CIMdata eBook
Sponsored by Ansys

Speeding Your Digital Transformation Journey

Image courtesy of Ansys

CIMdata® | Global Leaders in PLM Consulting
www.CIMdata.com

A Smart Connected World

Trends like social, mobile, big data, analytics, cloud, and the internet of things (SMACI) have transformed commerce and everyday life

SMACI Has a Profound Impact on Business Today

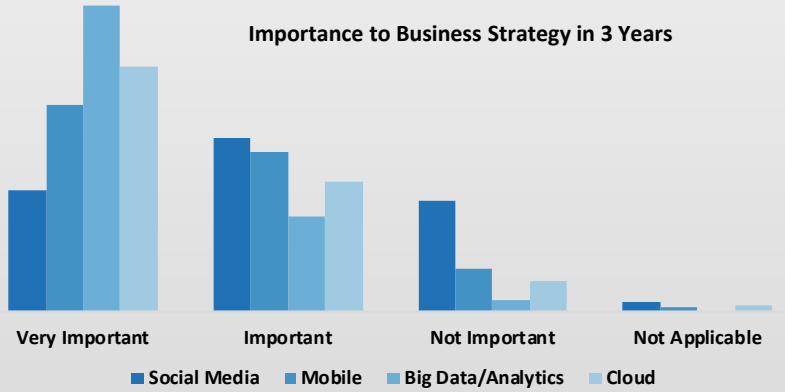
Computing has transformed business over the last fifty years, but the last twenty have seen applications of computing technology significantly impact business and society at large. Much of the world is connected using social platforms like Facebook, Twitter, Weibo, and WeChat. More computing is done in people's hands using mobile devices rather than sitting at a desk. Our business and personal data permeate the cloud. Access to cheap computing, communications, and electronics powers the Internet of Things (IoT) and makes it cheaper to smarten up brownfield factories in Industrial IoT (IIoT) applications. All of these computing and network applications generate vast oceans of structured and unstructured data that need to be mined using a growing range of analytics and artificial intelligence (AI) techniques.

Products in most categories are increasingly smart and connected. Google set the market for smart connected startups by acquiring Nest for US$3.2 billion in 2014, but just about everything is smart. Every day seemingly brings a new investment by an established automotive manufacturer in autonomous vehicles. eBike docks are popular in many cities around the world and dockless eScooters are littering sidewalks in cities and suburbs. Once used for actually conversing with other people, phones are the hubs of peoples' lives, linking with smart connected products and applications to serve just about any need. This includes tracking and managing our health. A lot of industrial equipment is smart and connected out of the box, and legacy equipment can be cheaply made smarter and connected in brownfield environments.

Digital Transformation is a Key Enabler

These same trends drove the creation of the Industry 4.0 vision, where everything is smart, networked, and focused on profitably serving markets of one with products tailored to individual wants and needs. Governments and industrial firms around the world have embraced some or all of this vision, helping to power a wave of digitalization and digital transformation across industries and economies. For these reasons, CIMdata is conducting a global research study on how industrial firms are faring in this complex digital business environment. This eBook includes some early results from this research.

For example, 50% of respondents said big data/analytics are "very important" today, rising to 73% in three years. 41% view cloud as very important today, rising to 63% in three years. 29% of respondents see smart connected products as very important to their company today, rising to 72% in three years.



Everyone is Talking Digital

Companies in just about all industries are facing digital transformation challenges

Digital Thread Leads to Digitalization

Digital is everywhere in people's lives. At one time, computing was an activity done at work. Now it is just a daily activity for many. In the world of the product lifecycle, digital and its many variants—digitization, digitalization, digital transformation, digital twin, digital thread—are shorthand for topics, processes, and capabilities that the product lifecycle management (PLM) economy has championed since before "PLM" was coined some twenty years ago. *Digitization*, getting all intellectual assets in digital form has been on-going for decades. There was some value in having dumb image files managed (there still is) but value soars when models and assets are digital and managed as data.

