



Engineering, Design, PLM & Simulation Software Market Update

H2 2018



Inside the Industry

Industry Wide Trends







- 1 While PLM incumbents continue to focus on heavy equipment, with a small focus shift to electronics, newer PLM companies (e.g., Propel, Upchain, etc.) are primarily focused on emerging manufacturing and field services
- 2 A new cohort of PLM and engineering software leaders is emerging, as illustrated by Propel, Backbone and Upchain
- 3 As simulation and virtual testing become more prevalent, simulation management tools (SMT) and digital thread traceability are bridging design and engineering to supply chains
- 4 Designers and engineers alike are demanding specialized tools to assist with day-to-day workflows; incumbents are fulfilling this solution need through acquisitions
- 5 The "Core 4" (Dassault, PTC, Siemens, and Autodesk) continue to diverge their growth areas: greater horizontal market coverage, IoT, electronic design / digital twin, building information management
- 6 Dassault's acquisition of IQMS is indicative of a renewed interest in manufacturing operations and mid-market customers
- 7 Model Based Systems Engineering (MBSE) is garnering interest from the larger vendors as many customers begin design optimization earlier in the design lifecycle
- 8 Financial sponsors now present a legitimate liquidity alternative for founder-owned and already-PE-backed organizations, eliminating sole reliance on traditional acquirers for liquidity

In Case You Missed These Transactions

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ANSYS acquired Granta Design <i>Engineering materials information management</i>	11
Autodesk acquired BuildingConnected <i>Pre-construction planning solutions</i>	14
Dassault acquired IQMS <i>Mid-market manufacturing ERP / MES</i>	16
Siemens acquired COMSA <i>Automotive design & analysis software</i>	22
Autodesk acquired PlanGrid <i>Digital blueprint solutions</i>	14
PTC acquired Frustum <i>Topology optimization & generative design</i>	21
Bentley acquired Alworx <i>Machine learning & IoT technologies</i>	15
Altium acquired Datawatch <i>Enterprise data preparation & visualization</i>	10
Arena Solutions acquired Omnify <i>Electronics & medical device PLM / QMS</i>	13
Hexagon acquired Bricsys <i>CAD software for the AEC market</i>	19
Altium acquired SIMSOLID <i>Structural analysis simulation software</i>	10
Siemens acquired Mendix <i>Low-code application development platform</i>	22
Altium acquired PCB:NG <i>PCB manufacturing solutions</i>	10
Autodesk acquired Assemble Systems <i>BIM solutions for construction management</i>	14

Emerging Trends

Incumbents Are Beginning to Show Divergent Strategic Priorities

Company	Positioning	Executive Commentary	Strategic Commentary / Areas of Interest
 Altair	Product Design Solutions	<p>"We see a convergence of simulation with the application of machine learning technology to live and historical sensor data as essential to creating better products."</p> <p>- James Scapa, Altair Founder & CEO</p>	<ul style="list-style-type: none"> Integrating data, analytics and simulation solutions to meet multi-industry intelligent design needs Simultaneously seeking to serve the high-performance computing needs their solutions require
 ANSYS	Pervasive Engineering Simulation	<p>"Our vision of making simulation pervasive across the product lifecycle is resonating with customers and partners."</p> <p>- Ajei Gopal, Ansys CEO</p>	<ul style="list-style-type: none"> Focused on building out an end-to-end CAE portfolio, spanning the full-lifecycle of simulation and addressing complexities of specific engineering domains
 AUTODESK	3D Design, Engineering, and Entertainment Software	<p>"We are investing in digitizing and automating construction workflows. Autodesk's goal is to connect construction processes across design, build and operations."</p> <p>- Andrew Anagnost, Autodesk CEO</p>	<ul style="list-style-type: none"> Focused on segmenting product set into BIM, 3D Design, Engineering, and Entertainment applications Investing most heavily in construction / BIM space through acquisitions (+\$1.5 BB deal value in '18)
 DASSAULT SYSTEMES	Industry Solution Experiences	<p>"We are creating '3DEXPERIENCE@WORKS': a new family of business applications based on the 3DEXPERIENCE platform for the mainstream market."</p> <p>- Bernard Charles, Dassault CEO</p>	<ul style="list-style-type: none"> 3DEXPERIENCE platform positions the company around diversification & industry-specific solutions Acquisition of IQMS and 3DEXPERIENCE.WORKS launch indicating strong push into mid-market
 ptc	Industrial Innovation Platform	<p>"With breakthrough new technologies...the CAD industry is going through a renaissance period, and PTC is committed to leading the way."</p> <p>- Jim Heppelmann, PTC President & CEO</p>	<ul style="list-style-type: none"> Re-investing in Creo 3D CAD portfolio through Frustum acquisition and ANSYS partnership Continued investment in ThingWorx IoT ecosystem after Rockwell strategic partnership
 SIEMENS	Digital Transformation of Industry	<p>"Across Siemens' customer base, products and services are becoming ever more connected. Billions of intelligent devices and machines generate massive amounts of data, creating a bridge between real and virtual worlds."</p> <p>- Klaus Helmrich, Siemens Managing Board</p>	<ul style="list-style-type: none"> Digital Factory initiatives center around (i) tying together mechanical & electrical development and (ii) leveraging industrial data in low-code apps through the Mendix acquisition


Emerging Trends

Buyer Universe is Expanding as Credible Sponsors Invest in the Market

PLM	<div><div>arena</div><div>Equity Private Placement</div><div>JMI</div><div>Electronics PLM / QMS / ALM (Undisclosed)</div></div>	<div><div>aras</div><div>Equity Private Placement</div><div>Goldman Sachs</div><div>PLM platform (Undisclosed)</div></div>	<div><div>propel</div><div>Equity Private Placement</div><div>NORWEST</div><div>PLM/PIM/QMS platform (Undisclosed)</div></div>	<div></div> <div>PLM continues to attract investment in a race to build a full lifecycle product collaboration platform that extends from design to service</div>
CAD	<div><div>exocad</div><div>Sale to</div><div>THE CARLYLE GROUP</div><div>Dentistry CAD/CAM (\$129 MM)</div></div>	<div><div>2020</div><div>Sale to</div><div>GOLDEN GATE CAPITAL</div><div>Interior design CAD (\$280 MM)</div></div>	<div><div>Compusoft</div><div>Sale to</div><div>TA ASSOCIATES</div><div>Kitchen / bathroom design (Undisclosed)</div></div>	<div></div> <div>Highly specialized independent CAD systems have reached requisite scale to attract private equity attention</div>
CAE	<div><div>GT Gamma Technologies</div><div>Equity Private Placement</div><div>TA ASSOCIATES</div><div>Multi-physics simulation (Undisclosed)</div></div>	<div><div>Altair</div><div>IPO</div><div>Nasdaq</div><div>Enterprise engineering (\$785 MM - IPO)</div></div>	<div><div>Zemax</div><div>Sale to</div><div>IEQT</div><div>Optical & illumination simulation (Undisclosed)</div></div>	<div></div> <div>Highly specialized engineering vendors challenging incumbents who are broadening scope</div>
CAM	<div><div>AUTOFORM Forming Reality</div><div>Sale To</div><div>astorg</div><div>Sheet metal formation (\$721 MM)</div></div>	<div><div>SIGMA NEST</div><div>Equity Private Placement</div><div>BV Battery Ventures</div><div>Computer aided nesting (Undisclosed)</div></div>	<div></div> <div>Sponsors swayed by consolidation opportunity in fragmented, commoditized CAM space</div>	

Highlight M&A Transactions

Market-Changing Deals You Can't Afford to Have Missed

Counterparty				
Transaction	Acquisition	Acquisition	Acquisition	Acquisition
Target				
Closing Date	Jan 2019	Dec 2018	Nov 2018	Oct 2018
Deal Size	n/a	\$425.0 million	\$70.0 million	\$730.0 million
EV / LTM Revenue	n/a	7.59x (2017)	n/a	n/a
EV / LTM EBITDA	n/a	n/a	n/a	n/a
Commentary	<ul style="list-style-type: none"> In January 2019, ANSYS announced the acquisition of Granta Design, the leading provider of materials information technology, for an undisclosed price Granta, which spun-out of Cambridge University in 1994, has over 180 employees and originally partnered with ANSYS in October 2018 ANSYS intends to leverage Granta's vast database of materials information & intelligence across its portfolio of simulation solutions, allowing customers an improved ability to source, select, and manage materials, particularly for complex additive manufacturing processes 			




- In December 2018, Dassault announced the acquisition of IQMS, the leading ERP / MES platform for mid-market manufacturers, for \$425.0 million (~7.59x 2017 revenue)
- IQMS was previously owned by Technology Crossover Ventures
- Dassault intends to leverage a substantial SOLIDWORKS manufacturer user base in order to penetrate the mid-market with IQMS
- The acquisition marks Dassault's first forays into manufacturing / operations since the Apriso & Quintiq deals in 2013 and 2014

- In November 2018, PTC acquired advanced generative design software company Frustum for approximately \$70.0 million
- At the time of the acquisition, PTC reported Frustum had approximately 17 employees and no material historical revenue
- Frustum's solutions will be incorporated into PTC's Creo portfolio, which marks another significant strategic investment by PTC in their flagship CAD offering, after announcing a strategic partnership with ANSYS at LiveWorx in June 2018

- In October 2018, Siemens acquired low-code application development platform Mendix for ~\$730.0 million (revenue undisclosed)
- Prior to this, Mendix had raised a total of \$38.0 million in VC funding
- As part of the Digital Factory initiative, combining Mendix with the MindSphere IoT ecosystem empowers customers to rapidly leverage manufacturing & operational data into powerful business applications
- Siemens intends to invest in Mendix's low-code application leadership beyond the industry overlap within Siemens' customer base

Highlight Fundraise Transactions

The Next Generation of Product Development Software Has Been Funded

Company		
Transaction	Growth Capital	Growth Capital
Investor	 + 	
Closing Date	August 2018	November 2018
Investment Amount	\$8.0 million	\$18.0 million
Solution Description	<ul style="list-style-type: none">• Backbone PLM increases speed to market, product quality and profits by driving direct-to-consumer product sellers' development collaboration from design through iteration and production• A single cross-functional platform lets geographically-distributed users view activity in real time through a cloud-based hub• Backbone functionally automates the management of inventory, product images, CAD files, size specs, purchase orders, materials, color standards and billing for brands	<ul style="list-style-type: none">• Propel combines Lifecycle Management (PLM), Product Information Management (PIM), and Quality Management System (QMS) functionalities to facilitate whole-design-office collaboration• The company simultaneously announced the release of its version 2.0 PIM solutions whose features help marketing teams create complex SKUs and regional product variations• Further enhancements were announced for the PLM suite's UX and QMS solution's audit and security features
Investor Commentary	<p><i>"Consumer goods companies have been in desperate need of an automated solution and scalable standard for streamlining design, development and production. We quickly recognized Backbone PLM as a necessary and proven productivity tool that shortens lead times and increases profitability for companies."</i></p> <p>- Brandon Tidwell, Signal Peak Ventures Managing Director</p>	<p><i>"The pace of innovation is accelerating, and cloud-first companies like Propel are leading the pack by creating technology that helps companies quickly iterate their product based on industry trends and feedback,"</i></p> <p>- Sean Jacobsohn, Norwest Partner</p>
Executive Commentary	<p><i>"The platform eliminates friction and complexities while increasing speed to market. We are thrilled to partner with such a prestigious group of investors, who will be instrumental in helping us bring our solution to even more innovative brands seeking to meet the on-demand needs of consumers,"</i></p> <p>- Andrew Klein, Backbone COO</p>	<p><i>"Our goal at Propel is to equip any company with the tools to work at the speed of startups. Now that we're seeing the Goliaths become more nimble than the Davids, it's important for all companies to rethink how they approach product development. Propel integrates the whole product development cycle from concept to customer."</i></p> <p>- Ray Hein, Propel Founder & CEO</p>

Market Dynamics

Inclusion Criteria

Madison Park Group (MPG) actively tracks the design, engineering, manufacturing and PLM software landscape. We have seen the convergence of PLM/CAD, simulation and engineering and believe that it is increasingly difficult to differentiate vendors as pure-play design or engineering vendors. The categories MPG tracks include:

- ✓ Design collaboration
- ✓ Infrastructure mapping
- ✓ Geospatial display
- ✓ Information feed modelling
- ✓ Metrology and manufacturing
- ✓ Model-based systems engineering
- ✓ Collaborative design
- ✓ Data management & archiving
- ✓ Product portfolio mgmt
- ✓ Full-systems engineering
- ✓ Design rule analysis / verification
- ✓ Maintenance, Repair & Operations
- ✓ Manufacturing execution
- ✓ 3D commercial applications
- ✓ Manufacturing process mgmt
- ✓ Product exportability
- ✓ Flow dynamics modelling
- ✓ Requirements management
- ✓ Safety procedure development
- ✓ Advanced process control
- ✓ Process simulation and control
- ✓ Printed circuit board editing
- ✓ Electronic circuit simulation
- ✓ Quality management systems

Companies Profiled



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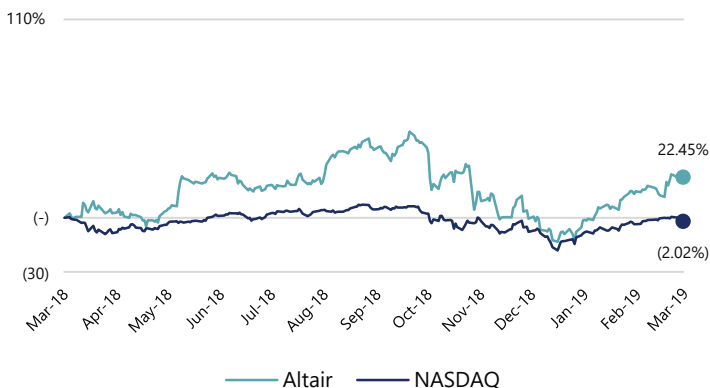
Market Participants

Business Overview

(\$ in millions)

Enterprise Value (EV):	\$2,542
LTM Revenue:	\$396
LTM EBITDA:	\$40
EV / LTM Revenue:	6.41x
EV / LTM EBITDA:	n/m
Net Debt (Cash):	\$4
Dry Powder ⁽¹⁾ :	\$709
Acquisitions Since 2010:	18 (4 since 2017 IPO)
Ownership Status:	Public (NasdaqGS:ALTR)
Headquarters:	Troy, MI

