

# 2017 Annual Report





*“The future is brighter and stronger for ANSYS than at any time in our storied history. With the power of Pervasive Simulation, we can impact virtually every industry – virtually every person – by helping to create the most innovative products on the planet.”*

**Ajei S. Gopal**  
President & CEO

**Dear ANSYS Stockholders,**

More than \$1 billion in revenue.

Double-digit organic growth.

Industry-leading margins.

Addition to the S&P 500.

2017 was a quite a year for ANSYS, but I firmly believe we’ve only scratched the surface of what we can accomplish; our best days still lie ahead of us.

**OUR PERFORMANCE IN 2017:**

**Progress and Renewed Focus**

In 2017, ANSYS achieved record revenues and earnings per share. We maintained our disciplined capital management strategy and invested in growing our business organically and through acquisitions – all while continuing to return capital to stockholders. We consistently demonstrated our commitment to innovation, customer satisfaction, financial discipline and creating stockholder value.

In every department, we made improvements to the business, driving top-line and bottom-line results:

- We closed 2017 with \$1.1 billion in revenue, representing 10.5% constant currency growth over 2016. We added more than 2,000 new customers to our already industry-leading array of clients, which spans virtually every industry around the world, and further strengthened our relationships with long-time customers. In Q3,

we closed the largest deal in our history – over \$45 million.

- We continued to return capital to stockholders through our share repurchase program, repurchasing 2.8 million shares in 2017 for a total cost of \$336.0 million at an average price of \$122.20 per share.
- Our technical support teams continued to earn our customers’ trust, spending 40% more time with our key accounts – and seeing satisfaction levels increase.
- Our channel partners grew their new business by more than 20% while increasing customer satisfaction scores by more than 10%.
- We delivered technological innovation after innovation, including ANSYS 18 with breakthroughs in topology optimization, RedHawk-SC for the semiconductor industry, and ANSYS Discovery Live, which provides instantaneous simulation, tightly coupled with direct geometry modeling, to enable interactive design exploration and rapid product innovation. Discovery Live is an interactive experience in which design engineers in the front-end of product development can manipulate geometry, materials and physics, and instantaneously see 3-D results. This revolutionary new product has the potential to transform the entire product development process.
- We also broadened and deepened our product offerings through acquisitions, starting with

CLK Design Automation, which is providing semiconductor customers with improved accuracy as they develop next-generation chips. Our visualization capabilities took a quantum leap forward with the acquisition of Computational Engineering International (CEI). And we are redefining how companies can take advantage of additive manufacturing through our purchase of 3DSIM and its powerful simulation software for metal additive manufacturing.

- We also created new partnerships, including one with Synopsis, which will further spark innovation across industries.
- And we've added to our ranks – more than 160 experts in simulation, IT, marketing, sales, finance, legal and human resources.

Those investments made for dramatic improvements in 2017 – and have laid the foundation for even more success in 2018 and beyond.

### **The OPPORTUNITIES IN 2018 AND BEYOND**

We will build on 2017's momentum by taking advantage of the monumental shift in the way products are developed, manufactured and operated. This is a once-in-a-lifetime opportunity – one that is ours for the taking.

Companies need to transform the way they do business. They know they need to develop their products differently if they are going to thrive – and they know that simulation can be the difference-maker. ANSYS will seize on this opportunity and make our customers more successful than ever. That will propel our growth to the next \$1 billion and beyond.

The digital revolution – the merger of the physical and digital worlds – is amplifying the challenges manufacturers face. Even the most basic products are becoming smarter. More than half of the material in cars will soon be electronics. Manufacturers can now consider advanced composite material in their designs. The internet of things is changing the way products are being delivered and maintained. While the challenges are formidable, the financial benefits are staggering – to the tune of \$11 trillion in incremental GDP over the next seven years, according to analysts at the Boston Consulting Group. We believe

that a disproportionate share of that incremental financial benefit will go to organizations that can help tame the complexity inherent in this new world. ANSYS can help organizations do just that.

Using ANSYS simulation, customers have always been able to get instant feedback on their products before manufacturing them. They can build products faster and at lower costs. Simulation enables them to consider millions of design options with real-world accuracy so they can heighten quality. With simulation they can manage risk and spur innovation, and seize the vast opportunities in front of them.

