

ANSYS: 20 Years of Uninterrupted Business Growth Provides a Solid Foundation for the Next 20 Years

CIMdata Commentary

Key takeaways:

- *A major transformation is underway to model-based systems engineering processes for complex products and systems that span multiple domains within the engineering discipline (e.g., mechanical, electronics, embedded software, and controls) as well as multiple other disciplines across the entire lifecycle*
- *The need to simulate the behavior of today's complex systems, especially in the cyber-physical realm, has led to a number of strategic acquisitions by ANSYS over the past 10 years in the areas of electronics and software engineering*
- *Tomorrow's interconnected smart systems will require new capabilities that ANSYS is now developing in preparation for the widespread adoption of new approaches such as Model-Based Systems Engineering and the "Digital Twin"*
- *ANSYS is committed to providing best-in-class multi-physics modeling and simulation capabilities and will continue to execute on its long-term vision for Simulation-Driven Product Development*

Significant global product development trends are making multi-domain, systems-level virtual prototyping and performance simulation capabilities an indispensable element in enabling the transformation to simulation-driven product development, especially for complex cyber-physical systems. These major business trends include:

- Smart systems being driven by the Internet of Things (IoT) and Industry 4.0
- Mass customization with software features being a key differentiator
- Design-for-purpose materials and new manufacturing methods (e.g., additive)
- Design-for-energy efficiency and sustainability, green, conservation, and re-use
- Products delivered as services; an on-going innovation and utility business model (human feedback loops and machine learning based on data analytics)

Systems-level virtual prototyping and in-service performance emulation throughout the entire product lifecycle (i.e., the enablement and maintenance of a "digital twin") will be a foundational element in developing MBSE processes that enable product innovation, quality, and profitability throughout the product lifecycle from ideation through the designed life.

ANSYS Looks to the Future of Performance Simulation

CIMdata recently participated in the ANSYS Investor Day forum in Pittsburgh, an annual event held for the Wall Street investment community to update them on the major trends and growth opportunities in the PLM/Simulation & Analysis market space. Participants heard from several major ANSYS customers (e.g., Cummins, Inc. and The Procter & Gamble Co.) on their use of the ANSYS multi-physics product portfolio and their future plans for deploying even more simulation capabilities. Jim Cashman, CEO of ANSYS, and his senior management team briefed the financial community participants on ANSYS' vision and strategy for the next 20 years of continued strong revenue growth, technology leadership and market leadership (see Figure 1 below).

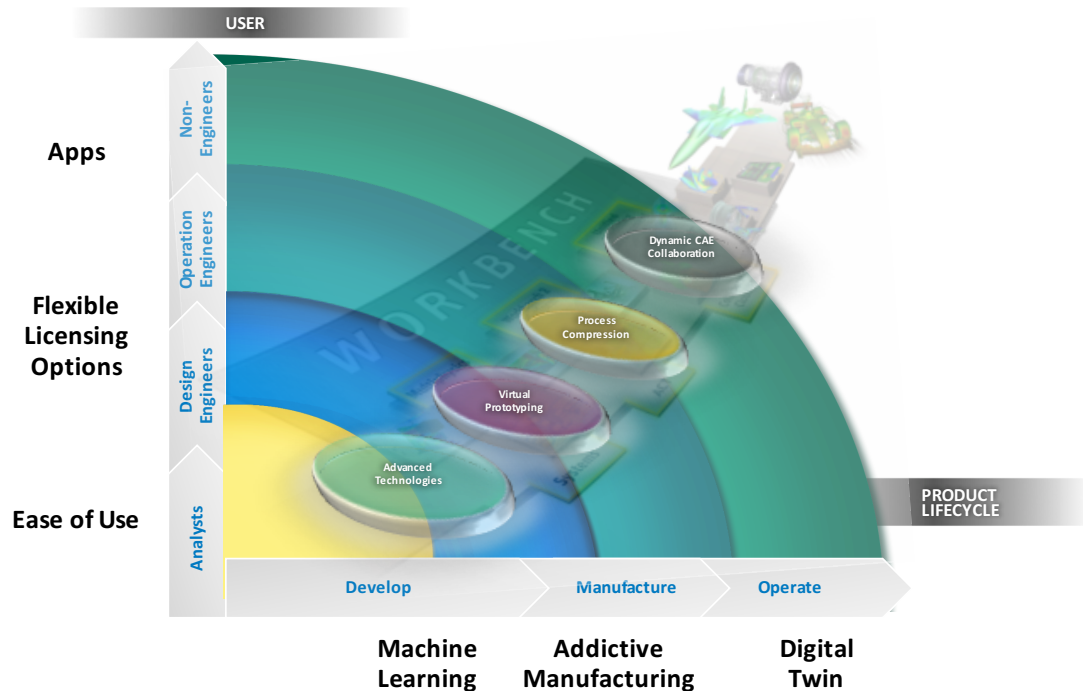


Figure 1—ANSYS' Vision for the Next 20 Years
(Courtesy of ANSYS)