Trailing 12 Month Performance



Enhanced Data Manipulation & Simulation Capabilities

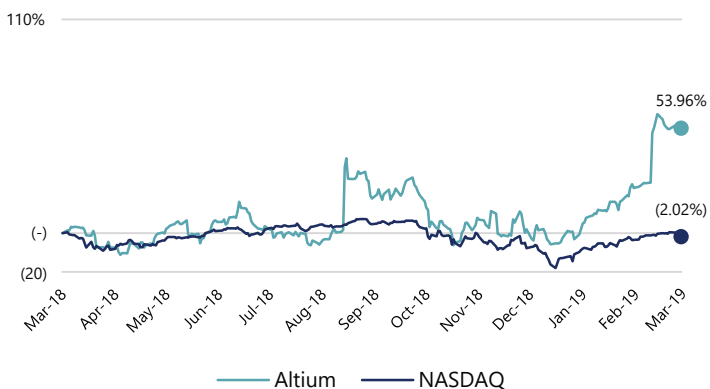
- Altair acquired Datawatch (data intelligence, preparation, visualization and predictive analytics tools; Nov 2018)
 - Datawatch was founded in 1985 and is headquartered in Bedford, MA with approximately 192 employees
 - The company was acquired for a fully diluted equity value of \$176.0 million (4.22x LTM revenue)
 - Datawatch's solutions for real-time & high-volume data visualization will be beneficial in allowing Altair to offer greater functionality and product breadth for visualizing IoT/digital twins data
 - Altair simultaneously gains an opportunity to sell Datawatch products into Altair's existing manufacturing customer base
 - "Bringing Datawatch into Altair should result in a powerful offering consistent with our vision to transform product design and decision making by applying simulation, data science and optimization throughout product lifecycles. We see a convergence of simulation with the application of machine learning technology to live and historical sensor data as essential to creating better products, marketing them efficiently, and optimizing their in-service performance."
 - James Scapa, Altair CEO
- Altair acquired SIMSOLID (structural analysis & simulation software; Oct 2018)
 - SIMSOLID was founded in 2015 and is headquartered in Ontario, Canada
 - The company was acquired for \$22.1 million
 - SIMSOLID provides structural analysis software that does not require significant geometry cleanup or finite element meshing
 - ✓ SIMSOLID can analyze large assemblies and complex parts that cannot be analyzed on a desktop computer with traditional FEA techniques and will further be beneficial in the simulation of additively manufactured parts
 - ✓ The acquisition will also advance Altair's goal of bringing analysis and simulation to a broader range of users; Ansys has displayed similar ambitions

Business Overview

(\$ in millions)

Enterprise Value (EV):	\$2,985
LTM Revenue:	\$155
LTM EBITDA:	\$61
EV / LTM Revenue:	19.22x
EV / LTM EBITDA:	n/m
Net Debt (Cash):	\$58
Dry Powder ⁽¹⁾ :	\$970
Acquisitions Since 2010:	11
Ownership Status:	Public (ASX:ALU)
Headquarters:	La Jolla, CA

Trailing 12 Month Performance



Vision for PCB Market Leadership

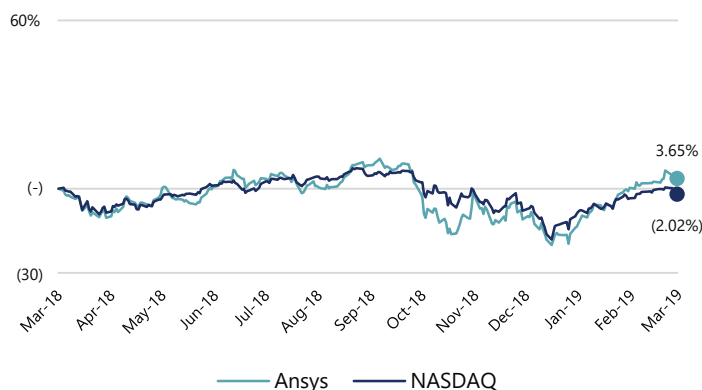
- Altium acquired PCB:NG (software-optimized electronics manufacturing practice; Jul 2018)
 - PCB:NG was founded in 2015 and is headquartered in Brooklyn, NY
 - The company was acquired for fair value consideration of \$4.8 million
 - PCB:NG is a start-up focused on the smart manufacturing of printed circuit boards, and will contribute to the development of the Altium product realization platform (focuses on connecting the design function directly to the manufacturing floor)
- Altium launches new cloud infrastructure at AltiumLive 2018: Annual PCB Design Summit
 - The new cloud-based platform, Altium 365, was targeting a December 2018 launch
 - Direct integrations will exist between the Altium 365 platform and the current Altium Designer offering that provides designers an immediate feedback loop from suppliers and manufacturers on product design feasibility and corresponding improvements
 - Stakeholders include designers, component distributors, and the distributed manufacturing chain
 - "This is an important - but only first - step towards delivering on our vision for helping to transform the electronics industry. Altium 365 will ultimately provide direct, real-time connectivity between design, supply chain, and the people and equipment on the manufacturing floor to achieve this."
 - Ted Pawela, Altium Chief Operating Officer

Business Overview

(\$ in millions)

Enterprise Value (EV):	\$14,091
LTM Revenue:	\$1,294
LTM EBITDA:	\$539
EV / LTM Revenue:	10.89x
EV / LTM EBITDA:	26.1x
Net Debt (Cash):	\$777
Dry Powder ⁽¹⁾ :	\$6,448
Acquisitions Since 2010:	16
Ownership Status:	Public (NasdaqGS: ANSS)
Headquarters:	Canonburg, PA

Trailing 12 Month Performance



Continued Focus on Specialized Engineering Solutions Portfolio

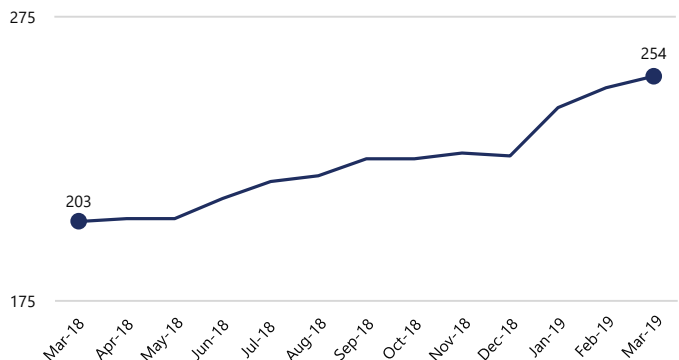
- ANSYS acquired Granta Design (materials information management system; Jan 2019)
 - Granta Design was founded in 1994 and is headquartered in Cambridge, United Kingdom with approximately 171 employees
 - The company was acquired for an undisclosed amount
 - Prior to the acquisition, ANSYS and Granta announced a strategic partnership in October 2018 whereby Granta's materials database was directly integrated into ANSYS Workbench for more effective management of materials for additive manufacturing
 - "With materials engineering becoming an increasingly important aspect of product development, our customers require high-quality and comprehensive materials information for accurate simulation results. Integrating Granta's solutions into the ANSYS portfolio will provide a seamless user experience – and enable our customers to innovate like never before."
 - Shane Emswiler, ANSYS Vice President & General Manager
- ANSYS acquired Helic (systems on chips (SoC) simulation offerings; Jan 2019)
 - Helic was founded in 2000 and is headquartered in Santa Clara, CA
 - The company was acquired for an undisclosed amount
 - "Electromagnetic noise is a key design challenge that is driving the need for extensive on-chip electromagnetic analysis. As the leader in multi-physics simulation, ANSYS already has the leading electromagnetic and semiconductor solutions on the market. This acquisition brings Helic's, industry leading on-chip electromagnetic solutions into the ANSYS family – complementing our leadership in power integrity noise analysis and helping our customers address the market needs driven by 5G, AI and cloud computing."
 - John Lee, ANSYS Vice President and General Manager
- Launch of the ANSYS Cloud enables the use of ANSYS simulation solutions through a cloud-based high performance computing (HPC) environment
 - Companies such as Rescale allow access to a broad range of products in an HPC environment
 - Ansys is the first of the "Core 5" vendors to provide their own HPC environment

Business Overview

(\$ in millions)

Enterprise Value (EV):	n/a
LTM Revenue:	n/a
LTM EBITDA:	n/a
EV / LTM Revenue:	n/a
EV / LTM EBITDA:	n/a
Net Debt (Cash):	n/a
Dry Powder:	n/a
Acquisitions Since 2010:	2
Ownership Status:	PE-Backed (Goldman Sachs, SilverLake)
Headquarters:	Andover, MA

Trailing 12 Month Employee Growth



Investing in the Open PLM Platform

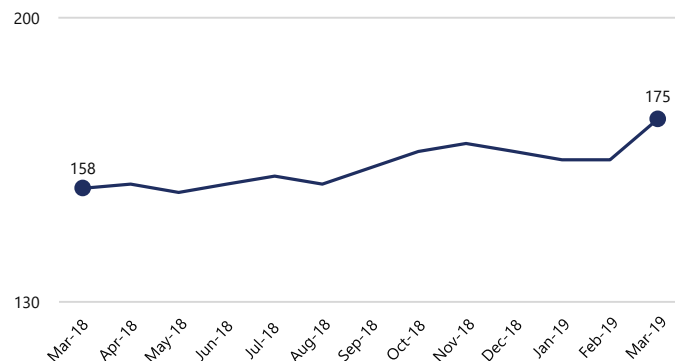
- Aras received \$70.0 million of investment from Goldman Sachs Private Capital in September 2018, with participation from existing investor, Silver Lake Kraftwerk
 - The growth capital will support Aras' global operations expansion and its open PLM platform growth through in-house development
 - "Globally, industrial businesses are wrestling with the transition to the digital era, whether refreshing mission-critical enterprise applications or positioning themselves for new opportunities. Aras' innovative software platform enables them to execute digital transformation projects."
 - Hillel Moerman, Goldman Sachs Private Capital Investing Head
- Aras acquired Comet Solutions (family of web-deployed simulation offerings; Sep 2018)
 - Comet Solutions was founded in 2001 and is headquartered in Albuquerque, NM with approximately 16 employees
 - The company was acquired for an undisclosed amount
 - "Extending the Digital Thread to include simulation tools and processes has emerged as a critical enabler for future business models. Simulation can add significant value to product development, manufacturing and field operations, but has not yet reached its potential due to limited connection to the rest of the enterprise. The addition of Comet's capabilities will allow us to bring repeatability, reusability and traceability to simulation across the product lifecycle."
 - Rob McAveney, Aras Chief Architect
- Prior to the September 2018 investment, Aras received \$40.0 million of investment led by Silver Lake Kraftwerk with participation from GE Ventures
 - Aras leveraged a portion of this capital to acquire Impresa (MRO for in-service assets) and Comet Solutions (simulation management)
 - The Company expanded its global operations by adding offices in the United Kingdom and Italy

Business Overview

(\$ in millions)

Enterprise Value (EV):	n/a
LTM Revenue:	n/a
LTM EBITDA:	n/a
EV / LTM Revenue:	n/a
EV / LTM EBITDA:	n/a
Net Debt (Cash):	n/a
Dry Powder:	n/a
Acquisitions Since 2010:	1
Ownership Status:	PE-Backed (JMI Equity)
Headquarters:	Forster City, CA

Trailing 12 Month Employee Growth



Leadership in High Tech / Electronics-focused PLM

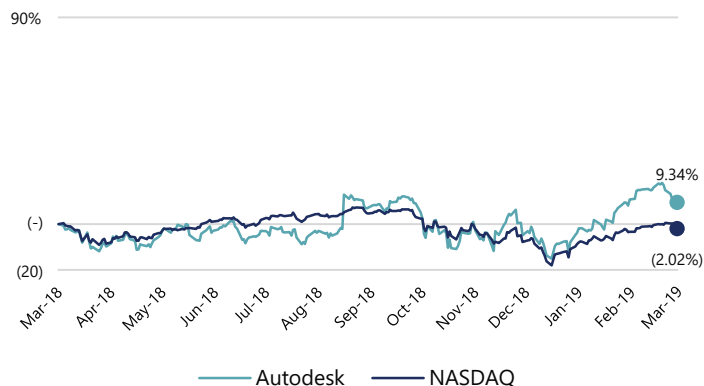
- Arena Solutions acquired Omnify Software (electronics & medical device PLM / QMS offerings; Oct 2018)^(a)
 - Omnify Software was founded in 2002 and is headquartered in Andover, MA with approximately 14 employees
 - The company was acquired for an undisclosed amount
 - The acquisition solidifies Arena's position as the leader in the SMB market for electronic manufacturers and medical devices, as Omnify was one of Arena's main competitors in the SMB PLM market
- Arena Solutions releases its new Requirements Management solution (Jul 2018)
 - Allows design teams to collaborate on new product requirements and issues
 - Workflows include the documentation, analyzing, tracing, prioritization, and change control of new product development (NPD) and new product introduction (NPI) processes
 - "Our customers can now employ the valuable product lifecycle management discipline with a single source of the product record back to the earliest concept and requirements management phases to improve transparency and control between all impacted stakeholders."
 - Craig Livingston, Arena Solutions CEO
- On the back of JMI's 2017 investment, and in response to rapid growth and success in the Internet of Things (IoT) and medical device markets, Arena has opened offices in Austin, TX and Suzhou, China

Business Overview

(\$ in millions)

Enterprise Value (EV):	\$34,503
LTM Revenue:	\$2,570
LTM EBITDA:	\$113
EV / LTM Revenue:	13.43x
EV / LTM EBITDA:	n/m
Net Debt (Cash):	(\$1,134)
Dry Powder ⁽¹⁾ :	\$6,103
Acquisitions Since 2010:	63
Ownership Status:	Public (NasdaqGS: ADSK)
Headquarters:	San Rafael, CA

Trailing 12 Month Performance



End-to-End AEC Planning & Collaboration

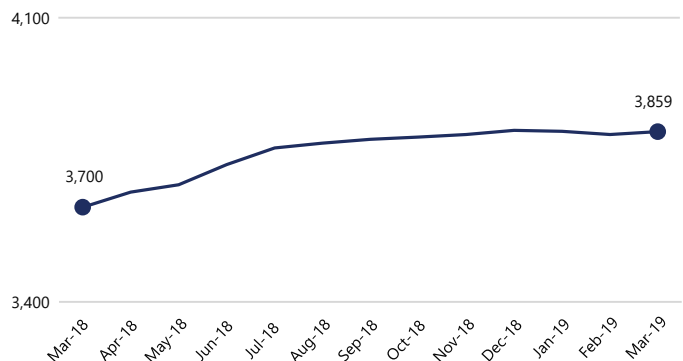
- Autodesk acquired BuildingConnected (pre-construction planning solutions; Dec 2018)
 - BuildingConnected was founded in 2012 and is headquartered in San Francisco, CA with approximately 190 employees
 - The company was acquired for \$275.0 million
 - This acquisition moves the company more into preconstruction planning, the stage where contractors determine which suppliers and subcontractors to use, effectively building a cast list of involved construction parties
 - "Our tools empower all stakeholders with greater visibility and better information to make immediate decisions. We're excited about creating a robust digital marketplace for the global construction industry, helping to boost productivity, while lowering cost and risk."
 - Jim Lynch, Autodesk Construction Solutions Vice President & General Manager
- Autodesk acquired PlanGrid (digital blueprint solutions; Nov 2018)
 - PlanGrid was founded in 2011 and is headquartered in San Francisco, CA with approximately 430 employees
 - The company was acquired for \$875.0 million (8.75x expected 2020 subscription revenue)
 - Provides digital blueprints and on-site reporting applications
 - "There is a huge opportunity to streamline all aspects of construction through digitization and automation. The acquisition of PlanGrid will accelerate our efforts to improve construction workflows for every stakeholder in the construction process."
 - Andrew Anagnost, Autodesk CEO
- Based on public statements by Andrew Anagnost, Autodesk CEO, the company believes it now has all the assets needed to maintain BIM leadership