This product information, and much more, is part of the *digital thread* which can span from the initial idea through life. Every requirement defined, alternative considered, decision made, and associated supporting information can be managed across every stage of the product lifecycle. This now includes data from smart, connected products, providing more visibility into product usage and failure than ever before. *Digital twins* are virtual representations of physical products that can help supercharge collaboration and decision making. Some maintain that a digital twin cannot really exist until its physical counterpart does, but virtual prototypes have created tremendous value for industrial companies, and market success for their tool providers. More importantly, it is this virtual prototyping activity that provides the models needed to make twins that match a physical product. Those same tools help evolve the virtual to synch with the real, matching changes to the physical product.

While 11% of our survey respondents say they have digital twins in production today, they expect this will rise to 34% in three years. The top two benefits expected? Better collaboration across engineering functions and more "first time right" products.

Digital Transformation

The use of digital technologies to change a business to provide new revenue and value-producing opportunities has moved from digital audio and photography in the 1990s throughout the service sector in the mid-2010s. Today no industrial segment can afford to ignore this wave of change. But CIMdata maintains that for product companies to reach their digital transformation (DT) objectives they really need a strong PLM strategy and implementation to define and manage the digital thread. While DT initiatives can originate in other parts of the business, for digital transformation to have maximum impact PLM must be integral to the DT program.

80% of our survey respondents have an on-going digital transformation initiative. Thankfully, only 13% are running their digital transformation initiative unconnected from their PLM efforts.

Simulation and optimization are critical for digital transformation

Digital transformation can involve multiple digital threads depending on business requirements and domain-specific use cases.

"Navigating digital transformation is about adapting to a constantly evolving environment and using existing tools and data in new ways. With the use of simulation expected to expand in the coming years, [Ansys] Minerva is important to Eaton and plays a key part in our larger, enterprise wide digital prototyping and additive manufacturing (AM) initiatives," said **Todd Earls, Vice President of Information Technology at Eaton**. "Additionally, traceability and management are essential for efficiency and there are many steps necessary to design and manufacture parts using AM or other processes. Ansys Minerva will help make our user experience more streamlined than it is today."

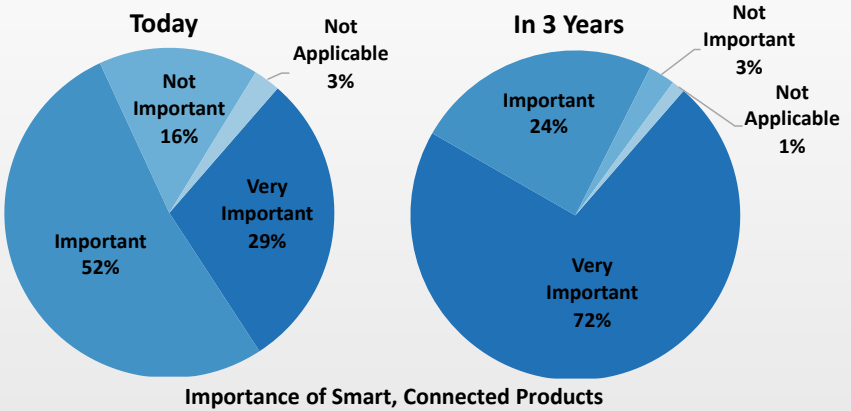
Lifecycle Digitalization

Data collected, managed, and leveraged throughout the product lifecycle is essential to navigating the digital future

