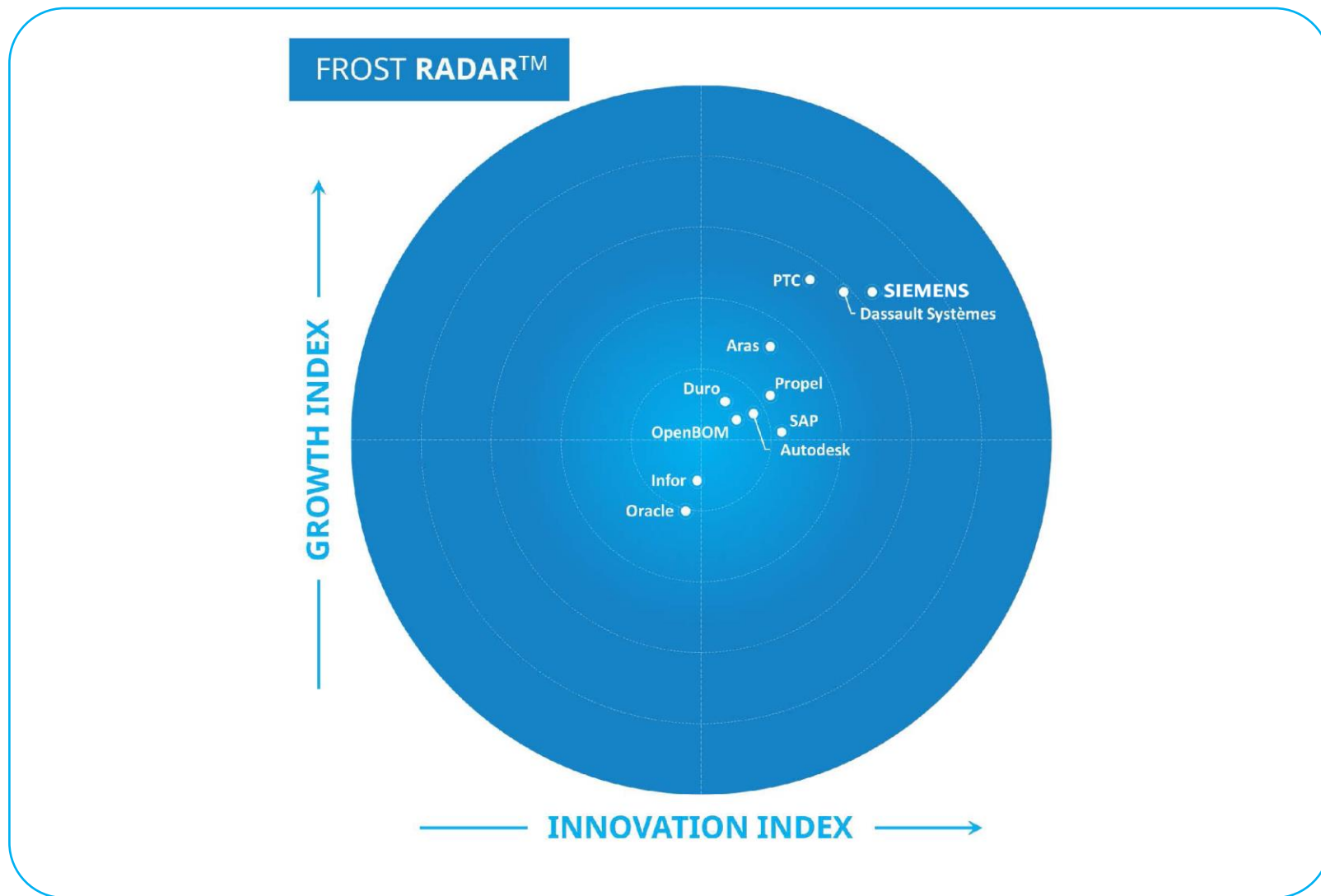
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Frost Radar™
Competitive Environment

- The top 5 competitors in the PLM industry (Dassault Systèmes, Oracle, PTC, SAP, and Siemens) generate about 59% of the revenue. About 40 companies participate with their own software offerings and a large ecosystem of VARs, certified service providers, and vendor-agnostic service providers. Dassault Systèmes, PTC, and Siemens have been exhibiting strong growth, some consistently hitting double-digit growth over the last few years.