Business Overview

(\$ in millions)

Enterprise Value (EV):	n/a
LTM Revenue:	n/a
LTM EBITDA:	n/a
EV / LTM Revenue:	n/a
EV / LTM EBITDA:	n/a
Net Debt (Cash):	n/a
Dry Powder:	n/a
Acquisitions Since 2010:	26
Ownership Status:	Private
Headquarters:	Exton, PA

Trailing 12 Month Employee Growth



Expanding Public Infrastructure Planning

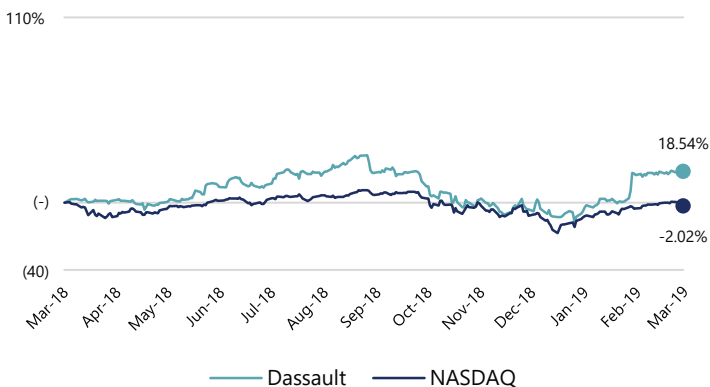
- Bentley acquired ACE Enterprise (system interoperability solutions; Nov 2018)
 - ACE Enterprise was founded in 1994 and is headquartered in Bratislava, Slovakia with approximately eight employees
 - The company was acquired for an undisclosed amount
 - Provides technology solutions that interface with enterprise resource planning (ERP), enterprise asset management (EAM), and geographical information systems (GIS)
- Bentley acquired AIWorx's (machine learning and IoT technologies; Nov 2018)
 - AIWorx was founded in 2011 and is headquartered in Quebec, Canada with approximately 10 employees
 - The company was acquired for an undisclosed amount
 - "The biggest opportunities we've worked on have to do with improving infrastructure asset performance on an industrial scale, by way of the data from connected machines, instrumentation, sensors, and communications systems... by incorporating our tools into Bentley's services for digital twins, we enable infrastructure operators to multiply the potential benefits of machine learning and IoT."
 - Andre Villemair, Alworx Co-Founder & President
- Bentley acquired Agency9 (digital twin capabilities for cities; Oct 2018)
 - Agency9 was founded in 2003 and is headquartered in Stockholm, Sweden with approximately nine employees
 - The company was acquired for an undisclosed amount
- Bentley acquired LEGION (pedestrian simulation software; Oct 2018)
 - Legion was founded in 1997 and is headquartered in London, United Kingdom with approximately 13 employees
 - The company was acquired for an undisclosed amount

Business Overview

(\$ in millions)

Enterprise Value (EV):	\$35,721
LTM Revenue:	\$3,982
LTM EBITDA:	\$1,196
EV / LTM Revenue:	8.97x
EV / LTM EBITDA:	29.9x
Net Debt (Cash):	2,072
Dry Powder ⁽¹⁾ :	\$15,610
Acquisitions Since 2010:	35
Ownership Status:	Public (ENXTPA: DSY)
Headquarters:	Velizy-Villacoublay, France

Trailing 12 Month Performance



Extending Solutions Down-Market

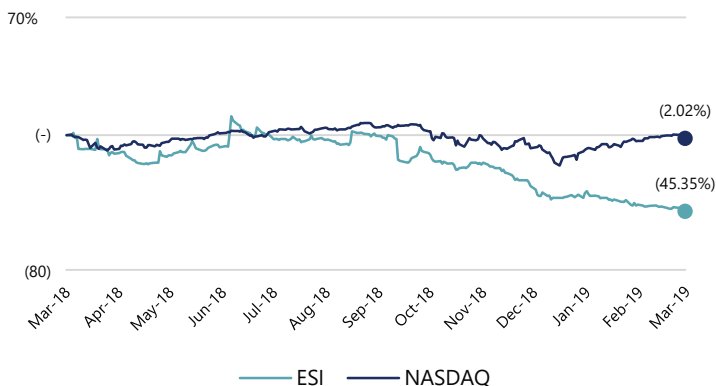
- Dassault announces the launch of its 3DEXPERIENCE.WORKS platform (Feb 2019)
 - Includes a portfolio of SOLIDWORKS-based solutions focused on better serving the needs of SMBs
 - Encourages collaboration between the design, simulation, and manufacturing functions
 - "Small and midsize firms worldwide need digital solutions to grow but have long been challenged to find ones that are right for their size. By introducing 3DEXPERIENCE.WORKS, we bring the platform effect to them."
 - Bernard Charlès, Dassault Systèmes Vice Chairman and CEO
- Dassault acquired IQMS (mid-market manufacturing ERP / MES solutions; Dec 2018)
 - IQMS was founded in 1989 and is headquartered in Paso Robles, CA with approximately 294 employees
 - The company was acquired for \$425.0 million (7.59x 2017 revenue)
 - 2017 revenue of \$56.0 million (30% licenses, 49% recurring, 17% services, 4% hardware)
 - IQMS has historically delivered solutions to mid-market manufacturers that enhance their engineering, manufacturing and business workflows
 - Two-thirds of IQMS customers are SOLIDWORKS customers
 - Approximately twenty-five percent of Dassault's SolidWorks customers are manufacturers
 - The 3DS reseller network provides a large growth avenue to up-sell IQMS solutions to mid-market manufacturers
 - Manufacturing has not been an acquisition focus of Dassault for some time
 - Dassault acquired Quintiq in 2014 (purchased for €260.0 million, or ~\$325.0 million)
 - Dassault acquired Apriso in 2013 (purchased for €179.0 million, or ~\$205.0 million)

Business Overview

(\$ in millions)

Enterprise Value (EV):	\$193
LTM Revenue:	\$158
LTM EBITDA:	\$11
EV / LTM Revenue:	1.22x
EV / LTM EBITDA:	15.1x
Net Debt (Cash):	\$40
Dry Powder ⁽¹⁾ :	\$45
Acquisitions Since 2010:	14
Ownership Status:	Public (ENXTPA: ESI)
Headquarters:	Paris, France

Trailing 12 Month Performance



Extending Simulation Capabilities into Additive Manufacturing

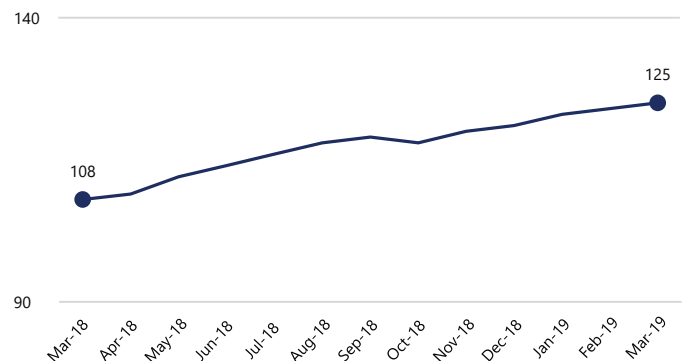
- ESI Group launched its new additive manufacturing simulation solution at Formnext in Frankfurt, Germany (Nov 2018)
 - Ergonomic and accessible simulation module that focuses on metal additive manufacturing
 - "To achieve manufacturing excellence in Additive Manufacturing, engineers must first understand and control the complex relationship between part design, 3D printing processes and material quality. This know-how is essential to engage in process qualification."
 - Dr. Jean Sreng, ESI Business Development Manager
- ESI completed no M&A activity in H2 2018
 - ESI's last transaction was the February 2017 acquisition of Scilab Enterprises (numerical computation platform)

Business Overview

(\$ in millions)

Enterprise Value (EV):	n/a
LTM Revenue:	n/a
LTM EBITDA:	n/a
EV / LTM Revenue:	n/a
EV / LTM EBITDA:	n/a
Net Debt (Cash):	n/a
Dry Powder:	n/a
Acquisitions Since 2010:	1
Ownership Status:	PE-Backed (TA Associates, Cove Hill)
Headquarters:	Westmont, IL

Trailing 12 Month Employee Growth



Fresh Growth Capital

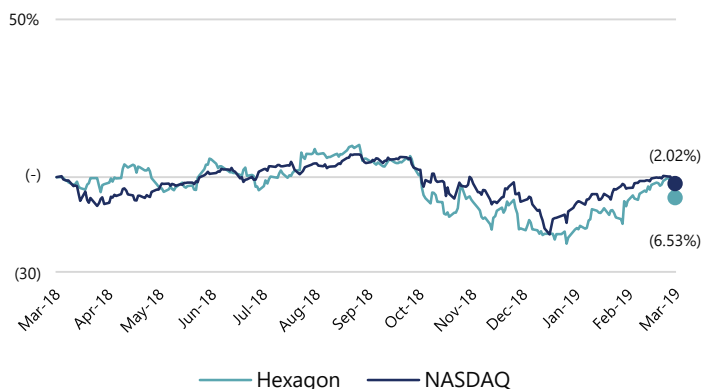
- Cove Hill made a strategic investment in TA Associates-owned Gamma Technologies (investment made in May 2018)
 - Gamma Technologies was founded in 1994 and is headquartered in Westmont, IL
 - Financial terms of the transaction were undisclosed
 - The company provides a family of simulation & design solutions to the automotive sector
 - Specific solutions target the powertrain, transmission, engine, thermal management, hydraulics, lubrication & friction, acoustics, HVAC, after treatment, general multi-body mechanics and control systems within vehicles
 - “In seeking to continue executing on our strategic priorities while simultaneously providing continued product innovation and the highest quality of services to our dedicated customer base, we are thrilled to have the opportunity to partner with Cove Hill Partners, a firm that has a long-term oriented approach in their investment philosophy.”
 - Dr. Thomas Morel, Gamma Technologies President and CEO
- Gamma Technologies acquired EC Power’s AutoLion (battery modelling solution; acquired in Feb 2018)
 - EC Power is headquartered in State College, PA
 - The company was acquired for an undisclosed amount
 - AutoLion provides 1D and 3D Li-on battery simulation software for battery suppliers and OEMs
 - ✓ Electrochemical processes
 - ✓ Battery chemistries
 - ✓ Cell design under normal and extreme circumstances
 - “As a result of the research effort that we have invested in the creation of AutoLion, it is today the leading tool among battery researchers and suppliers globally. We feel that now is the right time to take AutoLion to the next level with GT, who are well positioned as a market-leader to introduce it to all OEMs as a part of a whole vehicle simulation.”
 - Prof. Chao-Yang Wang, EC Power Founder and Chairman

Business Overview

(\$ in millions)

Enterprise Value (EV):	\$20,457
LTM Revenue:	\$4,306
LTM EBITDA:	\$1,355
EV / LTM Revenue:	4.75x
EV / LTM EBITDA:	15.1x
Net Debt (Cash):	(\$2,245)
Dry Powder ⁽¹⁾ :	\$8,171
Acquisitions Since 2010:	39
Ownership Status:	Public (OM: HEXA-B)
Headquarters:	Stockholm, Sweden

Trailing 12 Month Performance



Continued Investment into Digitalization

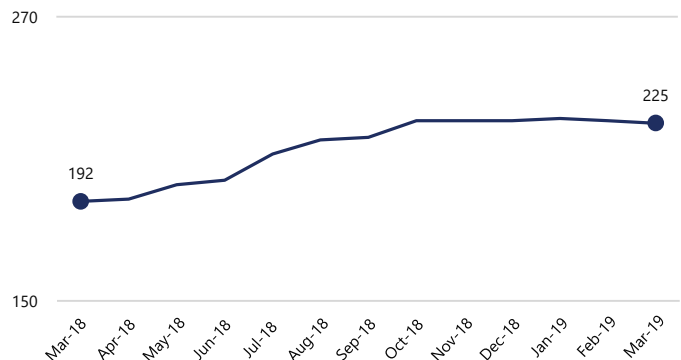
- Hexagon acquired j5 International (operations management software; acquired in Jan 2019)
 - j5 International was founded in 1998 and is headquartered in Douglas, Isle of Man with approximately 58 employees
 - The company was acquired for an undisclosed amount
 - "The operations applications from j5 International significantly enhance the value of our HxGN SDx portfolio which is used to create and manage the ever-evolving digital twin, where both engineering data and documentation are created, maintained, and viewed throughout the facility lifecycle."
 - Ola Rollén, Hexagon President and CEO
- Hexagon acquired Etalon (equipment calibration solutions; acquired in Jan 2019)
 - Etalon was founded in 2004 and is headquartered in Braunschweig, Germany with approximately 5 employees
 - The company was acquired for an undisclosed amount
 - "The technology portfolio in the areas of machine calibration and monitoring, production metrology and Smart Factory ideally complement with the product range of Hexagon."
 - Heinrich Schwenke, Etalon CEO
- Hexagon acquired Bricsys (CAD software for the AEC market; acquired in Oct 2018)
 - Bricsys was founded in 2002 and is headquartered in Ghent, Belgium with approximately 107 employees
 - The company was acquired for an undisclosed amount
 - 2017 revenue was ~\$14.7 million according to the Hexagon transaction press release
 - "Hexagon has long been a leader in structural & process piping design. The Bricsys acquisition extends our domain expertise into building design, adding walls, floors, doors, and other construction related features."
 - Ola Rollén, Hexagon President and CEO

Business Overview

(\$ in millions)

Enterprise Value (EV):	n/a
LTM Revenue:	n/a
LTM EBITDA:	n/a
EV / LTM Revenue:	n/a
EV / LTM EBITDA:	n/a
Net Debt (Cash):	n/a
Dry Powder:	n/a
Acquisitions Since 2010:	n/a
Ownership Status:	PE-Backed (Insight)
Headquarters:	Portland, OR