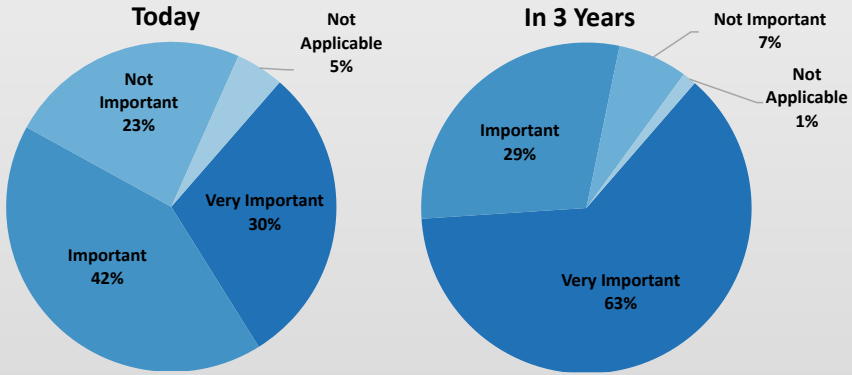
PLM's Role in Digitalization

What are companies doing today to meet their PLM objectives in support of digital transformation? Let's start with a definition of PLM. To CIMdata, PLM is a strategic business approach enabled by an appropriate set of technologies and processes. While there are solutions in the marketplace labeled as PLM, a PLM strategy is always much broader than just one named solution. PLM is about the collaborative creation, use, management, and dissemination of product-related intellectual assets and processes. It spans from idea through life. Which tools are used to generate this intellectual property (IP) depends on a company's products. Companies making complex electro-mechanical products will use different tools than a company making toothpaste. But they all need a single source of truth to manage their data and processes.

Over the last several years, the market and technology for delivering these types of capabilities have evolved into a platform approach, mimicking the broader enterprise software market.



Importance of Smart, Connected Products



Importance of IoT to Company Strategy

Platforms for PLM

An essential foundation for today's and tomorrow's digitalization needs

PLM Platforms Provide Broad, Extensible Support into the Future

CIMdata worked with Gartner and IDC to define the product innovation platform, a consolidated set of capabilities that span the lifecycle, help associatively manage all intellectual property, help define and manage product configurations, and support cross-functional lifecycle optimization in concert with other enterprise data and applications. The product innovation platform enables the digital thread, a communication framework that provides an integrated view of an asset's data throughout its lifecycle. It supports cross-functional work across traditionally siloed functional perspectives. The product innovation platform truly powers lifecycle digitalization.

These platforms are increasingly being used to support model-based development processes. Products exhibit all kinds of complicated behaviors alone. But smart, connected products often interact in complex ways, some that humans have not defined. Models can be very useful to test ideas before investing in full, detailed product model development. Of course, MCAD solutions have long provided one type of very useful model. But just as there are many variants on the word digital, "model-based" begins many different phrases used to describe the application of models to address different problems in product development. Many companies use *model-based definition* (MBD): using 3D models—including solid models, 3D product and manufacturing information, and associated metadata—to define individual components and product assemblies. If done right, MBD can simplify buyer-supplier relationships in the value chain. *Model-based systems engineering* (MBSE) arose in aerospace & defense but it is seeing application in many industries, including medical devices. This formalized approach to applying modeling to support system requirements, design, analysis, verification, and validation really helps companies in regulated industries answer those tough questions about their fielded products. It is these models that help companies seamlessly move between the virtual and the real.

Customers are linking simulation to PLM processes

While PLM is a broad term, customers are seeing it as a shift away from a singular, rip-and-replace approach to a more federated, lightweight approach—involving complementary domain-specific product innovation systems with open connectivity.

As simulation informs every development decision, our customers are focused on digitally transforming simulation intellectual property (IP) into valuable, highly controlled corporate assets. To do this, they must address significant scale and complexity challenges, including tools heterogeneity, data and process management, integration with high-performance computing (HPC), and traceability. Additionally, they must make sophisticated multiphysics simulation and optimization assets widely available across engineering teams and product lifecycles.

Ansys delivers an open-ecosystem simulation platform. It includes Ansys Minerva, a centralized knowledge management application that complements PDM and PLM systems, and Ansys optiSLang, a CAE-based design optimization toolbox. Both are highly scalable and configurable platform solutions that empower customers to map their next-generation digital product development journey—from multiphysics best practices capture to vendor-neutral process integration and design optimization, to enterprise deployment of simulation. Offering an exceptional user experience and deployable on-premise and in the cloud, these cutting-edge tools are instrumental for advancing state-of-the-art autonomous vehicle (AV), electrification, and 5G product development.