- Cloud-native PLM start-ups have experienced triple-digit growth in recent years, increasing and attracting SMBs that want to enjoy PLM benefits. Growth also is happening in the large service provider ecosystem as companies new to the PLM world or those moving from on-premises to cloud-based systems require training, implementation, and integration services. Many of the top PLM vendors rely on partners to provide all client services.

- Recent examples of industry consolidation include PTC's acquisition of Arena Solutions, Autodesk's acquisition of Upchain, and Dassault Systèmes' acquisition of Centric Software. Acquisitions have also happened in the service ecosystem, allowing large IT consulting firms to enter the market.

- The 11 companies featured on the Frost RadarTM are the most representative of the current market landscape: well-established vendors that have been in the market for decades and continue to push their products toward new boundaries; midsized companies that continue to develop their market potential by either improving their own product or acquiring other sophisticated PLM software providers; and start-ups with unique practices and approaches to PLM software, specialization in a niche market, and/or cloud-native deployment at the core of their growth strategy.

Frost Radar™
Competitive Environment

- Frost Radar™ leaders Siemens, Dassault Systèmes, and PTC have led the way regarding capabilities, industry-specific solutions, customer alignment, cutting-edge technology development, market trend identification, and growth pipeline leverage.

- Siemens, the Innovation Index standout, has developed AI further than competitors. Its industry-specific PLM solutions provide users with the capabilities necessary to face the challenges of the current manufacturing landscape, and the Xcelerator platform puts Teamcenter at the center of a data management and interconnectivity strategy with the potential to transform companies' business processes. It also has an extensive partner ecosystem both for support and service provision.

- PTC, the Growth Index leader, has developed a robust partner ecosystem in APAC and has multiple technology partnerships that support its PLM offerings. It has oriented its business toward the cloud, connecting different offerings in the Atlas platform.

- Dassault Systèmes has a robust portfolio surrounding ENOVIA, its PLM offering. It has implemented AI extensively for BOM management and supply chain logistics. It has numerous partners and many capabilities to monitor environmental impact.

- Aras and SAP are solid competitors. Aras's platform enables connectivity among diverse business applications and a growing partner ecosystem. The Aras platform is freely accessible for users with limited capability requirements. SAP's ERP-PLM connection, specialized capabilities for different industry verticals, and a focus on ESG responsibilities are notable.

Frost Radar™
Competitive Environment

- Propel, Duro, and OpenBOM share a common trait: they are all start-ups that have disrupted the market and attracted the attention of SMBs and, increasingly, large companies. While part of the same phenomenon, each has distinctive features. Propel, the largest of the three, is built on the Salesforce platform, and its largest industry vertical is medical devices. Duro provides an out-of-the-box offering; its main industry vertical is space tech, and it has the only PLM solution available on Google's Cloud Marketplace. OpenBOM has an open and transparent approach, giving potential customers free access to training and basic capabilities and providing a blog (updated several times weekly)for information about PLM industry trends and OpenBOM's offerings. The ecosystem they create, whether by completing business partnerships, enlisting service providers, or developing integrations with other offerings, gives them a foundation for long-term success and more direct competition with established PLM vendors—reflected in their wins of larger clients.

- Vault PLM and Fusion Manage, part of Autodesk's complete CAD portfolio, are robust regarding integrations, data management, and sustainability options. Autodesk focuses on SMBs as clients.

- Oracle and Infor have considerable advantages that could help them catch up with the competition on the Frost RadarTM. Both have partner ecosystems that could be expanded to increase their growth potential. They have already developed AI, sustainability, and cloud capabilities, which are the building blocks that can take their offerings to the next level.