Trailing 12 Month Employee Growth



Creating A New Category

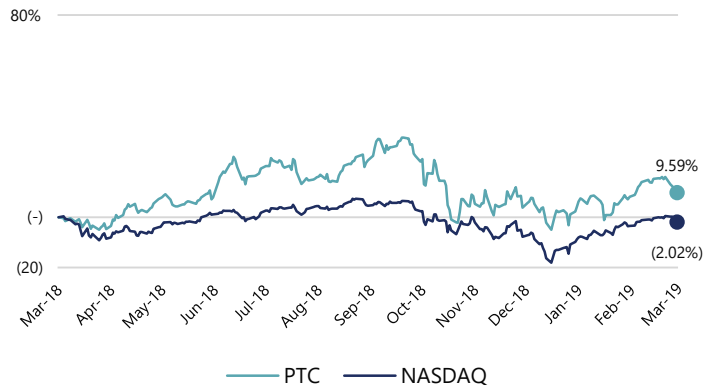
- Jama received \$200.0 million of investment from Insight Venture Partners in June 2018, with participation from Madrona Venture Group
 - The Company is attempting to define a new product category they title Fundamental Predictive Product Development
 - The investment will allow Jama to put greater efforts towards product expansion in this area
 - ✓ Predictive Product Development leverages requirements and design and manufacturing data manufacturing data from previous design, with field service data to better predict future product development
 - ✓ Dissimilar to legacy solutions, Jama's are architected to address requirements as they affect not only the mechanical components of systems, but the electronics and software incorporated as well
 - Jama also plans to leverage the capital to drive global expansion

Business Overview

(\$ in millions)

Enterprise Value (EV):	\$10,967
LTM Revenue:	\$1,270
LTM EBITDA:	\$163
EV / LTM Revenue:	8.64x
EV / LTM EBITDA:	n/m
Net Debt (Cash):	(\$476)
Dry Powder ⁽¹⁾ :	\$2,439
Acquisitions Since 2010:	15
Ownership Status:	Public (NasdaqGS: PTC)
Headquarters:	Needham, MA

Trailing 12 Month Performance



Re-Investing in CAD Following Considerable Investment in IoT Ecosystem

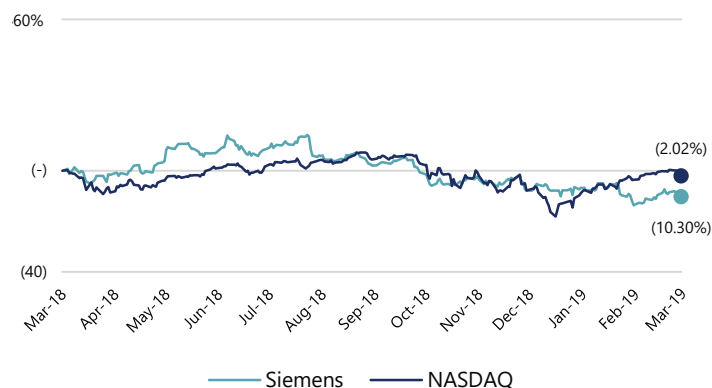
- PTC acquired Frustum (topology optimization & generative design solutions; Nov 2018)
 - Frustum was founded in 2014 and is headquartered in Boulder, CO with approximately six employees
 - The company was acquired for ~\$70.0 million
 - Generative design systems explore all possible design permutations (which include non-geometric information) to quickly identify design alternatives
 - ✓ Current generative design technologies are mature and generative design models can now be created without end-user programming
 - ✓ Artificial intelligence techniques are now being leveraged to let new designs learn from previous ones
- In addition to the Frustum acquisition, PTC & Ansys' partnership announcement at LiveWorx in June 2018 cements that PTC is not abandoning the CAD market
 - PTC will deliver ANSYS' Discovery Live real-time simulation within PTC's Creo 3D CAD software
- Following the strategic partnership with Rockwell Automation in June, in November 2018, PTC officially launched the FactoryTalk InnovationSuite, which bundles Rockwell's FactoryTalk Analytics and MOM platforms, with PTC's ThingWorx Industrial IoT Platform, including Kepware industrial connectivity and Vuforia augmented reality

Business Overview

(\$ in millions)

Enterprise Value (EV):	\$113,837
LTM Revenue:	\$95,417
LTM EBITDA:	\$10,108
EV / LTM Revenue:	1.19x
EV / LTM EBITDA:	11.3x
Net Debt (Cash):	(\$26,563)
Dry Powder ⁽¹⁾ :	\$41,430
Acquisitions Since 2010:	31
Ownership Status:	Public (DB: SIE)
Headquarters:	Munich, Germany

Trailing 12 Month Performance



Honing into Core Competencies & Broadening Scope of Digital Innovation

- Siemens acquired Comsa (automotive design & analysis software; Dec 2018)
 - Comsa was founded in 1984 and is headquartered in Munich, Germany with approximately two employees
 - The company was acquired for an undisclosed amount
 - Comsa provides specialty software for automotive electrical systems design and wire harness engineering, and will become part of the Mentor business unit of Siemens PLM
 - ✓ Wire harnesses are the third highest cost component in a car (behind the engine and chassis), as they are built discretely and can comprise ~50% of the cost of labor for an entire car
- Siemens acquired Mendix (low code application development platform; Oct 2018)
 - Mendix was founded in 2005 and is headquartered in Boston, MA with approximately 518 employees
 - The company was acquired for \$730.0 million (7.00-8.00x LTM revenue^(a))
 - Low code development platforms allow templated app functions to be brought together using a drag-and-drop interface, but typically at the expense of the complexity and custom-aligned suitability found in hard-coded (high-code) applications
 - The acquisition accelerates Siemens' ability to more easily leverage data from instrumented machines as it looks to embrace digital twins
- Siemens acquired Lightwork Design (3D rendering & visualization tools; Sep 2018)
 - Lightwork Design was founded in 1989 and is headquartered in Sheffield, United Kingdom with approximately 16 employees
 - The company was acquired for an undisclosed amount
 - Siemens PLM main focus will be delivering Lightwork Design's advanced photorealistic rendering and visualization tools for AR/VR, model-based engineering, digital mock-up applications
- Siemens acquired OMATIVE (factory optimization systems; Jul 2018)
 - OMATIVE was founded in 1991 and is headquartered in Jerusalem, Israel with approximately two employees
 - The company was acquired for an undisclosed amount

Source(s): LinkedIn, CapIQ, Pitchbook, public filings, corporate website, market data as of 03/08/2019; (a) Forrester reports

(1) Dry powder defined as cash + available debt capacity + available stock; debt capacity defined as greater of 5.0x LTM EBITDA or 150% of recurring revenue less outstanding debt; available stock represents 20% of outstanding market capitalization

Precedent M&A Transactions and Comparable Public Companies

Priority Acquirers & Notable Deals

Altair
Altium
ANSYS
Aras
Arena Solutions
Autodesk
Bentley
Dassault
ESI Group
Gamma Technologies
Hexagon
PTC
Siemens
Other

(\$ in Millions)		Target Overview				Deal Value	Deal Value / LTM		
Announced	Target	Description	LTM		Revenue		EBITDA		
			Revenue	EBITDA					
Altair								Total Disclosed M&A Deal Value: \$241.5 Million	
11/05/2018	Datawatch	Enterprise data preparation & visualization	\$41.7	(\$9.3)	\$176.0	4.22x	n/m		
10/17/2018	SIMSOLID	Structural analysis simulation software	n/a	n/a	\$22.1	n/a	n/a		
05/10/2018	FluiDyna GmbH	Fluid dynamics simulation software	n/a	n/a	n/a	n/a	n/a		
03/29/2018	CANDI Controls	Real-time device control and data management	n/a	n/a	\$2.4	n/a	n/a		
09/28/2017	Runtime	EDA software optimizing application computing	n/a	n/a	\$25.7	n/a	n/a		
09/14/2017	Componeering	Composites analysis and design software	n/a	n/a	n/a	n/a	n/a		
06/20/2017	Carriots	IoT device enablement platform	n/a	n/a	\$7.5	n/a	n/a		
05/24/2017	MODELiS	EDA for circuit modelling & systems design	n/a	n/a	\$2.0	n/a	n/a		
09/14/2016	Solid Iris Technologies	Rendering software for architecture applications	n/a	n/a	n/a	n/a	n/a		
05/10/2016	CEDRAT	Simulation software for mechatronic systems	n/a	n/a	\$5.1	n/a	n/a		
03/23/2016	Awe Communications	Product design software for cellular devices	n/a	n/a	n/a	n/a	n/a		
09/30/2015	Click2Cast	Casting process simulation software	n/a	n/a	\$0.7	n/a	n/a		
04/07/2015	Multiscale Design Systems	Modeling, simulation, and testing software	n/a	n/a	n/a	n/a	n/a		
07/17/2014	Visual Solutions	Commercial simulation software	n/a	n/a	n/a	n/a	n/a		
12/10/2013	EM Software & Systems	Consulting services for electromagnetic analysis	n/a	n/a	n/a	n/a	n/a		
11/08/2012	Synopsis Consulting	Business consulting services for product dev.	n/a	n/a	n/a	n/a	n/a		
01/11/2011	ACUSIM Software	Computation fluid dynamics software	n/a	n/a	n/a	n/a	n/a		
10/28/2010	SimLab Corporation	Auto industry modeling and simulation software	n/a	n/a	n/a	n/a	n/a		
01/07/2007	solidThinking	Integrated rendering engine design software	n/a	n/a	n/a	n/a	n/a		
01/01/2007	Hiqube	Simulation-driven business analytics suite	n/a	n/a	n/a	n/a	n/a		
03/10/2003	PBS Works	Secure workload management for computing	n/a	n/a	n/a	n/a	n/a		
Altium								Total Disclosed M&A Deal Value: \$49.2 Million	
07/31/2018	PCB:NG	PCB manufacturing	n/a	n/a	\$4.8	n/a	n/a		
05/10/2018	FluiDyna	Predictive aerodynamic simulation tools	n/a	n/a	n/a	n/a	n/a		
05/03/2018	CANDI Controls	Data protocol management for edge devices	n/a	n/a	n/a	n/a	n/a		
02/21/2018	TES International	Thermal solutions for complex flow mapping	n/a	n/a	n/a	n/a	n/a		
Total High						21.67x	24.6x		
Total Low						1.14x	13.3x		
Total Average						5.21x	18.7x		
Total Median						4.29x	18.4x		

Priority Acquirers & Notable Deals (Cont'd)

	(\$ in Millions)		Target Overview					
	Announced	Target	Description	LTM		Deal Value	Deal Value / LTM	
				Revenue	EBITDA		Revenue	EBITDA
Altair								
Altium	Altium (Cont'd) Total Disclosed M&A Deal Value: \$49.2 Million							
ANSYS	08/28/2017	Upverter	Online circuit design platform	n/a	n/a	\$5.6	n/a	n/a
	01/17/2017	Premier EDA Solutions	Electronic design automation	n/a	n/a	\$4.0	n/a	n/a
	09/15/2016	Transfer	Electronics design software	n/a	n/a	\$1.8	n/a	n/a
Aras	08/23/2016	Perception Software	Engineering productivity application	n/a	n/a	\$7.9	n/a	n/a
	08/14/2015	Octopart	Electronics parts search	n/a	n/a	\$18.0	n/a	n/a
Arena Solutions	08/14/2015	Ciiva	Electronic component management	n/a	n/a	\$4.0	n/a	n/a
	09/16/2010	Morfik Technology	Cloud application development	n/a	n/a	\$3.1	n/a	n/a
Autodesk	ANSYS Total Disclosed M&A Deal Value: \$2.3 Billion							
Bentley	01/26/2019	Granta Design	Engineering materials information management	n/a	n/a	n/a	n/a	n/a
	03/22/2018	Optis World	Optics engineering & simulation software	n/a	n/a	\$291.0	n/a	n/a
	11/15/2017	3DSIM	Additive manufacturing process software	n/a	n/a	n/a	n/a	n/a
Dassault	07/11/2017	Computational Engineering	Scientific data visualization software	n/a	n/a	\$6.0	n/a	n/a
	03/17/2017	CLK Design Automation	Static timing and power analysis software	n/a	n/a	n/a	n/a	n/a
	11/03/2016	KPIT	Automotive engineering software	n/a	n/a	n/a	n/a	n/a
ESI Group	09/01/2015	Delcross	CEM & RF analysis software	n/a	n/a	n/a	n/a	n/a
	07/01/2015	Gear Design	Semiconductor & electric design solutions	n/a	n/a	\$30.0	n/a	n/a
	02/05/2015	Newmerical	In-flight icing simulation software	n/a	n/a	\$10.9	n/a	n/a
Gamma Technologies	11/03/2014	Parsec Holdings	Technology-driven engineering services	n/a	n/a	\$8.4	n/a	n/a
	05/01/2014	SpaceClaim	3D direct modeling software	\$18.0	n/a	\$84.9	4.72x	n/a
	01/03/2014	Reaction Design	Chemical modeling & simulation software	n/a	n/a	\$19.1	n/a	n/a
Hexagon	05/22/2013	Tedaka Technologies	Telecom transmission & networking	n/a	n/a	\$2.8	n/a	n/a
	04/03/2013	Evolutionary Engineering	Aerospace and mechanical engineering	n/a	n/a	\$4.6	n/a	n/a
	07/01/2012	Esterel Technologies	Embedded software design	\$21.0	n/a	\$58.0	2.76x	n/a
PTC	06/30/2011	Apache Design	Semiconductor design and verification	\$44.0	n/a	\$294.9	6.70x	n/a
	08/01/2008	Ansoft	Electronic design automation software	\$103.4	\$41.7	\$832.0	8.05x	19.9x
	11/27/2007	Emerging Signals	Railway signalling services	n/a	n/a	\$2.2	n/a	n/a
Siemens	Total High						21.67x	24.6x
	Total Low						1.14x	13.3x
Other	Total Average						5.21x	18.7x
	Total Median						4.29x	18.4x

Priority Acquirers & Notable Deals (Cont'd)