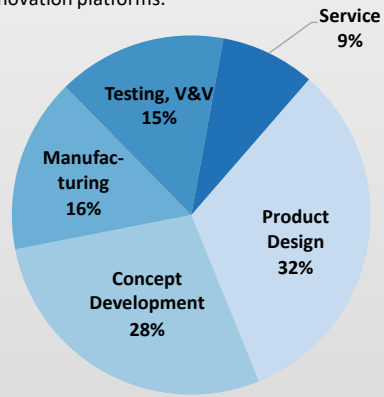
From Virtual to Real

Making better products today requires understanding their function, behavior, manufacturing, and use in the virtual world first

Over the last thirty years the trend in many industries has been to do more virtually. It is what shrank new car development programs from over 8 years in the 1980s to 2 to 5 years today, depending on the type of vehicle. Advances in computing and software made this possible. And computing power? Moore's Law is often cited, but it really was more of an observation—the speed and capability of computers can be expected to double every two years—by Gordon Moore, a semiconductor pioneer who went on to found Intel. Ever cheaper, more powerful, and eventually ubiquitous computing brought simulation to the desktop and beyond. Companies could virtually crash thousands of cars instead of building hundreds to physically destroy in tests to validate their designs and analyses. In the past, simulation required highly educated, specialized analysts to get the most out of virtual analysis capabilities. Today, simulation is becoming pervasive, with easy-to-use capabilities put in the designers' hands to drive their decision-making ever earlier in the conceptual design phase. This expanded use of virtual analysis shows up in market results. This chart from our research shows the emphasis on simulation early in the lifecycle.

Simulation's Role

Using simulation up front in the lifecycle is becoming a necessity. Modern tools and access to computing power lets companies test thousands of design alternatives, assessing them on the physical properties they define. Do they meet requirements? Making the right decisions early saves time and money. Studies of the product development process have shown that as much as 80% of a product's costs are locked in early in the design phase. Companies are using simulation and configuration management techniques to delay those decisions as late as possible without impacting delivery schedules or cost. Just the type of complex, cross-functional optimization increasingly supported by today's product innovation platforms.



Use of Simulation by Lifecycle Stage

Pervasive simulation drives innovation

Companies leverage Ansys solutions to establish simulation-based design optimization workflows.

With a broad portfolio of multiphysics and systems simulation, Ansys is positioned to meet customers' need at scale—now and in the future. Ansys simulation offers a CAD/PLM/IoT-agnostic approach that complements customers' existing ecosystems, supported by an open services and standards-based platform that bakes in AI based-modeling to compute cause-and-effect outcomes.

Ansys simulation solutions combined with Ansys Minerva and Ansys optiSLang empower customers to:

- CAPTURE best practices with the right quality and consistency
- CONNECT vendor-neutral, complex process chains that optimize and enable collaboration across engineering disciplines
- DEPLOY simulation as an everyday engineering aid that is accessible to more users to help manage data, processes, and HPC

With these foundational capabilities, Ansys and its partners and customers can better target solutions across MBSE, cybersecurity, autonomous systems, digital twins, and other digital transformation initiatives.

Getting to Markets of One

Making individual products at a profit will require more product and process modularity…and often more advanced manufacturing technologies

Modularization Leads to Product Innovation

Based on the results to date, modeling and simulation can help companies design and manufacture better products often at higher profitability. But does this alone help them transform their business and provide customized products that delight their customers? The Industry 4.0 vision is to support mass customization, making products serving markets of one consumer. For years, many companies have used a platform approach to define their product lines to help them deliver customized products to their customers. Inherent to this is the notion of modularity, making a range of modules or building blocks that can be chosen and integrated seamlessly within the product. Personal computers are a good example.