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Companies to Action:
Companies to Be Considered First for Investment, Partnerships, or Benchmarking

Company to Action: Siemens

Innovation

- Siemens has been heavily investing in cloud development, evidenced by progress in its Siemens Xcelerator platform that offers Siemens' extensive SaaS portfolio in an interoperable, flexible, and cyber-secure way while also giving access to the company's partner ecosystem and an evolving marketplace. It is the foundation for the Teamcenter lifecycle collaboration backbone, bridging the gap between data and processes.

- Siemens' investment in the cloud is reflected in its PLM SaaS offering for the industry, Teamcenter X. Partnered with AWS, Siemens has upgraded its cloud infrastructure to leverage containerization for better resource utilization. It has also invested in microservices for cloud and on-premises users and implemented data pipelines to help customers transition to the cloud.

- Teamcenter's capabilities are regarded as best in class for the PLM industry. Siemens closely follows sustainability requirements from its clients and has developed the Carbon Footprint Calculator to keep track of a product's environmental impact across its supply chain. Features to simplify collaboration across teams include the alignment automation between BOMs and design, allowing both to evolve at the same time.

Source: Frost & Sullivan

Company to Action: Siemens

Innovation

- Teamcenter has vastly improved its visualization rendering time and configuration management capabilities, allowing users to interact with a massive product and its parts. It also automatically updates a product's component environment when one is replaced, providing users with feedback on how to accommodate the change.

- Siemens is at the forefront in the AI realm, with outstanding capabilities in Teamcenter, including the Teamcenter Assistant, which suggests commands based on context, history, and usage frequency and serves as a novel training tool; the speech-to-text auto-generation of problem reports for field personnel; the auto-generation of BOMs, bills of process, and simulations; and the optimization of supply chains according to logistics and stability. For the future, Siemens has announced the application of AI to create photorealistic visualizations of products.

Source: Frost & Sullivan

Company to Action: Siemens

Growth

- Siemens is among the top 5 competitors in the PLM industry, experiencing double-digit growth in 2023. The development of its cloud offering, Teamcenter X, has been remarkable.

- Siemens has created a vast network of partnerships. It has established business partnerships with AWS, Microsoft, and NVIDIA to develop AI. With Microsoft, Siemens has developed Microsoft Teams AI for problem reporting, and with NVIDIA, it is developing photorealistic visualization tools. Siemens' partnership with SAP benefits customers with lower costs, flexibility, and faster time to value; moreover, it extends Teamcenter's reach by making SAP a reseller of the software and enabling further expansion into EMEA and process industries.

- Siemens has developed affordable versions of Teamcenter for SMBs, including Teamcenter Rapid Start and Teamcenter X Essentials. It also has an Early Customer Involvement program that allows users to provide input for future updates.

Source: Frost & Sullivan

Company to Action: Siemens

Growth

- Siemens' strategy is to go to market by industry and thus has developed tailored PLM offerings. The most advanced include Semiconductor Lifecycle Management, PLM for Component Manufacturers, PLM for Medical Devices, and PLM for Machine Builders. Upcoming offerings include Teamcenter for Consumer-Packaged Goods. It has also been widely adopted in the aerospace & defense and automotive industries; in the latter, it serves the largest EV producer, BYD, and 90% of OEMs in China.

- Siemens has one of the largest global networks of partners for reselling, service provision, and support. It has the highest percentage of revenue derived from services among the top competitors, which means users' needs can be fully covered by either Siemens or its partner ecosystem.

Company to Action: Siemens

Frost Perspective

- Siemens is among the leading competitors in the PLM industry thanks to its innovative strategy, best-in-class capabilities, and focus on staying at the forefront of new developments in AI and sustainability. Its vertical-specific approach provides clients with specialized offerings that best suit their needs, and expanding these offerings can potentially introduce PLM to new industries.

- Given the depth and complexity of Teamcenter and the Siemens Xcelerator, training must be a vital focus to ensure that users can take advantage of their extensive capabilities. Siemens already does this via the Xcelerator Academy and could leverage its partners to reach more clients. The Xcelerator Academy should also be updated with new features added to the Siemens portfolio.

