

Ascentage

Industrial Software – Segment Spotlight M&A in the Manufacturing Software Ecosystem

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M&A in the Manufacturing Software Market

A Compelling Case for Driving Digital Transformation and Manufacturing Efficiency



Leveraging technology is critical to improving manufacturing and workforce efficiency and technology adoption will drive significant M&A in the next few years:

- Large, strategic software suppliers provide a range of products and functionality focused on the broader needs of their clients. However, to meet the demand for new engineering and manufacturing technologies, large strategics will need to develop or acquire domain-specific solutions.
- The concept and implementation of digital twins is still in its infancy and will require specific software components for efficient and maintainable models.
- As products and systems become more complex and integrate hardware, software, and electronics, the need for Model-based Systems Engineering which is leverage by manufacturing systems will be transformative to companies developing complex products. This will drive the need for MBSE products that more easily integrate and leverage overall systems data throughout the engineering and manufacturing eco-system.
- Products that connect and integrate quality management directly with manufacturing operations will change the dynamics of overall manufacturing efficiency.
- The concept of driving Overall Equipment Effectiveness (OEE) shows tremendous promise but requires less complex implementations, simpler ways to perform analysis, and improved ways to provide feedback to machine shop operators. These needs require that software vendors and solutions providers take a new look at the way machine shops operate.

Among manufacturing software technologies, we foresee continued consolidation but also high rewards for those that provide unique solutions which focus on quality management, data analysis and predictive analytics.



R. Drew Ogden
Managing Director
rdo@ascentageadvisors.com
+1 (603) 491 9168



Ralph Verrilli
Managing Director
rverrilli@ascentageadvisors.com
+1 (781) 4047

Manufacturing Software Market Update

Strategics As Well as Private Equity Firms Continue to be Acquisitive in the Space



- **Manufacturing Market Growth** – Manufacturing across almost all industries continues to grow which bolsters interest in solutions to manage and improve efficiency, cost control and supply chain management.
- **Large OEM’s Digital and Supply Chain Transformation** – Most large manufacturers are evolving their organizational mindset towards a digital transformation strategy. Manufacturers are seeking solutions that link the various constituents in their manufacturing operations, while also looking for solutions that bring the enterprise closer to their supply chain.
- **Strategics Extend Manufacturing Capabilities** – Strategics (e.g., Hexagon, PTC) are looking for point solutions that connect to MES systems to help their customers drive efficiency in the manufacturing process.
- **PE Backed Add-ons** – Private-equity firms that have platform investments in manufacturing software related companies (e.g., GI/Aras, Thoma Bravo/QAD, TA/Revalize) are aggressively looking for add-on acquisitions to complement their current offerings and drive growth.
- **Interest in Large-Scale (> \$25M) Manufacturing Platforms** – Private equity firms are actively seeking manufacturing software platform opportunities onto which they can bolt on additional solutions to extend the platforms reach across the enterprise
- **Domain-specific companies, especially in the ERP and asset management markets, continue to make interesting acquisition opportunities** – Manufacturers large and small want software products that are tuned to their needs without the need for costly customization. The strategics are addressing this by making acquisitions which are focused on specific markets and specific manufacturing operations.

Emerging Framework - Unified Namespace (UNS)

Aggregation and Sharing of Data for Industrial Internet of Things (IIoT)

What is the Unified Namespace Framework

- **Centralized Data Hub** – The Unified Namespace Framework serves as a single source of truth for all data and information within an enterprise, enabling seamless communication and collaboration across different systems and stakeholders, regardless of their underlying technology or vendor
- **Standardization and Organization** – By utilizing organization standards the UNS Framework allows for easy integration of data producers and consumers by connecting them to a common data lake, reducing the need for specialized engineering services
- **Event-Driven Architecture** – UNS is often implemented as an event-driven architecture, allowing for efficient real-time data sharing and operational efficiency.