	(\$ in Millions)		Target Overview					
	Announced	Target	Description	LTM		Deal Value	Deal Value / LTM	
				Revenue	EBITDA		Revenue	EBITDA
Altair								
Altium	ANSYS (Cont'd) Total Disclosed M&A Deal Value: \$2.3 Billion							
ANSYS	05/01/2006	Fluent	Computational fluid dynamics	n/a	n/a	n/a	n/a	n/a
	02/16/2006	Aavid Thermal Technologies	Thermal management software solutions	n/a	n/a	\$565.0	n/a	n/a
Aras	12/01/2005	Harvard Thermal	Thermal management software solutions	n/a	n/a	n/a	n/a	n/a
	01/05/2005	Century Dynamics	Hydro-dynamics simulation	n/a	n/a	\$10.0	n/a	n/a
Arena Solutions	02/04/2003	CFX Group	Computational fluid dynamics software	\$19.0	n/a	\$21.7	1.14x	n/a
	03/20/2002	IceBreaker	Online informational management software	n/a	n/a	n/a	n/a	n/a
	11/14/2001	Cadoc	CAD & acoustic testing	n/a	n/a	\$3.9	n/a	n/a
	08/31/2000	ICEM CFD	Aeronautics & automobile design	\$6.8	n/a	\$12.4	1.82x	n/a
Autodesk	Aras Corporation Total Disclosed M&A Deal Value: n/a							
Bentley	09/25/2018	Comet Solutions	Process automation for CAE / simulation	n/a	n/a	n/a	n/a	n/a
	01/24/2018	Info Spectrum (Impressa)	MRO management suite	n/a	n/a	n/a	n/a	n/a
Dassault	Arena Solutions Total Disclosed M&A Deal Value: n/a							
ESI Group	10/24/2018	Omnify Software	Electronics & medical device PLM / QMS	n/a	n/a	n/a	n/a	n/a
	Autodesk Total Disclosed M&A Deal Value: \$3.1 Billion							
Gamma Technologies	12/20/2018	BuildingConnected	Preconstruction planning solutions	n/a	n/a	\$275.0	n/a	n/a
	11/20/2018	PlanGrid	Digital blueprint solutions	\$100.0	n/a	\$875.0	8.75x	n/a
Hexagon	07/19/2018	Assemble Systems	BIM solutions for construction management	n/a	n/a	n/a	n/a	n/a
	11/13/2017	BioLite	Carbon credit license permits	n/a	n/a	n/a	n/a	n/a
PTC	11/15/2016	Seebo	IoT development modules	n/a	n/a	n/a	n/a	n/a
	06/01/2016	CadSoft	PCB Design	n/a	n/a	n/a	n/a	n/a
	04/18/2016	Solid Angle	Animation & visual effects rendering	n/a	n/a	n/a	n/a	n/a
	02/25/2016	Monolith	Voxel modeling	n/a	n/a	n/a	n/a	n/a
Siemens	Total High						21.67x	24.6x
	Total Low						1.14x	13.3x
Other	Total Average						5.21x	18.7x
	Total Median						4.29x	18.4x

Priority Acquirers & Notable Deals (Cont'd)

	(\$ in Millions)		Target Overview					
	Announced	Target	Description	LTM		Deal Value	Deal Value / LTM	
				Revenue	EBITDA		Revenue	EBITDA
Altair								
Altium								
ANSYS	01/01/2016	Autodesk Substation Design	AutoCAD software developer	n/a	n/a	n/a	n/a	n/a
Aras	01/01/2016	SDS	AutoCAD software systems	n/a	n/a	n/a	n/a	n/a
	10/29/2015	Configure One	CPQ software	n/a	n/a	n/a	n/a	n/a
	10/15/2015	Indeeo	Apple graphic design applications	n/a	n/a	n/a	n/a	n/a
Arena Solutions	09/24/2015	NetFabb	3D printing software and services	\$18.6	n/a	\$44.5	2.39x	n/a
	08/27/2015	SeeControl	IoT business applications platform	n/a	n/a	n/a	n/a	n/a
	02/09/2015	Tweak Software	PLM software hosting	n/a	n/a	n/a	n/a	n/a
	01/08/2015	Syntheticity	Urban planning data processing	n/a	n/a	n/a	n/a	n/a
Autodesk	12/10/2014	Magestic Systems	3D nesting of composites	\$3.0	n/a	\$10.0	3.33x	n/a
	11/21/2014	Terrible Labs	Mobile and web application development	n/a	n/a	n/a	n/a	n/a
	11/20/2014	TeamUp Technologies	Three dimensional cloud platform	n/a	n/a	\$60.0	n/a	n/a
	11/20/2014	Lagoa	3D rendering platform	n/a	n/a	\$60.0	n/a	n/a
Bentley	10/14/2014	Modio	Character animation software	n/a	n/a	n/a	n/a	n/a
	10/02/2014	Robobat Polska	Structural engineering software	n/a	n/a	n/a	n/a	n/a
Dassault	06/27/2014	Shotgun Software	Animation & creative software	n/a	n/a	\$54.5	n/a	n/a
	06/27/2014	The Living	Building design studio	n/a	n/a	n/a	n/a	n/a
	06/09/2014	Bitsquid	Mobile game engine	n/a	n/a	n/a	n/a	n/a
ESI Group	05/29/2014	Within Technologies	Engineering design optimization	n/a	n/a	\$88.8	n/a	n/a
	05/14/2014	NEi Nastran Solver	Engineering analysis and simulation	n/a	n/a	n/a	n/a	n/a
	04/29/2014	Illesfay Technology	PLM data replication	n/a	n/a	n/a	n/a	n/a
Gamma Technologies	03/19/2014	Creative Market Labs	Digital content design marketplace	n/a	n/a	n/a	n/a	n/a
	02/06/2014	Delcam	Automated multi-vertical CAD/CAM	\$75.6	n/a	\$285.4	3.78x	n/a
	01/06/2014	Schrauwen Bruneel	Electronic circuits design software	n/a	n/a	n/a	n/a	n/a
	01/06/2014	Circuits.io	Application for designing electronic circuits	n/a	n/a	n/a	n/a	n/a
Hexagon	01/01/2014	Majestic Systems	Industrial manufacturing software	n/a	n/a	n/a	n/a	n/a
	12/04/2013	Azalient	Traffic simulation modeling	n/a	n/a	n/a	n/a	n/a
PTC	12/04/2013	Graitec Innovation	Structural building construction CAD	n/a	n/a	\$88.1	n/a	n/a
	11/04/2013	Virtual Shape	Automotive modeling & design	n/a	n/a	n/a	n/a	n/a
Siemens	Total High						21.67x	24.6x
	Total Low						1.14x	13.3x
	Total Average						5.21x	18.7x
Other	Total Median						4.29x	18.4x

Priority Acquirers & Notable Deals (Cont'd)

	(\$ in Millions)		Target Overview				Deal Value	Deal Value / LTM	
	Announced	Target	Description	LTM		Revenue		EBITDA	
				Revenue	EBITDA				
Altair									
Altium									
ANSYS	10/14/2013	for-each	Software focused on mobile development	n/a	n/a	n/a	n/a	n/a	n/a
Aras	08/19/2013	Bestech Systems	Bridge span analysis	n/a	n/a	n/a	n/a	n/a	n/a
	08/19/2013	Savoy Computing	Transportation path analysis	n/a	n/a	n/a	n/a	n/a	n/a
	05/19/2013	Tinkercad	Cloud-based 3D design tools	n/a	n/a	n/a	n/a	n/a	n/a
Arena Solutions	03/19/2013	Firehole Technologies	Composite materials design	n/a	n/a	\$10.0	n/a	n/a	n/a
	01/31/2013	Allpoint	3D data processing	n/a	n/a	n/a	n/a	n/a	n/a
	01/08/2013	PI-VR	Automotive visualization	n/a	n/a	\$49.3	n/a	n/a	n/a
Autodesk	10/04/2012	Qontext	Enterprise social collaboration	n/a	n/a	\$26.0	n/a	n/a	n/a
	10/01/2012	HSMWorks	Computer aided manufacturing	n/a	n/a	n/a	n/a	n/a	n/a
	08/28/2012	Inforbix	Product data searching	n/a	n/a	n/a	n/a	n/a	n/a
Bentley	08/13/2012	Exotic Matter	3D fluid solver and dynamics framework	n/a	n/a	n/a	n/a	n/a	n/a
	07/20/2012	Socialcam	Video data capture	n/a	n/a	\$60.0	n/a	n/a	n/a
	06/08/2012	Vela Systems	Construction field software	n/a	n/a	\$76.0	n/a	n/a	n/a
Dassault	12/22/2011	T-Splines	Surface modeling software	n/a	n/a	n/a	n/a	n/a	n/a
	12/16/2011	Horizontal Systems	BIM platform	n/a	n/a	n/a	n/a	n/a	n/a
	11/06/2011	GRIP Entertainment	Artificial intelligence games	n/a	n/a	n/a	n/a	n/a	n/a
ESI Group	10/21/2011	Micro Application	CAD/CAM for fabrication & construction	n/a	n/a	\$23.0	n/a	n/a	n/a
	08/25/2011	Numenus	High-end visualization	n/a	n/a	n/a	n/a	n/a	n/a
	08/22/2011	Darwin Dimensions	3D character modeling	n/a	n/a	n/a	n/a	n/a	n/a
Gamma Technologies	08/01/2011	Instructables	User-generated DIY content	n/a	n/a	\$30.2	n/a	n/a	n/a
	07/19/2011	Code Mine	Cloud-based image tools and utilities	n/a	n/a	n/a	n/a	n/a	n/a
	05/25/2011	Datastay	PLM software	n/a	n/a	n/a	n/a	n/a	n/a
Hexagon	03/11/2011	Blue Ridge Numerics	Fluid dynamics and simulation	n/a	n/a	\$39.0	n/a	n/a	n/a
	03/01/2011	Scaleform	UI software for consumer electronics	n/a	n/a	\$36.0	n/a	n/a	n/a
	12/20/2010	Sim Ops	3D gaming technology	n/a	n/a	n/a	n/a	n/a	n/a
PTC	07/21/2010	Illuminate Labs	Game lighting technology	n/a	n/a	n/a	n/a	n/a	n/a
	05/01/2010	3am Solutions (Assets)	Project visualization	n/a	n/a	n/a	n/a	n/a	n/a
	12/17/2009	PlanPlatform	2D & 3D engineering software	n/a	n/a	\$25.0	n/a	n/a	n/a
Siemens	Total High						21.67x	24.6x	
Other	Total Low						1.14x	13.3x	
	Total Average						5.21x	18.7x	
	Total Median						4.29x	18.4x	

Priority Acquirers & Notable Deals (Cont'd)

Altair
Altium
ANSYS
Aras
Arena Solutions
Autodesk
Bentley
Dassault
ESI Group
Gamma Technologies
Hexagon
PTC
Siemens
Other

(\$ in Millions)		Target Overview			Deal Value	Deal Value / LTM	
Announced	Target	Description	Revenue	EBITDA		Revenue	EBITDA
Autodesk (Cont'd)				Total Disclosed M&A Deal Value: \$3.1 Billion			
08/26/2009	Boss International	Water analysis & engineering	n/a	n/a	n/a	n/a	n/a
01/20/2009	ALGOR	Mechanical/civil engineering software	n/a	n/a	\$30.4	n/a	n/a
12/22/2008	BIMWorld	BIM solutions	n/a	n/a	n/a	n/a	n/a
12/22/2008	Logimetrix	Design/engineering automation	n/a	n/a	n/a	n/a	n/a
11/18/2008	SoftImage	3D animation	n/a	n/a	\$36.0	n/a	n/a
09/11/2008	Bigvan	Develops Computer Aided Design software	n/a	n/a	n/a	n/a	n/a
09/08/2008	3D Geo	3D urban modeling software	n/a	n/a	n/a	n/a	n/a
08/20/2008	ECS	Digital schematic prototyping	n/a	n/a	n/a	n/a	n/a
07/25/2008	Moldflow	Design-to-manufacture automation	\$61.3	\$10.3	\$267.3	4.36x	n/m
06/26/2008	Square One Research	Architectural software	n/a	n/a	n/a	n/a	n/a
05/07/2008	Kynogon	Interactive application intelligence	n/a	n/a	n/a	n/a	n/a
05/07/2008	Realviz	Digital content creation	n/a	n/a	n/a	n/a	n/a
01/11/2008	Carmel Software	HVAC mechanical engineering software	n/a	n/a	n/a	n/a	n/a
01/07/2008	Hanna Strategies	AutoCAD and AutoDesk software	n/a	n/a	\$13.5	n/a	n/a
10/16/2007	Skymatter	Mudbox 3D modelling software	n/a	n/a	\$19.0	n/a	n/a
10/10/2007	Intelisolve	Hydrology and hydraulic analysis software	n/a	n/a	n/a	n/a	n/a
08/27/2007	PlasoTech	3D simulation application software	n/a	n/a	n/a	n/a	n/a
08/20/2007	Opticore	Graphics communication software	\$12.9	\$7.3	n/a	n/a	n/a
08/09/2007	NavisWorks	Computer-aided design software	\$3.9	\$2.0	\$26.2	6.76x	13.3x
08/01/2007	Cumulate Labs	CAD diagramming software	n/a	n/a	n/a	n/a	n/a
10/01/2006	ImpactXoft	Product development software	n/a	n/a	n/a	n/a	n/a
03/31/2006	Constructware	Construction collaboration	n/a	n/a	\$45.7	n/a	n/a
01/10/2006	Alias Systems	Digital content creation	n/a	n/a	\$197.0	n/a	n/a
10/19/2005	Engineering Intent	Enterprise engineering automation services	n/a	n/a	n/a	n/a	n/a
08/22/2005	Solid Dynamics	Kinematics and dynamics technology	\$1.3	\$0.0	n/a	n/a	n/a
07/06/2005	c-plan	Geographic information systems	n/a	n/a	n/a	n/a	n/a
03/01/2005	Compass Systems	Data management services	n/a	n/a	\$17.2	n/a	n/a
03/04/2004	VIA Development	Engineering automation software	n/a	n/a	n/a	n/a	n/a
Total High						21.67x	24.6x
Total Low						1.14x	13.3x
Total Average						5.21x	18.7x
Total Median						4.29x	18.4x

Priority Acquirers & Notable Deals (Cont'd)