Industrial equipment firms are often characterized as configure-to-order (CTO) or engineer-to-order (ETO) because their platforms can be tailored to meet both pre-defined and new requirements. In fact, companies in many industries rely on CTO and ETO strategies. Cars are a ubiquitous example. Car models are available with a range of options: two-door, four-door; hardtop or convertible; a choice of engines, transmissions, seats, trim packages, sound systems, wheels, suspensions, etc. And there are often complex dependencies between options—if you choose the more powerful engine you also need the enhanced suspension, brakes, and tires, for example. Car dealers provide online configuration tools to help prospective customers configure and price their dream car. Using such a tool to configure a 2018 Aston Martin DB11, their entry level vehicle, it is possible to define over 900,000 unique buildable configurations! ETO is the strategy of 32% of respondents, with CTO at 28%.

Need for Advanced Variant Configuration

Defining these product platforms, options, and dependencies demands robust advanced configuration management capabilities. Products must be designed to be more modular. Many of the leading PLM solution providers are investing heavily in advanced variant configuration management capabilities to support these requirements. Simulation is key to this process, helping assess product configuration decisions to make better decisions. This platform approach can provide significant quality, profitability, and schedule benefits.

Taking a modular design approach also makes it easier to evolve a company's value chain by bringing in alternative suppliers for specific modules. This can be onerous, requiring significant paperwork, audits at multiple levels, rounds of sampling, and other techniques common in supply chain management programs. To short circuit this process while maintaining quality, timeliness, and optimizing cost, manufacturing companies are turning to global, online marketplaces to find new value chain partners. The marketplace evaluates potential members, gathering the necessary data and conducting the due diligence required to ensure that this new supplier will meet prospective customers performance requirements. This allows manufacturing companies to bring in advanced technologies and offer new features to make their products unique.

Heterogeneous tools ecosystem demands openness

Ansys' solutions are designed to interface with a variety of systems—from PLM, ALM and ERP to IoT. As a result, customers are able to hand off results as complex product configurations, designs are virtually validated, and simulation insights are available across the product lifecycle.

In addition, Ansys' strategic partnerships bring to market streamlined, holistic, end-to-end solutions from design and automation to production.

See press releases:
Rockwell Automation and Ansys Announce Strategic Partnership, Driving Quicker Time to Market and Operational Efficiency for Customers

Ansys and SAP Partner to Unveil Insights from Rich Data Across Engineering and Operations Value Chains

CIMdata®

Smart Manufacturing

Cheap, reliable IoT modules, edge computing, and advances in manufacturing technologies can help make brownfield factories smart

Smart and Connected World

Products are not the only things that are smart and connected. Making tailored products with small lot sizes requires a lot of intelligence on the shop floor and manufacturing facilities that are as configurable as the products they seek to produce. Manufacturing operations need to be smart and connected, within the factory and out to the extended enterprise. But what is today's reality? Most manufacturing facilities in the developed world are brownfields, often with a mix of old and new equipment, some smart, others not so much. The use of foundational manufacturing solutions like manufacturing execution systems (MES) and manufacturing operations management (MOM) is not consistent across original equipment manufacturers and their tiers of suppliers.

Digital manufacturing solutions to support manufacturing process planning and factory simulation have been available for decades. Here digital twins must mimic both product and manufacturing processes, and interoperate to ensure product quality and manufacturability. While available for many years, most implementations of digital manufacturing solutions are in larger manufacturing enterprises in industries like automotive, aerospace & defense, and high tech. And even those firms historically struggled to capture their as-built environments to power their factory simulations.

Technologies Make the Difficult Achievable

Advances in a range of technologies are providing much needed assistance. Industrial IoT specialists offer standard modules with computing, sensors, and communications to make machines smarter. Edge computing technology helps capture shop floor data to improve decisions, often right at the edge device installed in the factory. 3D laser scanners are increasingly effective at capturing the as-is, brownfield environment. At its simplest, scan data can provide the 3D context in which to redesign a manufacturing operation. But the scan data has many other applications. It can be leveraged for understanding the as-maintained state of factory equipment. Just as it provides the 3D context for planning, it can also be used as context in virtual reality (VR) scenarios for training purposes.