Data Integration – How will the Unified Namespace Framework Affect the Market

- We have yet to see any vendors focus on this concept with either products or marketing materials.
- The concept, once evolved, will make the implementation of broad manufacturing and manufacturing analytics software, much more efficient.
- We expect to see manufacturing software vendors focus on acquisitions which will allow for efficient data aggregation and data cleansing.

Smart Manufacturing Components

Individual Components for Smart Manufacturing Exist

The Holy Grail of Smart Manufacturing is the seamless integration of individual components, all leveraging a Unified Namespace, while using AI and ML to optimize both the individual and overall processes

Manufacturing Execution Systems (MES) track and document the transformation of raw materials into finished goods, providing real-time production management to drive enterprise-wide compliance, quality and efficiency.

Distributed Control Systems (DCS) use decentralized elements to control dispersed systems, such as automated industrial processes or large-scale infrastructure systems.

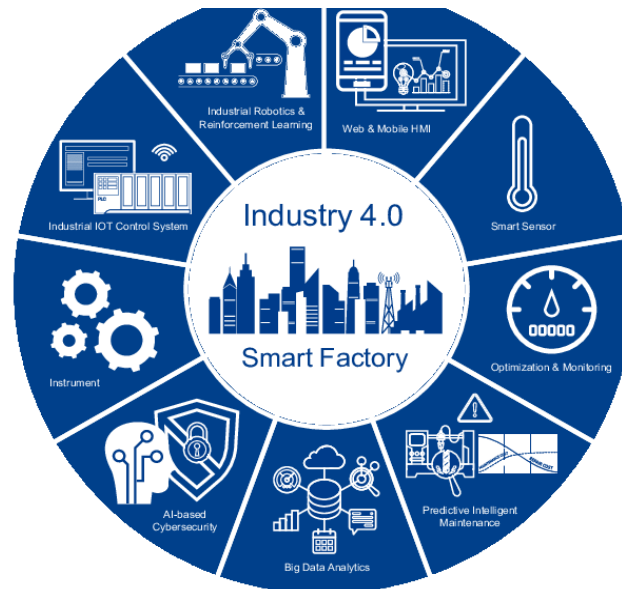
Computerized Maintenance Management Systems (CMMS) help organizations track and manage maintenance and repair activities for their facilities, equipment and other assets in one place.

Asset Performance Management (APM) combines process, operational and machine-level data through dashboards to monitor machine and plant health.

Design & Visualization tools transform raw ideas into intuitive HMI and immersive VR simulations for smarter, faster production.

Power Control drives continuous flow of valuable process and diagnostic data that informs the design environment, visualization systems and information software.

Smart Devices are self and system-aware assets that acquire, process and monitor operating data.



Robotics and Cobots accelerate autonomous / semi-autonomous operations and contribute to systems that are more intelligent, intuitive and flexible.

Production Monitoring provides seamless connectivity to machines on the plant floor, delivering transparent, real-time operational KPIs like Overall Equipment Effectiveness (OEE).

Enterprise Resource Planning (ERP) automates front- and back-office process management and related functions.

Supply Chain Planning (SCP) combines data from multiple departments to sync demand and supply forecasting to improve inventory accuracy and production management.

Quality Management Systems (QMS) standardize and automate quality documentation, processes and measurements.
















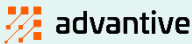











Production Logistics delivers an orchestrated, agile, zero touch material flow through manufacturing operations with autonomous mobile robots (AMRs).

Analytics use data to solve manufacturing bottlenecks, optimize output and quality and provide new insights, tapping into the power of Industrial AI.