	(\$ in Millions)		Target Overview					
			LTM		Deal Value	Deal Value / LTM		
	Announced	Target	Description	Revenue		EBITDA	Revenue	EBITDA
Altair								
Altium								
ANSYS	02/24/2004	Mechsoft	Automated component creation software	n/a	n/a	n/a	n/a	n/a
Aras	03/04/2003	Linius Technologies	CAD connectivity	n/a	n/a	n/a	n/a	n/a
	12/18/2002	TruEInnovations	File and data management software	n/a	n/a	n/a	n/a	n/a
	08/06/2002	CAiCE Software	Surveying and engineering applications	n/a	n/a	\$10.0	n/a	n/a
Arena Solutions	02/21/2002	Revit Technology	AEC parametric building modeler	n/a	n/a	\$133.0	n/a	n/a
	08/28/2001	Buzzsaw	Construction data management	n/a	n/a	\$15.0	n/a	n/a
	03/31/1997	Softdesk	Integrated AEC software	\$34.5	n/a	\$90.6	2.63x	n/a
	03/27/1987	Cadetron	Solids modeling	n/a	n/a	\$6.0	n/a	n/a
Autodesk	Bentley			Total Disclosed M&A Deal Value: n/a				
Bentley	11/12/2018	ACE enterprise Slovakia	System interoperability solutions	n/a	n/a	n/a	n/a	n/a
	11/12/2018	Alworx	Machine learning & IoT technologies	n/a	n/a	n/a	n/a	n/a
	10/15/2018	Agency9	Advanced digital twin modelling	n/a	n/a	n/a	n/a	n/a
Dassault	10/15/2018	Legion	Pedestrian simulation software	n/a	n/a	n/a	n/a	n/a
	06/20/2018	Synchro Software	4D building information modelling	n/a	n/a	n/a	n/a	n/a
	04/26/2018	Plaxis	Geotechnical software tools	n/a	n/a	n/a	n/a	n/a
ESI Group	04/26/2018	SoilVision Systems	Software database for geotechnical engineers	n/a	n/a	n/a	n/a	n/a
	01/22/2018	S-Cube Futuretech	Structural engineering management tools	n/a	n/a	n/a	n/a	n/a
	10/09/2017	ACTION Modulers	Water Modeling Software Business	n/a	n/a	n/a	n/a	n/a
Gamma Technologies	11/01/2016	Comply Serve	Infrastructure compliance management	n/a	n/a	n/a	n/a	n/a
	09/14/2015	E-On Software	3D system simulation	n/a	n/a	n/a	n/a	n/a
	03/09/2015	EADOC	Construction project management software	n/a	n/a	n/a	n/a	n/a
Hexagon	02/10/2015	Acute3D	High-resolution 3D modelling	n/a	n/a	n/a	n/a	n/a
	01/13/2015	C3 Global	Asset performance improvement applications	n/a	n/a	n/a	n/a	n/a
	09/25/2014	BLUERIDGE Analytics	3D civil / site design software	n/a	n/a	n/a	n/a	n/a
PTC	11/05/2013	Engineering Systems	Structural analysis & design software	n/a	n/a	n/a	n/a	n/a
	11/12/2012	EuResearch	Software for pressure vessels & exchangers	n/a	n/a	n/a	n/a	n/a
Siemens	Total High					21.67x		24.6x
	Total Low					1.14x		13.3x
	Total Average					5.21x		18.7x
Other	Total Median					4.29x		18.4x

Priority Acquirers & Notable Deals (Cont'd)

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Siemens
Other

(\$ in Millions)		Target Overview					
Announced	Target	Description	LTM		Deal Value	Deal Value / LTM	
			Revenue	EBITDA		Revenue	EBITDA
Bentley (Cont'd)			Total Disclosed M&A Deal Value: n/a				
09/18/2012	IVARA Corporation	Asset performance management software	n/a	n/a	n/a	n/a	n/a
05/15/2012	InspectTech Systems	Mobile inspection & asset management solutions	n/a	n/a	n/a	n/a	n/a
03/07/2012	Hannappel Software	CAD software for electrical installations	n/a	n/a	n/a	n/a	n/a
11/08/2011	Pointools	Point cloud conversion applications and plug-ins	n/a	n/a	n/a	n/a	n/a
11/08/2011	Formation Design Systems	3D modelling & analysis software	n/a	n/a	n/a	n/a	n/a
03/02/2011	Engineering Dynamics	Offshore simulation software	n/a	n/a	n/a	n/a	n/a
07/07/2010	BLUERIDGE Analytics	3D civil / site design software	n/a	n/a	n/a	n/a	n/a
02/09/2010	Enterprise Informatics	Document and records management software	n/a	n/a	n/a	n/a	n/a
02/08/2010	Exor Corporation	Infrastructure asset management software	n/a	n/a	n/a	n/a	n/a
10/14/2009	gINT Software	Geoenvironmental and geotechnical software	n/a	n/a	n/a	n/a	n/a
Dassault			Total Disclosed M&A Deal Value: \$6.0 Billion				
12/11/2018	IQMS	Mid-market manufacturing ERP / MES	\$56.0	n/a	\$425.0	7.59x	n/a
06/14/2018	Centric Software	Lifecycyle management software	\$61.0	n/a	n/a	n/a	n/a
10/25/2017	No Magic	Model-based systems for engineering design	n/a	n/a	n/a	n/a	n/a
09/28/2017	Exa Corporation	Simulation software for vehicle manufacturers	\$72.7	\$1.5	\$400.3	5.51x	n/m
06/20/2017	Outscale	Cloud security and operations management	n/a	n/a	n/a	n/a	n/a
06/01/2017	AITAC	Marine and offshore engineering software	n/a	n/a	n/a	n/a	n/a
12/09/2016	Xflow CFD	Dynamic fluid flow simulation	n/a	n/a	n/a	n/a	n/a
07/21/2016	Computer Simulation	Multiphysics simulation	\$51.2	n/a	\$247.3	4.83x	n/a
06/02/2016	Ortems	Production scheduling and dispatching	\$5.4	n/a	n/a	n/a	n/a
04/01/2016	3DPLM Software	Product development and QA	n/a	n/a	n/a	n/a	n/a
04/23/2015	Modelon	Transportation & mobility modeling	n/a	n/a	n/a	n/a	n/a
09/09/2014	Quintiq	Production, logistics, and workforce	\$97.6	n/a	\$322.7	3.31x	n/a
07/10/2014	Simpack	Multi-body industrial simulation	n/a	n/a	n/a	n/a	n/a
04/29/2014	BIOVIA	Data mining and analysis software	\$168.5	\$28.5	\$750.0	4.45x	n/m
01/01/2014	Accelrys	Process discovery & simulation	\$168.5	(\$2.2)	\$750.0	4.45x	n/m
Total High						21.67x	24.6x
Total Low						1.14x	13.3x
Total Average						5.21x	18.7x
Total Median						4.29x	18.4x

Priority Acquirers & Notable Deals (Cont'd)

	(\$ in Millions)		Target Overview					
	Announced	Target	Description	LTM		Deal Value	Deal Value / LTM	
				Revenue	EBITDA		Revenue	EBITDA
Altair								
Altium								
ANSYS								
Aras								
Arena Solutions								
Autodesk								
Bentley								
Dassault								
ESI Group								
Gamma Technologies								
Hexagon								
PTC								
Siemens								
Other								
Total Disclosed M&A Deal Value: \$6.0 Billion								
	12/05/2013	RTT	3D visualization technology	\$111.1	\$9.0	\$274.1	2.47x	n/m
	09/04/2013	Safety Technology	Product durability simulation	n/a	n/a	\$1.0	n/a	n/a
	07/25/2013	SFE	Transportation & mobility modeling	n/a	n/a	n/a	n/a	n/a
	07/02/2013	Apriso	Manufacturing operations execution	n/a	n/a	\$205.0	n/a	n/a
	04/25/2013	Archivideo	3D images & maps	n/a	n/a	n/a	n/a	n/a
	04/25/2013	Fe-Design	Non-parametric optimization	n/a	n/a	n/a	n/a	n/a
	04/18/2013	Simpoe	Plastic injection-molding simulation	n/a	n/a	n/a	n/a	n/a
	01/07/2013	SquareClock	3D space planning	n/a	n/a	n/a	n/a	n/a
	12/21/2012	Tuscany Design Automation	Visualization services for circuit design	n/a	n/a	n/a	n/a	n/a
	12/21/2012	Pinpoint	Semiconductor design collaboration	n/a	n/a	n/a	n/a	n/a
	07/11/2012	Gemcom	Supply chain planning and optimization	\$80.4	n/a	\$354.9	4.41x	n/a
	02/09/2012	Netvibes	Personalized dashboard publishing	n/a	n/a	n/a	n/a	n/a
	10/27/2011	Elsys	Electrical engineering schematics	n/a	n/a	n/a	n/a	n/a
	10/04/2011	Simulayt	Draping simulation technology	n/a	n/a	n/a	n/a	n/a
	04/27/2011	Enginuity PLM	Chemical product development	n/a	n/a	n/a	n/a	n/a
	03/17/2011	Intercim	Supply chain operations management	n/a	n/a	\$36.5	n/a	n/a
	10/01/2010	Inceptra LLC	Product lifecycle management solutions	n/a	n/a	n/a	n/a	n/a
	06/22/2010	Geensoft	Embedded systems development	n/a	n/a	\$6.7	n/a	n/a
	06/08/2010	Exalead	Unified search platform	n/a	n/a	\$164.9	n/a	n/a
	04/01/2010	IBM (PLM)	PLM sales & support operations	n/a	n/a	\$600.0	n/a	n/a
	07/21/2008	Engineous	Process integration & design software	n/a	n/a	\$40.0	n/a	n/a
	01/07/2008	Deneb Robotics	Multi-computer manufacturing CAD	n/a	n/a	\$105.0	n/a	n/a
	09/24/2007	Seemage	Automotive & aerospace ALM	n/a	n/a	n/a	n/a	n/a
	06/12/2007	ICEM	Automotive & industrial visualization	n/a	n/a	\$108.2	n/a	n/a
	05/11/2006	MatrixOne	Collaborative PLM	\$135.5	(\$18.2)	\$410.0	3.03x	n/m
	10/04/2005	Abaqus	Advanced finite element analysis	\$100.0	n/a	\$413.0	4.13x	n/a
	07/25/2005	Virtools	3D application development	\$3.1	n/a	\$14.5	4.63x	n/a
	11/01/2000	Spatial	Data translation and visualization technology	n/a	n/a	n/a	n/a	n/a
Total High							21.67x	24.6x
Total Low							1.14x	13.3x
Total Average							5.21x	18.7x
Total Median							4.29x	18.4x

Priority Acquirers & Notable Deals (Cont'd)

	(\$ in Millions)		Target Overview				Deal Value	Deal Value / LTM	
	Announced	Target	Description	LTM		Revenue		EBITDA	
				Revenue	EBITDA				
Altair									
Altium									
ANSYS	01/01/2000	SRAC	CAD analysis programs	n/a	n/a	\$22.0	n/a	n/a	
	07/29/1997	Solidworks	Mechanical design software	n/a	n/a	\$325.0	n/a	n/a	
Aras									
Arena Solutions	02/27/2017	Scilab Enterprises	Numerical computation platform	n/a	n/a	n/a	n/a	n/a	
	09/12/2016	Correct Checks	Background screening services	n/a	n/a	n/a	n/a	n/a	
	02/08/2016	Mineset	Technilogical data management	n/a	n/a	\$4.7	n/a	n/a	
Autodesk	01/06/2016	ITI	Simulation tools & software	n/a	n/a	\$19.3	n/a	n/a	
	05/13/2015	Amoeba Technologies	Cooling simulation & design optimization	n/a	n/a	n/a	n/a	n/a	
	04/15/2015	Ciespace	Web-based CAE modeling solutions	n/a	n/a	n/a	n/a	n/a	
Bentley	04/01/2015	Picviz Labs	Data mining & cybersecurity services	n/a	n/a	n/a	n/a	n/a	
	03/27/2015	Civitec	Embedded perception system design	n/a	n/a	n/a	n/a	n/a	
	02/12/2014	Cam Mechanical Solutions	Technical assistance services	n/a	n/a	n/a	n/a	n/a	
Dassault	10/24/2013	CyDesign Labs	Modelling systems for engineers	n/a	n/a	n/a	n/a	n/a	
	09/24/2012	OpenCFD	Open source CFD software package	n/a	n/a	\$3.1	n/a	n/a	
	12/13/2011	Efield	Integrated modelling & simulation environments	\$0.5	n/a	n/a	n/a	n/a	
ESI Group	08/16/2011	ICIDO	Virtual reality engineering solutions	n/a	n/a	n/a	n/a	n/a	
	04/26/2011	Comet Technology	Vibro-acoustic simulation software	n/a	n/a	n/a	n/a	n/a	
	12/01/2008	Mindware Engineering	Engineering & customized software services	\$5.6	n/a	\$5.6	1.00x	n/a	
Gamma Technologies	12/01/2008	Vdot	Project management & execution platform	n/a	n/a	n/a	n/a	n/a	
	08/01/2006	ATE Technology International	Contract for difference (CFD) product distributor	n/a	n/a	n/a	n/a	n/a	
	09/18/2002	Vibro-Acoustic Sciences	Digital high-frequency noise simulation software	n/a	n/a	\$3.0	n/a	n/a	
Hexagon	08/17/2001	Liquid Process Performance	Materials & composites simulation software	n/a	n/a	n/a	n/a	n/a	
PTC									
Siemens									
Other									

Priority Acquirers & Notable Deals (Cont'd)

	(\$ in Millions)		Target Overview				Deal Value	Deal Value / LTM	
	Announced	Target	Description	LTM		Revenue		EBITDA	
				Revenue	EBITDA				
Altair									
Altium									
ANSYS	10/23/2018	Bricsys	CAD software for AEC market	n/a	n/a	n/a	n/a	n/a	n/a
Aras	06/19/2018	SPRING Technologies	Machine tool simulation & verification software	n/a	n/a	n/a	n/a	n/a	n/a
	06/02/2018	AutonomouStuff	Supplies parts used within autonomy systems	\$45.0	n/a	n/a	n/a	n/a	n/a
	05/15/2018	Nextsense	Measurement and surface inspection services	\$13.5	n/a	n/a	n/a	n/a	n/a
Arena Solutions	04/23/2018	Licom Systems	Software for wood, metal and stone cutting	n/a	n/a	n/a	n/a	n/a	n/a
	04/05/2018	ProCAM Group	CAD software for the mechanical industries	n/a	n/a	n/a	n/a	n/a	n/a
	03/15/2018	Agtek Development Company	Construction cost estimation software	n/a	n/a	n/a	n/a	n/a	n/a
Autodesk	10/04/2017	Luciad	Geospatial software services	\$24.0	n/a	n/a	n/a	n/a	n/a
	06/05/2017	FASys Industrie	Provider of software services	n/a	n/a	n/a	n/a	n/a	n/a
	05/05/2017	Catavolt	Enterprise mobile application development	n/a	n/a	n/a	n/a	n/a	n/a
Bentley	04/26/2017	MSC Software	Computer aided engineering software	\$230.0	n/a	\$834.0	3.63x	n/a	n/a
	08/31/2016	Apodius	Manufacturer of measurement products	n/a	n/a	n/a	n/a	n/a	n/a
	08/15/2016	Multivista	Provider of visual documentation services	n/a	n/a	n/a	n/a	n/a	n/a
Dassault	06/15/2016	Ingegneria dei Sistemi	Provider of systems engineering services	\$20.0	n/a	n/a	n/a	n/a	n/a
	03/31/2016	AICON 3D Systems	Optical camer 3D measurement systems	\$21.1	\$1.8	n/a	n/a	n/a	n/a
	03/23/2016	Forming Technologies	Developer of manufacturing software	n/a	n/a	n/a	n/a	n/a	n/a
ESI Group	02/16/2016	Sigma Space	Optoelectronic aerospace instrumentation	\$25.0	n/a	n/a	n/a	n/a	n/a
	01/13/2016	SCCS	Provider of survey equipment	\$25.3	\$7.8	n/a	n/a	n/a	n/a
	04/07/2015	Q-Das	Statistical process control (SPC) services	n/a	n/a	n/a	n/a	n/a	n/a
Gamma Technologies	07/21/2014	Vero Software	CAD/CAM software	\$106.2	n/a	n/a	n/a	n/a	n/a
	07/16/2014	Geodata Diffusion	Real time kinematic correction services	\$4.0	\$1.8	n/a	n/a	n/a	n/a
	06/11/2014	North West Geomatics	Digital remote sensing/aerial photography	\$13.5	n/a	n/a	n/a	n/a	n/a
Hexagon	06/02/2014	iLab Sistemias	Planning/optimization for agro-businesses	n/a	n/a	n/a	n/a	n/a	n/a
	06/01/2014	Mintec	Software services for mining industry	n/a	n/a	n/a	n/a	n/a	n/a
	04/30/2014	Arvus Tecnologia	Software services for agro businesses	n/a	n/a	n/a	n/a	n/a	n/a
PTC	03/14/2014	Veripos	Satellite position software/hardware/services	\$44.0	\$15.8	n/a	n/a	n/a	n/a
	03/13/2014	SAFEmine	Traffic safety products and services	\$17.2	n/a	n/a	n/a	n/a	n/a
	02/18/2014	Aibotix	Manufacturer of flying robots	n/a	n/a	n/a	n/a	n/a	n/a
Siemens	Total High							21.67x	24.6x
	Total Low							1.00x	13.3x
	Total Average							5.12x	18.7x
Other	Total Median							4.22x	18.4x
Total Disclosed M&A Deal Value: \$4.7 Billion									