Additive manufacturing (AM) has moved from use mainly to produce non-functional prototypes to making production-quality parts that are often stronger, cheaper, and simpler than their predecessors. Today, companies are also using AM and subtractive manufacturing processes, like machining, in combination. As AM processes and materials engineering advance, companies will be able to design materials and select the right fabrication process to yield their ideal part. There are some AM machines today that can print parts with embedded wires and electronics. This is just the kind of technology that companies need to profitably serve markets of one.

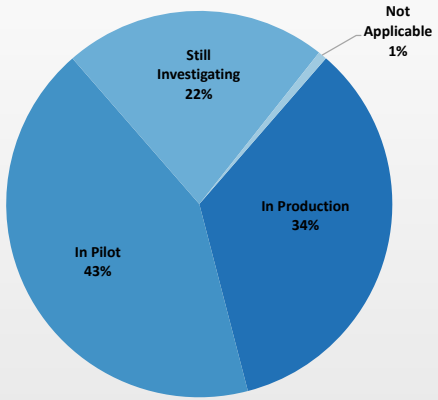
"An AM strategy needs to account for a unique array of gnarly upfront design challenges and manufacturing capabilities, which are new to the traditional engineering approach to component design. Ansys offers a unified simulation-driven design platform for AM, with a comprehensive suite of cutting-edge simulation tools for manufacturability assessment, in-depth materials quality investigation, materials intelligence, and simulation management. Additionally, the Ansys partner ecosystem—from academia through 3D-printer manufacturers—enables continuous end-to-end workflows. Ansys' unparalleled depth and breadth of solutions, including metal and thermo forming, help customers meet the paradigm shifts in manufacturing." **Dave Conover, Chief Technologist, Additive Manufacturing Technologies, Ansys**

Manufacturing in the Digitalized World

The digital twin, supported by the digital thread, enables greater product innovation

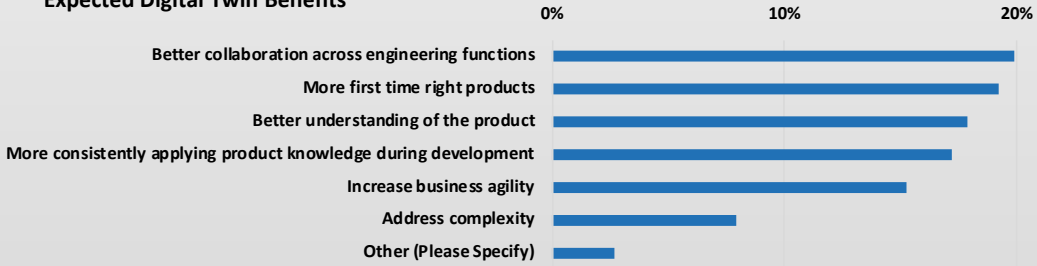
Digital twins and other PLM-enabled solutions can provide significant benefits across the lifecycle. Early applications have shown great promise. Our survey respondents certainly plan to move quickly. While only 11% are in production today and 20% are in pilot, those numbers grow to 34% in production and 43% in pilot in 3 years. And while 22% of respondents said that digital twins are not applicable today, only about 1% see them not applying in 3 years.

There was strong agreement on the benefits from adopting digital twins might yield. Improved collaboration is closely trailed by getting more products right the first time.



Expected Digital Twin Adoption Status in 3 Years

Expected Digital Twin Benefits



Ansys Twin Builder helps build, validate, and deploy complete digital twins

Industrial companies are investing millions of dollars to build, maintain, and track the performance of remotely deployed IoT-enabled assets, machinery, and vehicles. Ansys is working with Microsoft to extend Microsoft® Azure® Digital Twins with Ansys Twin Builder to enable mutual customers to significantly improve operations. The collaboration will empower our joint customers to more accurately predict an asset's future performance and reduce the cost of unscheduled downtime—enabling users to slash product maintenance costs and speed high-quality products to market.