For acquisition or investment, companies need to clearly determine what their differentiators are in the Smart Factory ecosystem

Select Engineering/Manufacturing/IIoT Acquisitions

Acquisitions Are Primarily Being Made to Broaden Portfolios

Investor/Parent	Acquirer	Target	Date	Target Description	Comments and Observations
Battery	 TECH SOFT ³	 ACTIFY	May 24	<ul style="list-style-type: none"> 3D visualization and markup software 	<ul style="list-style-type: none"> Moves TechSoft3D into non-SDK, end-user products
Panasonic		 One Network Enterprises	Mar 24	<ul style="list-style-type: none"> Autonomous supply chain management solution 	<ul style="list-style-type: none"> Provides significant customer base for cross-sell
			Feb 24	<ul style="list-style-type: none"> Planning and scheduling algorithms 	<ul style="list-style-type: none"> Provides additional supply chain planning functionality
		 Optessa Intelligent Planning & Scheduling	Feb 24	<ul style="list-style-type: none"> Planning, scheduling, and sequencing software 	<ul style="list-style-type: none"> Provides significant inroad into the automotive market.
			Jan 24	<ul style="list-style-type: none"> Cloud-based EDMS solution 	<ul style="list-style-type: none"> Expands EDMS offerings and opens up new geographics territories (e.g., Australia)
Pacific Lake		 labelcalc a datacor company	Nov 23	<ul style="list-style-type: none"> Software to create FDA-compliant nutrition facts labels 	<ul style="list-style-type: none"> Entry to food industry
		 AFT Applied Flow Technology	Nov 23	<ul style="list-style-type: none"> Pipe flow simulation software for process manufacturing 	<ul style="list-style-type: none"> Addition to engineering simulation software portfolio - follows prior acquisitions of Chemstations, Infonetics and TrackAbout
			Sept 23	<ul style="list-style-type: none"> PLM and MES solutions 	<ul style="list-style-type: none"> Product line addition and cross-sell
			Feb 23	<ul style="list-style-type: none"> Software platform that connects frontline manufacturing workers 	<ul style="list-style-type: none"> Market expansion
			Feb 22	<ul style="list-style-type: none"> Manufacturing Execution System (MES) 	<ul style="list-style-type: none"> Expands Autodesk manufacturing footprint
			Feb 22	<ul style="list-style-type: none"> Quality Health, Safety Environmental and compliance (QHSE) software solutions. 	<ul style="list-style-type: none"> Bridges gap between quality data creation(e.g., metrology) and utilization.
			Oct 21	<ul style="list-style-type: none"> Manufacturing Execution System (MES) 	<ul style="list-style-type: none"> Provides horizontal functionality which complements Infor's ERP solutions

Select Engineering/Manufacturing/IIoT Investor Transactions

Investors Continue to Like Manufacturing Software and Immediately Adjacent Areas



Lead Investor	Company	Date	Target Description	Deal Type	Amount Raised ⁽ⁱ⁾	Pre-Money Valuation ⁽ⁱ⁾	Amount Raised To-Date ⁽ⁱ⁾
		Aug 24	Manufacturing process analytics platform	Series D	\$50.0	\$700.0	\$177.5
		May 24	Manufacturing design review and issues tracking platform	Series B	\$21.0	n/a	\$40.7
n/a		Dec 23	Custom parts manufacturing solution	Later Stage	\$5.0	n/a	\$51.1
		Aug 23	Robot-driven manufacturing solution with autonomous process control	Series A1	\$1.8	\$7.4	\$4.7
		July 23	Manufacturing operations management solution	Growth	n/a	n/a	n/a
		May 23	Green concrete solution – reduces carbon content	Series A2	\$12.0	\$20.0	\$22.2
		Mar 23	Manufacturing ERP solution	Secondary	n/a	n/a	\$303.3
		Jan 23	Design content and collaboration platform solution	Series A	\$11.8	n/a	\$19.0
		Mar 22	Manufacturing business process management solution	LBO	\$35.0	n/a	\$6.8