- To continue achieving growth, Siemens should focus on two actions: Expand its reach into process verticals (the least developed markets for PLM), specifically focusing on the pharmaceutical industry since it will experience significant growth and Siemens has experience in the life sciences field.

- Continue expanding its APAC partner ecosystem because partnerships now are fairly concentrated in EMEA.

Source: Frost & Sullivan

Key
Takeaways

Key Takeaways

1 PLM vendors are turning toward cloud-based solutions because SaaS models are the most accessible, convenient, and reliable option for users and vendors alike. The subscription model has piqued the interest of SMBs, with cloud-native start-ups providing introductory knowledge and lower prices.

2 Vendors are developing industry-specific solutions with unique capabilities supporting strict compliance regulations.

3 Top competitors are growing their partner ecosystems to provide services, including training and implementation. Their role in developing integrations for PLM with other software—most importantly CAD and ERP —is key to deriving the full potential from PLM, allowing users to trial it, and making extensive use of their data.

Source: Frost & Sullivan

Key Takeaways

4 The most important development areas for PLM are supply chain and sustainability, which are deeply connected: many features added for the supply chain area are related to sustainability, such as material traceability and tracking of a product's environmental impact.

5 AI is the most recent technological disruption that most vendors have on their roadmap. The main competitors are leading the way with developing copilots, features to optimize supply chains in terms of cost and sustainability, and more.

Source: Frost & Sullivan

Frost Radar™: Benchmarking Future Growth Potential
2 Major Indices, 10 Analytical Ingredients, 1 Platform

GROWTH INDEX ELEMENTS

VERTICAL AXIS

Growth Index (GI) is a measure of a company's growth performance and track record, along with its ability to develop and execute a fully aligned growth strategy and vision; a robust growth pipeline system; and effective market, competitor, and end-user focused sales and marketing strategies.

- **GI1: MARKET SHARE (PREVIOUS 3 YEARS)**
  This is a comparison of a company's market share relative to its competitors in a given market space for the previous 3 years.

- **GI2: REVENUE GROWTH (PREVIOUS 3 YEARS)**
  This is a look at a company's revenue growth rate for the previous 3 years in the market/industry/category that forms the context for the given Frost Radar™.

- **GI3: GROWTH PIPELINE**
  This is an evaluation of the strength and leverage of a company's growth pipeline system to continuously capture, analyze, and prioritize its universe of growth opportunities.

- **GI4: VISION AND STRATEGY**
  This is an assessment of how well a company's growth strategy is aligned with its vision. Are the investments that a company is making in new products and markets consistent with the stated vision?

- **GI5: SALES AND MARKETING**
- This is a measure of the effectiveness of a company's sales and marketing efforts in helping it drive demand and achieve its growth objectives.

Frost Radar™: Benchmarking Future Growth Potential
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INNOVATION INDEX ELEMENTS

HORIZONTAL AXIS

Innovation Index (II) is a measure of a company's ability to develop products/services/solutions (with a clear understanding of disruptive Mega Trends) that are globally applicable, are able to evolve and expand to serve multiple markets, and are aligned to customers' changing needs.

- **II1: INNOVATION SCALABILITY**
  This determines whether an organization's innovations are globally scalable and applicable in both developing and mature markets, and also in adjacent and non-adjacent industry verticals.

- **II2: RESEARCH AND DEVELOPMENT**
  This is a measure of the efficacy of a company's R&D strategy, as determined by the size of its R&D investment and how it feeds the innovation pipeline.

- **II3: PRODUCT PORTFOLIO**
  This is a measure of a company's product portfolio, focusing on the relative contribution of new products to its annual revenue.

- **II4: MEGA TRENDS LEVERAGE**
  This is an assessment of a company's proactive leverage of evolving, long-term opportunities and new business models, as the foundation of its innovation pipeline. An explanation of Mega Trends can be found here.

- **II5: CUSTOMER ALIGNMENT**
  This evaluates the applicability of a company's products/services/solutions to current and potential customers, as well as how its innovation strategy is influenced by evolving customer needs.

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