Priority Acquirers & Notable Deals (Cont'd)

	(\$ in Millions)		Target Overview				Deal Value	Deal Value / LTM	
	Announced	Target	Description	LTM		Revenue		EBITDA	
				Revenue	EBITDA				
Altair									
Altium									
ANSYS	12/03/2013	Pixis	Provider of digital engineering services	n/a	n/a	n/a	n/a	n/a	n/a
Aras	10/07/2013	Devex Tecnologia e Sistemas	Mine-management software services	n/a	n/a	n/a	n/a	n/a	n/a
	06/05/2013	Geosoft	Software for cartography/photogrammetry	n/a	n/a	n/a	n/a	n/a	n/a
	05/13/2013	Navgeokom	Surveying and mapping products	n/a	n/a	n/a	n/a	n/a	n/a
Arena Solutions	04/15/2013	Manfra & Companhia	Topography software systems	\$9.2	n/a	n/a	n/a	n/a	n/a
	01/28/2013	LISTECH	Developer of construction software	n/a	n/a	n/a	n/a	n/a	n/a
	01/08/2013	New River Kinematics	3D analysis software for metrology application	\$13.3	n/a	n/a	n/a	n/a	n/a
Autodesk	12/03/2012	GTA Geoinformatik	Provider of 3D city mapping technologies	n/a	n/a	n/a	n/a	n/a	n/a
	01/19/2012	Microsurvey Software	Developer of surveying and mapping software	\$2.6	n/a	n/a	n/a	n/a	n/a
	08/19/2011	Sisgraph	Supplier of engineering and geospatial software	\$14.3	n/a	n/a	n/a	n/a	n/a
Bentley	07/01/2010	Intergraph	Engineering and geospatial software	n/a	n/a	\$2,130.0	n/a	n/a	n/a
	12/10/2009	MYCRONA	Manufacturer of multi-sensor machines	n/a	n/a	n/a	n/a	n/a	n/a
	10/05/2009	Mahr Multisensor	Industrial measuring instruments	n/a	n/a	n/a	n/a	n/a	n/a
Dassault	10/14/2008	Rinex Technology	Yield mapping tools for agro businesses	\$4.5	n/a	n/a	n/a	n/a	n/a
	07/24/2008	Serein Metrology	Manufacturer of precision measuring equipment	\$4.0	n/a	n/a	n/a	n/a	n/a
	06/27/2008	m&h Group	Manufacturer of machine tool probes	\$13.3	n/a	n/a	n/a	n/a	n/a
ESI Group	06/24/2008	Messtechnik Wetzlar	Software for quality control of mechanical parts	\$3.3	n/a	n/a	n/a	n/a	n/a
	06/23/2008	Viewserve	Web based fleet management system	\$1.1	n/a	n/a	n/a	n/a	n/a
	06/09/2008	Advanced Metrology Solutions	Distributor of precision metrology products	\$4.5	n/a	n/a	n/a	n/a	n/a
Gamma Technologies	02/26/2008	Santiago & Cintra	Positioning applications for construction/agro	\$20.7	n/a	n/a	n/a	n/a	n/a
	02/07/2008	Haselbach Surveying Instruments	Distributor and seller of surveying equipment	\$750.0	n/a	n/a	n/a	n/a	n/a
	02/07/2008	Surveyors Service Company	Distributor of surveying equipment	n/a	n/a	n/a	n/a	n/a	n/a
Hexagon	12/01/2007	Leica Geosystems Hungary	Surveying and construction equipment	n/a	n/a	n/a	n/a	n/a	n/a
	11/28/2007	NovAtel	Satellite system components	\$76.0	\$17.8	\$438.9	5.78x	24.6x	
	11/21/2007	Junglas	Construction and machine control equipment	n/a	n/a	n/a	n/a	n/a	n/a
PTC	11/21/2007	Rudolf & August Rost Vertriebs	Surveying and construction equipment	n/a	n/a	n/a	n/a	n/a	n/a
	11/19/2007	Elcome Technologies	GPS and navigation surveying services	\$14.8	n/a	n/a	n/a	n/a	n/a
	09/04/2007	CogniTens	3D non-contact measurement systems	\$8.0	n/a	\$20.0	2.50x	n/a	
Siemens	Total High							21.67x	24.6x
	Total Low							1.00x	13.3x
	Total Average							5.12x	18.7x
Other	Total Median							4.22x	18.4x
Hexagon (Cont'd) Total Disclosed M&A Deal Value: \$4.7 Billion									

Priority Acquirers & Notable Deals (Cont'd)

	(\$ in Millions)		Target Overview				Deal Value	Deal Value / LTM	
	Announced	Target	Description	LTM		Revenue		EBITDA	
				Revenue	EBITDA				
Altair									
Altium									
ANSYS	07/24/2007	Jingjiang Measuring Tools	Manufacturer of linear measuring tools	\$10.9	n/a	n/a	n/a	n/a	n/a
Aras	06/19/2007	IONIC Software	Software for geospatial information systems	\$12.6	n/a	n/a	n/a	n/a	n/a
	05/22/2007	Transmetal	Distributor of metrology products	\$5.4	n/a	n/a	n/a	n/a	n/a
	05/18/2007	Jigsaw Technologies	GPS-based machine automation software	\$9.0	n/a	n/a	n/a	n/a	n/a
Arena Solutions	05/16/2007	GAMFI International	Construction laser tools and instruments	\$1.5	n/a	n/a	n/a	n/a	n/a
	05/09/2007	D&P Systems	Developer of multidimensional systems	n/a	n/a	n/a	n/a	n/a	n/a
	05/01/2007	Allen Precision Equipment	Surveying and construction products	\$24.0	n/a	n/a	n/a	n/a	n/a
Autodesk	04/13/2007	Topolaser System	Distributor of survey equipment	n/a	n/a	n/a	n/a	n/a	n/a
	04/01/2007	Acquis	Data editing and management software	\$3.0	n/a	n/a	n/a	n/a	n/a
	01/15/2007	Svensk ByggnadsGeodesi	Software systems for measuring and planning	\$6.8	\$0.8	n/a	n/a	n/a	n/a
Bentley	01/01/2007	Willi Geßwein	Manufacturer of surveying instruments	\$1.3	n/a	n/a	n/a	n/a	n/a
	10/01/2005	Leica Geosystems	Surveying and mapping equipment	n/a	n/a	\$1,140.0	n/a	n/a	n/a
	05/01/2002	Newport	Metrological tools and technology	n/a	n/a	n/a	n/a	n/a	n/a
Dassault	05/03/2001	Brown & Sharpe	Manufacturer of metrological tools	n/a	n/a	\$170.0	n/a	n/a	n/a
	PTC								Total Disclosed M&A Deal Value: \$2.1 Billion
ESI Group	11/19/2018	Frustum	Topology optimization & generative design	n/a	n/a	\$69.6	n/a	n/a	n/a
	02/16/2018	Waypoint Labs	Augmented reality for frontline workers	\$20.0	n/a	n/a	n/a	n/a	n/a
	01/12/2016	Kepware	Manufacturing device connectivity	\$20.0	n/a	\$118.0	5.90x	n/a	n/a
Gamma Technologies	11/03/2015	Vuforia	Vision-based AR platform	n/a	n/a	\$64.8	n/a	n/a	n/a
	05/05/2015	ColdLight Solutions	Machine learning predictive analytics	\$7.1	n/a	\$103.8	14.56x	n/a	n/a
	01/01/2015	Caugnate	Augmented reality technologies services	n/a	n/a	n/a	n/a	n/a	n/a
Hexagon	07/23/2014	ITA Holdings	Sensor connectivity	n/a	n/a	\$170.0	n/a	n/a	n/a
	07/01/2014	Atego	Model-based systems applications	\$20.0	n/a	\$49.3	2.47x	n/a	n/a
	12/30/2013	ThingWorx	IoT platform for machines	\$6.0	n/a	\$130.0	21.67x	n/a	n/a
PTC	09/10/2013	NetIDEAS	Product development and PLM	\$1.0	n/a	\$20.0	20.00x	n/a	n/a
	07/16/2013	Enigma	Manufacturing content management	n/a	n/a	\$10.0	n/a	n/a	n/a
Siemens	Total High							21.67x	24.6x
	Total Low							1.00x	13.3x
	Total Average							5.12x	18.7x
Other	Total Median							4.22x	18.4x

Priority Acquirers & Notable Deals (Cont'd)

	(\$ in Millions)		Target Overview				Deal Value	Deal Value / LTM	
	Announced	Target	Description	LTM		Revenue		EBITDA	
				Revenue	EBITDA				
Altair									
Altium									
ANSYS	10/02/2012	Servigistics	Strategic service management	\$80.0	n/a	\$220.0	2.75x	n/a	
Aras	09/06/2011	4CS	Warranty lifecycle management	n/a	n/a	\$14.9	n/a	n/a	
	01/01/2011	Mortice Kern Systems	Configuration management software	\$67.9	\$10.1	\$304.0	4.48x	n/m	
	02/08/2010	Planet Metrics	Carbon information management	n/a	n/a	n/a	n/a	n/a	
Arena Solutions	06/08/2009	Relex	Reliability analysis software	n/a	n/a	\$24.3	n/a	n/a	
	02/12/2009	Synapsis	Manufacturing supply chain optimization	n/a	n/a	\$7.5	n/a	n/a	
	12/10/2008	Synapsis Technology	Software applications and consulting services	n/a	n/a	\$7.5	n/a	n/a	
	02/07/2008	Digital Human	Human simulation model	n/a	n/a	\$1.1	n/a	n/a	
Autodesk	12/03/2007	CoCreate Software	Flexible CAD & PLM for electronics	\$78.0	n/a	\$247.5	3.17x	n/a	
	11/07/2007	LBS	Integrated logistics support software	n/a	n/a	n/a	n/a	n/a	
Bentley	09/24/2007	NetRegulus	Enterprise regulatory management	n/a	n/a	\$2.3	n/a	n/a	
	05/16/2007	NC Graphics	High-speed machining and engineering tools	n/a	n/a	n/a	n/a	n/a	
	04/26/2006	Mathsoft	Calculation management	\$24.0	\$0.9	\$63.0	2.62x	n/m	
Dassault	11/28/2005	Cadtrain	E-learning courses for engineers	n/a	n/a	n/a	n/a	n/a	
	07/19/2005	Arbortext	Code authoring & publishing	\$40.0	n/a	\$190.0	4.75x	n/a	
	06/06/2005	Aptavis Technologies	Life cycle management software	n/a	n/a	n/a	n/a	n/a	
	04/08/2004	OHIO Design Automation	Electronics design collaboration software	n/a	n/a	\$12.0	n/a	n/a	
ESI Group	03/09/1999	Auxilium	Manufacturing collaboration	n/a	n/a	\$79.0	n/a	n/a	
	10/06/1998	InPart	Industrial 3D CAD	n/a	n/a	\$26.4	n/a	n/a	
Gamma Technologies	08/02/1995	Rasna	Design optimization & simulation	\$22.7	n/a	\$163.4	7.19x	n/a	
	Siemens		Total Disclosed M&A Deal Value: \$13.9 Billion						
Hexagon	12/03/2018	Comsa	Automotive design & analysis software	n/a	n/a	n/a	n/a	n/a	
	10/01/2018	Mendix	Low code application development platform	n/a	n/a	\$730.0	n/a	n/a	
PTC	09/19/2018	Lightwork Design	3D rendering designs and visualization systems	n/a	n/a	n/a	n/a	n/a	
	07/27/2018	Omative	Factory optimization system	n/a	n/a	n/a	n/a	n/a	
	06/26/2018	Comfy	Smart building management software	n/a	n/a	n/a	n/a	n/a	
Siemens	Total High						21.67x	24.6x	
	Total Low						1.00x	13.3x	
Other	Total Average						5.12x	18.7x	
	Total Median						4.22x	18.4x	

Priority Acquirers & Notable Deals (Cont'd)