Manufacturing Software Market Update

Examples of Private Equity Firms Looking for Growth by Acquisition

Battery

 **TECHSOFT^{3D}**

- Graphics engines
- Geometry translators
- Visualization

 **TA ASSOCIATES**

 **revalize**

- CAD
- CPQ
- PLM

 **TA ASSOCIATES**

 **advantive**

- Specialty manufacturing
- ERP
- Logistics

GI PARTNERS

 **aras**

- PLM
- Requirements
- Program Management

 **STRATTAM
CAPITAL**

 **intellect**

- Low-code workflow automation
- Change Mgmt.
- QMS

 **THOMABRAVO**

 **QAD**

- Document control
- Production planning
- Supplier quality



About Us

How Ascentage Helps

Corporate Development and M&A Advisory

Corporate Development Consulting

- **Strategy** – assess the Company’s overall strategic direction, market trends and momentum
- **Customer/Market** – assess current sales and marketing strategy, including customer targeting, messaging, pricing, channels and overall market penetration strategy
- **Product/Technology** – assure product feature set requirements and product/market fit; evaluate technology roadmap in context of market/competitive positioning and strategic objectives
- **Organization** – assess the strengths/weaknesses of team
- **Partnering** – review current partnering agreements/terms; identify and rank future partnering opportunities, including potential strategic partners, investors or acquirers – best fits, synergies, etc.
- **Financial** – review historic financial performance and financial projections; determine current valuation range, plus major milestones and drivers that will increase Company value.

and

Transaction Advisory

- **M&A** – planning, strategizing, preparation and execution – both sell- and buy-side
- **Equity/Financing**
- **JVs, Alliances and Strategic Partnering**

for

Technology-Based Companies

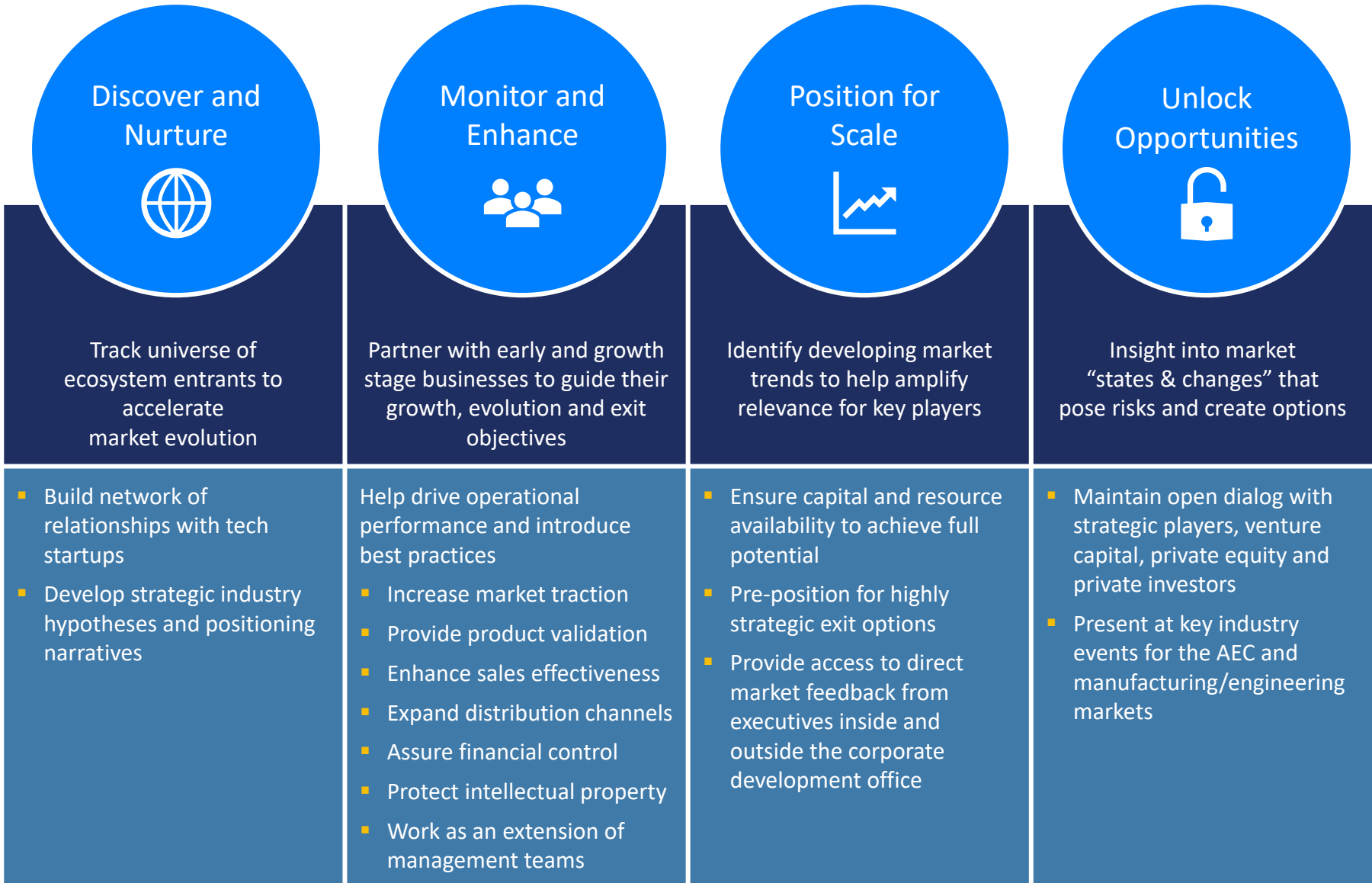
- **Software** – SaaS through to mobility applications
- **Location-based** – GIS and LiDAR
- **Hardware** – robotics, drones and IoT sensors
- **Data** – analytics and artificial intelligence (AI)
- **Solution/consulting/professional services**