"As industrial companies require comprehensive field data and actionable insights to further optimize deployed asset performance, ecosystem partners must collaborate to form business solutions. Ansys Twin Builder's complementary simulation data stream augments Microsoft Azure IoT Services and greatly enhances their customers' understanding of asset performance."
Eric Bantegnie, Vice President and General Manager, Ansys

See press release:
https://investors.ansys.com/news-and-events/press-releases/2019/04-nov-19-165947628

Augmenting Human Performance

Data gathered across the product lifecycle can yield actionable results

The message of Industry 4.0 and this eBook is that a smart, connected future will bury us in data. Those successful at digital transformation will be the best at using that data to bring knowledge and insight to the point of work.

In the 1980s greenscreen computers offered executive information systems; early dashboards to aid in decision making. Today, there are many solutions available for providing dashboards that mashup data from multiple sources. These are common, for example, in IoT applications where companies want to track and manage their assets. They mashup Google maps data to show geographic location and IoT data to monitor asset status. The range and volume of structured and unstructured data available requires new data management and analytics capabilities. Artificial intelligence (AI), machine learning, and deep learning are being increasingly applied to sift through these mountains of data to find nuggets of insights. Many lifecycle roles can use this field information to help them make better decisions. Leading companies are using these approaches to help move asset maintenance from a scheduling process to predictive maintenance that avoids costly downtime and increases overall equipment effectiveness. There are many examples of companies increasing performance at much lower maintenance cost.

Delivering this information at the point of work is important, particularly for "deskless" workers that spend their time in the field and need information at their fingertips. Advances in virtual reality (VR) have made the technology cheaper and more accessible for large and small companies. Augmented reality (AR) brings virtual insights into focus by overlaying them on the real world. Using AR, machine operators can see vital machine parameters combined with analytics to suggest an optimal plan of action. If maintenance is suggested, they can use AR and VR in combination to provide 3D work instructions on how best to proceed.

What excites the product development world is smart, connected products working in concert with the digital thread and multiple digital twins. Issues in the field can be traced back upstream in the lifecycle, replaying the decisions and actions that led to that product outcome. Data collected from digital twins of both the product and manufacturing process can be compared with field data to ensure that things are operating normally and according to plan. All the while the digital thread can be enhanced with the collective learning across all of these actions, ensuring that future product generations will better meet customer expectations for quality, reliability, functionality, and cost. Perhaps data is, as some say, the new oil, smoothing the way for augmented intelligence to make humans—and the products and services they design, manufacture, and deploy—the best that they can be.

Based on our survey respondents, analytics and dashboards are "used" or "routinely used" at 45% and 44% respectively. Of course, the most widely used analytics tool is Excel (25%) with technologies like augmented reality (16%), machine learning (21%), and deep learning (13%). If the respondents are representative of the broader population there is clearly still a lot of work to do.

"Advanced simulation can help generate the data needed for deep learning. For self-driving cars, for example, simulation helps generate the many possible scenarios that a vehicle might encounter. AI connects physics with data to reimagine and amplify simulation. Advances in IoT and connectedness will revolutionize engineering design, as the use of AR/VR with simulation more closely links the physical and digital worlds. Ansys and its academic and startup partners continue to deliver technological advances that favorably impact simulation-led engineering outcomes." **Prith Banerjee, CTO, Ansys**

Taking the Next Step

The question is not *if* you will digitally transform your business…do you want to drive or be a passenger along for the ride?

This smart connected future is increasingly here today and soon will be table stakes to get into the market. There are a lot of technologies and process changes to consider. As well as: Where are you on your digital transformation journey? Just starting? Hip deep? No plans?

Beginning Your Journey

How does a company get started? "A journey of a thousand miles begins with a single step," or so goes the Chinese proverb. But what is that first step? "If you don't know where you've come from, you don't know where you are going," said Maya Angelou, the former Poet Laureate of the United States. That first step is to understand where you have been and where you are today. The world is a brownfield, with many existing processes, roles, and technologies already in place. Understanding this can be an important first step, as long as it does not paralyze the firm, keeping it from taking the next step. You must learn from the past and present to avoid repeating it—not to be stuck in place by it.

If your's is a manufacturing company, how is your PLM game? How long have your current systems been in place and how are they used? Are you still struggling with MCAD data management, change management, and bills of materials? Or has your firm mastered them and moved on to the more advanced topics needed to get to this smart, connected future? As we have emphasized throughout this eBook, a strong PLM foundation is essential to your digital transformation.