	(\$ in Millions)		Target Overview				Deal Value	Deal Value / LTM	
	Announced	Target	Description	LTM		Revenue		EBITDA	
				Revenue	EBITDA				
Altair									
Altium									
ANSYS	06/22/2018	Austemper Design	Electronic design tools for circuit components	n/a	n/a	n/a	n/a	n/a	n/a
Aras	03/29/2018	Agilion	Real-time location systems (RTLs)	n/a	n/a	n/a	n/a	n/a	n/a
	02/07/2018	Sarokal Test Systems	Testing equipment platform for ASIC & FPGA	n/a	n/a	n/a	n/a	n/a	n/a
	01/31/2018	Milanovic Engineering	Engineering and manufacturing services	n/a	n/a	n/a	n/a	n/a	n/a
Arena Solutions	12/01/2017	Solido Design Automation	Variation-aware design and characterization	n/a	n/a	n/a	n/a	n/a	n/a
	10/16/2017	Mentor Infolytica	Electromagnetic and thermal analysis	n/a	n/a	n/a	n/a	n/a	n/a
	10/09/2017	Wi-Tronix	Predictive maintenance for rail services	n/a	n/a	n/a	n/a	n/a	n/a
Autodesk	08/30/2017	Tass International	Design and testing software for automotives	n/a	n/a	n/a	n/a	n/a	n/a
	03/31/2017	Mentor Graphics	Electronic design automation	\$1,282.5	\$267.2	\$4,500.0	3.51x	16.8x	
	11/07/2016	Conworx Technology	Lab device interfaces	n/a	n/a	n/a	n/a	n/a	n/a
Bentley	03/01/2016	CD-adapco	Specialized simulation based on CFD	\$190.0	n/a	\$970.0	5.11x	n/a	n/a
	03/01/2016	Neo New Oncology	Medical diagnostic technology	n/a	n/a	n/a	n/a	n/a	n/a
	11/25/2015	Polarion Software	Application lifecycle management	n/a	n/a	n/a	n/a	n/a	n/a
Dassault	07/02/2015	Zenco Systems	Traffic enforcement technology	n/a	n/a	n/a	n/a	n/a	n/a
	03/03/2015	AxIT	Order management & logistics	n/a	n/a	n/a	n/a	n/a	n/a
	10/15/2014	Camstar	Manufacturing execution systems	n/a	n/a	\$160.0	n/a	n/a	n/a
ESI Group	01/22/2014	IBS	Industrial productivity software	n/a	n/a	n/a	n/a	n/a	n/a
	12/19/2013	TESIS PLMware	Product lifecycle management	n/a	n/a	n/a	n/a	n/a	n/a
	06/25/2013	Sky Eye	Transport fleet management	n/a	n/a	n/a	n/a	n/a	n/a
Gamma Technologies	06/03/2013	Preactor	Manufacturing planning & scheduling	n/a	n/a	n/a	n/a	n/a	n/a
	05/02/2013	Invensys Rail	Railway design & system automation	\$1,179.5	n/a	\$2,660.0	2.26x	n/a	n/a
	11/15/2012	LMS	PLM simulation & testing	\$241.7	n/a	\$870.0	3.60x	n/a	n/a
Hexagon	09/28/2012	VRcontext	Visualization technology	n/a	n/a	n/a	n/a	n/a	n/a
	01/06/2012	eMeter	Energy information management	n/a	n/a	n/a	n/a	n/a	n/a
	12/01/2011	Vistagy	Specialized engineering environments	\$18.0	n/a	n/a	n/a	n/a	n/a
PTC	08/16/2011	Advanced Telemetry	Energy management	n/a	n/a	n/a	n/a	n/a	n/a
	10/01/2009	Energy4u	Energy IT services	n/a	n/a	n/a	n/a	n/a	n/a
	09/30/2009	YSNC	Machine engineering	n/a	n/a	n/a	n/a	n/a	n/a
Siemens	Total High							21.67x	24.6x
	Total Low							1.00x	13.3x
Other	Total Average							5.12x	18.7x
	Total Median							4.22x	18.4x

(\$ in Millions)		Target Overview					
Announced	Target	Description	LTM		Deal Value	Deal Value / LTM	
			Revenue	EBITDA		Revenue	EBITDA
Siemens (Cont'd)			Total Disclosed M&A Deal Value: \$13.9 Billion				
06/22/2018	Austemper Design	Electronic design tools for circuit components	n/a	n/a	n/a	n/a	n/a
03/29/2018	Agilion	Real-time location systems (RTLS)	n/a	n/a	n/a	n/a	n/a
02/07/2018	Sarokal Test Systems	Testing equipment platform for ASIC & FPGA	n/a	n/a	n/a	n/a	n/a
01/31/2018	Milanovic Engineering	Engineering and manufacturing services	n/a	n/a	n/a	n/a	n/a
12/01/2017	Solido Design Automation	Variation-aware design and characterization	n/a	n/a	n/a	n/a	n/a
10/16/2017	Mentor Infolytica	Electromagnetic and thermal analysis	n/a	n/a	n/a	n/a	n/a
10/09/2017	Wi-Tronix	Predictive maintenance for rail services	n/a	n/a	n/a	n/a	n/a
08/30/2017	Tass International	Design and testing software for automotives	n/a	n/a	n/a	n/a	n/a
03/31/2017	Mentor Graphics	Electronic design automation	\$1,282.5	\$267.2	\$4,500.0	3.51x	16.8x
11/07/2016	Conworx Technology	Lab device interfaces	n/a	n/a	n/a	n/a	n/a
03/01/2016	CD-adapco	Specialized simulation based on CFD	\$190.0	n/a	\$970.0	5.11x	n/a
03/01/2016	Neo New Oncology	Medical diagnostic technology	n/a	n/a	n/a	n/a	n/a
11/25/2015	Polarion Software	Application lifecycle management	n/a	n/a	n/a	n/a	n/a
07/02/2015	Zenco Systems	Traffic enforcement technology	n/a	n/a	n/a	n/a	n/a
03/03/2015	AxIT	Order management & logistics	n/a	n/a	n/a	n/a	n/a
10/15/2014	Camstar	Manufacturing execution systems	n/a	n/a	\$160.0	n/a	n/a
01/22/2014	IBS	Industrial productivity software	n/a	n/a	n/a	n/a	n/a
12/19/2013	TESIS PLMware	Product lifecycle management	n/a	n/a	n/a	n/a	n/a
06/25/2013	Sky Eye	Transport fleet management	n/a	n/a	n/a	n/a	n/a
06/03/2013	Preactor	Manufacturing planning & scheduling	n/a	n/a	n/a	n/a	n/a
05/02/2013	Invensys Rail	Railway design & system automation	\$1,179.5	n/a	\$2,660.0	2.26x	n/a
11/15/2012	LMS	PLM simulation & testing	\$241.7	n/a	\$870.0	3.60x	n/a
09/28/2012	VRcontext	Visualization technology	n/a	n/a	n/a	n/a	n/a
01/06/2012	eMeter	Energy information management	n/a	n/a	n/a	n/a	n/a
12/01/2011	Vistagy	Specialized engineering environments	\$18.0	n/a	n/a	n/a	n/a
08/16/2011	Advanced Telemetry	Energy management	n/a	n/a	n/a	n/a	n/a
10/01/2009	Energy4u	Energy IT services	n/a	n/a	n/a	n/a	n/a
09/30/2009	YSNC	Machine engineering	n/a	n/a	n/a	n/a	n/a
Total High						21.67x	24.6x
Total Low						1.00x	13.3x
Total Average						5.12x	18.7x
Total Median						4.22x	18.4x

Priority Acquirers & Notable Deals (Cont'd)

Altair
Altium
ANSYS
Aras
Arena Solutions
Autodesk
Bentley
Dassault
ESI Group
Gamma Technologies
Hexagon
PTC
Siemens
Other

(\$ in Millions)		Target Overview				Deal Value	Deal Value / LTM	
Announced	Target	Description	LTM		Revenue		EBITDA	
			Revenue	EBITDA				
Siemens (Cont'd)			Total Disclosed M&A Deal Value: \$13.9 Billion					
04/01/2009	Elan Software	Process control software	n/a	n/a	n/a	n/a	n/a	
11/17/2008	Syncos	Digital manufacturing engineering	n/a	n/a	n/a	n/a	n/a	
05/07/2007	UGS	2D & 3D PLM and industry automation	\$1,150.0	n/a	\$3,500.0	3.04x	n/a	
02/02/2007	ETM	Supervisory & data acquisition systems	n/a	n/a	n/a	n/a	n/a	
10/31/2006	VistaScape	Surveillance video analysis	n/a	n/a	n/a	n/a	n/a	
09/28/2005	Garderos	Local area network management	n/a	n/a	n/a	n/a	n/a	
08/14/2005	Transmitton	Railway infrastructure management	n/a	n/a	n/a	n/a	n/a	
04/08/2005	Myrio	IP video networking	n/a	n/a	\$50.0	n/a	n/a	
12/06/2004	Chantry Networks	Mobility-enabled wireless networking	n/a	n/a	\$85.0	n/a	n/a	
04/01/2003	Cycos	Unified messaging systems	n/a	n/a	\$45.6	n/a	n/a	
04/23/2002	Symbian	Mobile operating system	n/a	n/a	\$309.0	n/a	n/a	
Total High						21.67x	24.6x	
Total Low						1.00x	13.3x	
Total Average						5.12x	18.7x	
Total Median						4.22x	18.4x	

Priority Acquirers & Notable Deals (Cont'd)

Altair
Altium
ANSYS
Aras
Arena Solutions
Autodesk
Bentley
Dassault
ESI Group
Gamma Technologies
Hexagon
PTC
Siemens
Other

(\$ in Millions)			Target Overview					
Announced	Acquirer	Target	Description	LTM		Deal Value	Deal Value / LTM	
				Revenue	EBITDA		Revenue	EBITDA
Other						Total Disclosed M&A Deal Value: n/a		
10/16/2018	Jonas Software	Greycon	MES & production planning	n/a	n/a	n/a	n/a	n/a
08/16/2018	Sphera Systems	Sparesfinder	MRO data management	n/a	n/a	n/a	n/a	n/a
07/31/2018	Plex Systems	Dattus	IIoT connectivity for manufacturing	n/a	n/a	n/a	n/a	n/a
Total High							21.67x	24.6x
Total Low							1.14x	13.3x
Total Average							5.21x	18.7x
Total Median							4.29x	18.4x

Comparable Public Companies

Company	Market Data			Operating Data								Valuation Ratios			
	Price \$	Equity	Enterprise	Revenue		Growth %		EBITDA		EBITDA Margin %		EV / Revenue		EV / EBITDA	
	3/8/2019	Value	Value	CY2018A	CY2019E	'17 - '18	'18 - '19	CY2018A	CY2019E	CY2018E	CY2019E	CY2018A	CY2019E	CY2018A	CY2019E
Altair	\$36.00	\$2,545	\$2,542	\$396	\$478	18.9%	20.6%	\$39	\$63	9.9%	13.2%	6.41x	5.32x	n/m	n/m
Altium	\$23.32	\$3,043	\$2,985	\$155	\$194	23.5%	24.8%	\$61	\$75	39.1%	38.6%	19.22x	15.40x	n/m	n/m
ANSYS	\$177.43	\$14,869	\$14,091	\$1,294	\$1,444	18.1%	11.6%	\$539	\$655	41.7%	45.4%	10.89x	9.76x	26.1x	21.5x
AspenTech	\$98.26	\$6,839	\$7,004	\$522	\$562	6.3%	7.6%	\$232	\$282	44.3%	50.3%	13.42x	12.47x	n/m	24.8x
Autodesk	\$152.37	\$33,369	\$34,503	\$2,527	\$3,231	23.0%	27.9%	\$78	\$823	3.1%	25.5%	13.65x	10.68x	n/m	n/m
Cadence	\$59.16	\$16,588	\$16,497	\$2,138	\$2,291	10.0%	7.2%	\$526	\$789	24.6%	34.5%	7.72x	7.20x	n/m	20.9x
Dassault	\$148.21	\$37,794	\$35,721	\$3,982	\$4,374	2.7%	9.8%	\$1,196	\$1,489	30.0%	34.1%	8.97x	8.17x	29.9x	24.0x
ESI Group	\$27.50	\$154	\$193	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hexagon	\$50.17	\$18,212	\$20,457	\$4,306	\$4,540	4.0%	5.4%	\$1,355	\$1,504	31.5%	33.1%	4.75x	4.51x	15.1x	13.6x
Nemetschek	\$153.83	\$5,922	\$5,960	\$525	\$605	10.0%	15.2%	\$140	\$163	26.7%	27.0%	11.36x	9.86x	n/m	n/m
PTC	\$88.46	\$10,491	\$10,967	\$1,270	\$1,371	7.3%	7.9%	\$163	\$412	12.9%	30.0%	8.64x	8.00x	n/m	26.6x
Siemens	\$108.78	\$87,274	\$113,837	\$95,417	\$97,798	(2.2%)	2.5%	\$10,108	\$12,477	10.6%	12.8%	1.19x	1.16x	11.3x	9.1x
Synopsys	\$103.20	\$15,449	\$15,405	\$3,155	\$3,364	13.1%	6.6%	\$589	\$922	18.7%	27.4%	4.88x	4.58x	26.1x	16.7x
High		\$87,274	\$113,837	\$95,417	\$97,798	23.5%	27.9%	\$10,108	\$12,477	44.3%	50.3%	19.22x	15.40x	29.9x	26.6x
Low		\$154	\$193	\$155	\$194	(2.2%)	2.5%	\$39	\$63	3.1%	12.8%	1.19x	1.16x	11.3x	9.1x
Average		\$19,427	\$21,551	\$9,641	\$10,021	11.2%	12.3%	\$1,252	\$1,638	24.4%	31.0%	9.26x	8.09x	21.7x	19.7x
Median		\$14,869	\$14,091	\$1,716	\$1,867	10.0%	8.9%	\$379	\$722	25.7%	31.6%	8.80x	8.08x	26.1x	21.2x

Engineering Software Practice

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Electronics PLM /
QMS / ALM



3D composites CAD

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- Craig Livingston, Arena PLM Solutions CEO 



Open source
mechanical PLM



Discrete mfg.
PLM / QMS

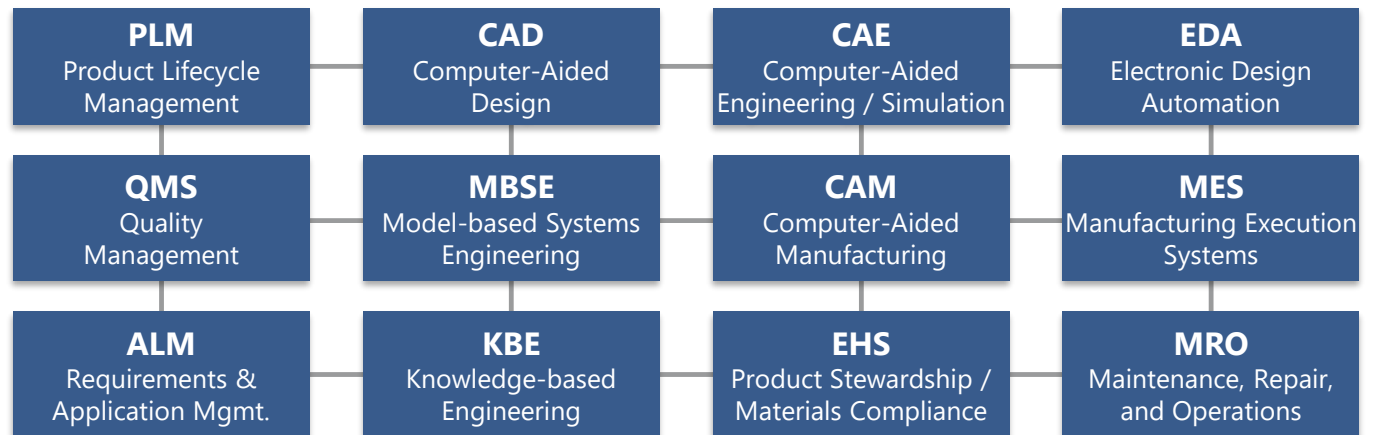


Manufacturing
workflow mgmt.



Collaborative
product modeling

Key Coverage Segments



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