The ANSYS product leadership team highlighted the major initiatives underway to address the global market trends and opportunities highlighted above. This included a series of presentations covering:

- 1) Growth opportunities (Mr. Sin Min Yap, VP, Global Corporate Strategic Initiatives)
 - Internet of Things (IoT), cloud, platform, Model-Based Systems Engineering (MBSE), digital twin, 3D printing, machine learning, and new users
- 2) ANSYS Product & Technology Roadmap (Mr. Walid Abu-Hadba, Chief Product Officer)
 - Elastic licensing, app store, AIM, big data & analytics, IoT, and additive manufacturing
 - Structures, electronics, fluids, semiconductors, systems, embedded S/W
- 3) Complete Systems Simulation (Mr. Eric Bantegnie, VP & GM: Systems Business)
 - Integrating IoT with physics-based simulation—*Digital Twins with GE*
- 4) Integrated Chip Package System (Mr. John Lee, VP & GM-Semiconductor Business)
 - Integrating big data for cyber-physical systems: *SeaScape™ Platform*
- 5) Sales and marketing strategy (Mr. Bob Kocis, VP, Worldwide Sales & Customer Excellence and Mr. Mark Hindsbo, VP, Marketing)
 - Customer quality monitoring and feedback system for software and services
 - Flexible licensing options: Desktop to Cloud to HPC to Enterprise Unlimited

It is significant to note that virtually this entire senior management team has joined ANSYS within the last several years, either via strategic acquisitions such as Mr. Bantegnie (Esterel Technologies), Mr. Lee (Gear Design Solutions) or were actively recruited from other leading enterprise software companies such as Mr. Abu-Hadba and Mr. Hindsbo (Microsoft) and Mr. Yap and Mr. Kocis (PTC). In this manner, ANSYS has created a strong management team with extensive industry experience at larger enterprise software companies, some of which

have prospered through the transition from mid-size applications software providers to breaking through \$1Billion per year in sales to larger, integrated platform providers that can sustain above market average growth rates despite their much larger scale.

The ability of ANSYS to maintain a double-digit annual growth rate is of particular interest and concern to the financial community that attended this Investor event. The overall PLM software market and the Simulation & Analysis (S&A) segment experienced well below average growth in 2015 at approximately 4% in US Dollars. Macroeconomic factors related to the extremely strong U.S. Dollar, the economic downturn in China, and the political instability and related economic issues in the European Union were all negative factors on business growth. While some of these macro issues are continuing into the first half of 2016, CIMdata has forecast that the Simulation & Analysis market should return to a healthier growth rate in 2016 and is projecting a 5-year CAGR of approximately 8%.

Due to the need to perform more physics-based simulations of complex cyber-physical systems resulting from global initiatives such as energy sustainability and green, additive manufacturing, the role of the digital twin in IoT and Industry 4.0 powered by big data analytics and engineered organic materials for bio-engineering, CIMdata believes that the S&A market growth rate will eventually return to the low double-digit rates experienced consistently prior to the 2009 global downturn. However, the exact timing of this “breakout” in the more significant usage of simulation technologies is very difficult to accurately predict at this time.

CIMdata is relatively confident in predicting that ANSYS will continue to be a market leader in the physics-based behavior simulation solutions market and will continue to act as a consolidator of niche simulation companies that round out the ANSYS multi-physics technology, as well as contribute to a multi-domain platform for optimizing the designs of complex cyber-physical systems. With its strong balance sheet and large market capitalization to annual sales ratio, ANSYS management also has strategic options available to acquire larger companies with technologies and expertise that enable ANSYS to enter important adjacent markets for simulation and analysis software growth such as Model-Based Systems Engineering, IoT, digital twin, machine learning, human modeling and bio-materials engineering, and additive manufacturing.

Since becoming a public company 20 years ago, ANSYS has proven to be highly effective at acquiring and successfully integrating companies that meet its technology, people, cultural, and financial criteria. ANSYS’ acquisitions have been very accretive for shareholders as reflected in the ANSYS share price, which is up by over 2,800% since 1996. CIMdata expects to see ANSYS continue to grow profitably via both organic R&D and via M&A, most likely sooner rather than later in the next 20-year period.

About CIMdata

CIMdata, an independent worldwide firm, provides strategic management consulting to maximize an enterprise’s ability to design and deliver innovative products and services through the application of Product Lifecycle Management (PLM). CIMdata provides world-class knowledge, expertise, and best-practice methods on PLM. CIMdata also offers research, subscription services, publications, and education through international conferences. To learn more about CIMdata services, visit our website at <http://www.CIMdata.com> or contact CIMdata at: 3909 Research Park Drive, Ann Arbor, MI 48108, USA. Tel: +1 734.668.9922. Fax: +1 734.668.1957; or at Oogststraat 20, 6004 CV Weert, The Netherlands. Tel: +31 (0) 495.533.666.