Thriving in a Smart Connected World

Are your products smart and connected? Companies developing complex electro-mechanical devices animated by electronics and software often have siloed development processes that can struggle to operate at the clock speeds needed in today's competitive global markets. Understanding your current development process is an important step toward improving it. What about your IoT journey? If your products are smart and connected, what about the shop floor? Are you gathering the manufacturing data necessary to power digital twins of the process so that you can improve them? Once the products are fielded, how do you track them? Depending on your market you might just want to track use. But many companies sell assets that need to be managed and maintained through their useful life and count on parts and service for significant revenues. As discussed in this eBook, there are many technologies available to help manage the as-maintained bill of material and improve maintenance actions while reducing cost and improving operational effectiveness. As companies try to move from selling or leasing products to offering products-as-a-service, uptime and service efficiency are even more crucial than ever before.

The intent of this eBook, and the supporting research, is to build understanding of where industrial firms are and to provide some clarity on terms and technologies that can help companies move forward. While it is easy to get dazzled by new solutions, as always making significant changes boils down to systematically dealing with people, process, AND technology changes. Where to start differs for every company but CIMdata believes that no matter the choice it is important to plan big (and strategically), start small (on focused changes with measurable outcomes), and to build on each success to help move the organization forward.

Time to Get Started

CIMdata's research shows that about 14% of digital transformation (DT) initiatives are not connected to the respondents PLM strategy. In 21%, PLM is driving DT. If you are a product company pursuing a digital transformation strategy, your PLM strategy and implementation emphasizing simulation–driven design must be strong at the core to achieve your transformation vision and objectives.

—Stan Przybylinski, Vice President, CIMdata, Inc.

Ansys Platform

Connecting simulation and optimization to the business of engineering

Ansys offers best-of-breed simulation across all major physics.

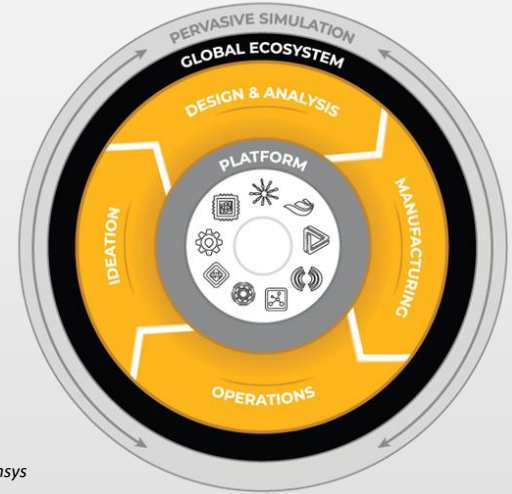


Image courtesy of Ansys

https://www.ansys.com/products/platform

Digital transformation + hybrid cloud approach for next-generation innovation

We are witnessing an evolution in our customers' needs around computing resources and data storage. Enterprises must now balance their computing and application stacks between the public cloud and private data centers. For example, some applications may have significant latency or privacy needs, and would be well-suited for processing in private data centers. Others, such as massive design exploration studies and autonomous system simulations that are compute-intensive, are better served by cloud/multi-cloud computing. A hybrid cloud solution solves these mixed-use needs and facilitates the execution of increasingly complex simulation workflows.

"Ansys' hybrid cloud approach supports customers with scalable solutions that fit with their cloud adoption needs. For example, Ansys Cloud (SaaS) provides users with seamless direct cloud access to Ansys flagship products, such as Ansys Mechanical, Ansys Fluent, and Ansys Electronics Desktop. It also offers flexible licensing with Ansys Elastic Units and BYOL support. Using platform solutions like Ansys Minerva that support this hybrid model, customers are ensured success as they architect the right IT strategy."

Navin Budhiraja, VP and GM, Cloud and Platform, Ansys

CIMdata® | Global Leaders in PLM Consulting
www.CIMdata.com