focused on

Built Environment/Engineering/Manufacturing

- **Design/Analysis** – CAD, BIM, PLM, CAM, CAE, simulation and design tools for architecture, civil engineering, environmental and manufacturing
- **Build** – vertical and horizontal construction collaboration, estimating, scheduling, workforce and project management software; prefabrication/modular
- **Operate/Maintain** – building controls, facility, energy, environment, safety and asset management
- **Manufacture** – enterprise manufacturing, engineering, quality management and supply-chain software; optimization and analysis solutions







Our Partnering and Market Approach





















Trusted Advisor

20+ Year History of Successful M&A Transactions Supported by Depth of Industry Knowledge

Manufacturing/Engineering

 Sale to  PLM and MES Solutions	 VISUAL KINEMATICS™ <small>Accelerate CAE</small> Sale to  CAE Tool Solutions	 Strategic Investment by  Engineering Visualization Toolkits
 Sale to  Drivetrain Design and Simulation Solutions	 Sale to  PLM for Discrete Manufacturing	 Sale to  Collaborative Robotic Control and Simulation
 Strategic Investment by  Enterprise PLM Solutions	 Sale to  Engineering Software and Services	 Sale to  PDM Software Application

Built Environment

 Strategic Investment by  Sage CRE Solutions Partner	 Strategic Investment by  Field Service/Construction Operations Management	 Sale to  Transportation/Infra Asset Management
 Sale to  Cloud BIM Construction Project Management	 Sale to  3D Modeling Automated Laser Scanning	 Sale to  Right-of-Way Management Software
 Sale to  5D Virtual Construction BIM Software	 Sale to  GIS-Based Asset Management	 Sale to  Point-cloud Processing Software

Sources and Disclosures

Ascentage Advisors, LLC



Sources and Notes

Data Sources

1. Pitchbook
2. LinkedIn
3. Public company releases, filings, and earnings transcripts

Company References

1. Miscellaneous company and press releases

Disclosures

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Helping technology companies evolve

Ascentage Advisors, LLC
36 Maplewood Avenue
Portsmouth, NH 03801 USA
<https://ascentagegroup.com>



Pickwick Capital Partners, LLC
3445 Hamilton Avenue, Suite 1102
White Plains, NY 10601
<https://www.pickwickcapitalpartners.com/form-crs>
<https://brokercheck.finra.org>