But ANSYS can do even more. We will make simulation pervasive. Simulation will become an imperative for manufacturers of every size and products of all complexities – from the simplest to the most sophisticated.

Simulation will move beyond its historical use case as a tool employed only in the prototyping, validation, and testing phases of the product development lifecycle. In the future, customers will take advantage of simulation “upstream,” in the ideation phase, where they can evaluate countless ideas before decisions and costs are locked in.

Simulation will also be used “downstream.” While simulation has been used to build machine tools for manufacturing, it will now be used to enable next-generation manufacturing techniques like 3D printing. And smart companies will also employ simulation in operations for predictive maintenance and proactive response when used in a digital twin. Ultimately, simulation capabilities will be built directly into the smart products of the future.

As simulation expands to be pervasive across the product lifecycle, every engineer – from designers to analysts to operators – will be able to take advantage of our market-leading solutions. And as the usage of simulation grows, ANSYS benefits.

### **Robust Strategy and Flawless Execution**

Our journey to a successful 2018 is based on robust strategy and flawless execution. Early last year, we commissioned a third party to conduct independent interviews with more than 300 of our customers around the world. Customers were asked

about their requirements, their opinions of ANSYS and how ANSYS could benefit them in the future. From there, we developed a comprehensive strategy that will act as a map for our future journey.

That strategy consists of:

- **Reinforcing and extending our leadership in the core business** – Customers see ANSYS as the unquestioned leader in simulation and they expect us to continue to improve our flagship solutions so they can drive innovation. We will continue to support their core use cases, but we are also expanding them to support emerging initiatives like autonomous vehicles and smart connected products. For nearly half a century, our core products have been the foundation for our success – and they will continue to be our growth engine into the future.
- **Investing in select priority adjacencies** – We will extend our core business to include solutions to help customers address new challenges in the marketplace. We are developing products for digital exploration, additive manufacturing, and digital twins.
- **Driving acquisitions and partnerships in line with strategic objectives** – We are not alone in our journey to deliver value to our customers. We have a vast ecosystem that extends our technology reach and brings simulation beyond our traditional audiences and applications. We are working with more than 200 technology partners around the world to help us make our vision a reality. We will also continue to look for other technologies that we can acquire and quickly integrate into our portfolio.
- **Investing in the infrastructure, capabilities and enablers required to support a multibillion dollar business** – Our Company has grown considerably in the last several years, but our infrastructure has not always kept pace. We need to constantly evaluate our processes and make key investments in our tools and systems.
- **Fostering a winning culture focused on customer success** – The most thought-out strategy in the business world will not help us achieve our goals if we are not living the right culture. That starts

with a laser focus on our customers and their success. They are, after all, why we are here. We will continue to deliver to our customers the best, most advanced simulation solutions in the industry to ensure that they are developing the most innovative products on the market.

I am confident that following this path will lead to even greater success in the future. I know we have the right strategy, the right team and the right solutions to get us there.

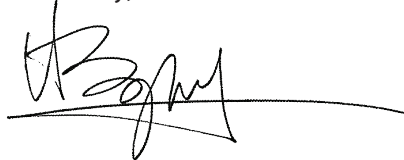
### **The Road Ahead**

2017 was truly an amazing year, full of challenges and milestones. The future is brighter and stronger for ANSYS than at any time in our storied history. As simulation becomes pervasive, we can impact virtually every industry – virtually every person – by helping to create the most innovative products on the planet.

We like to say that we help companies make everything better – from potato chips to rocket ships. And it's true. We are helping to make an athlete's lifelong dream come true by winning gold using skis designed with ANSYS software. We are giving hope to people with cardiac disease through an artificial heart pump built with ANSYS technology. We are helping to save lives lost to automobile accidents through the development of truly autonomous vehicles.

Not many companies can say that. Not many people go home from work every day knowing they made a difference. Not many companies can truly say they are helping to change the world. But ANSYS can. And we do – each and every day.

Sincerely,



Ajei S. Gopal  
President & CEO

## CORPORATE INFORMATION



### Stockholder Information

Requests for information about the Company should be directed to:  
Investor Relations  
ANSYS, Inc.  
Southpointe  
2600 ANSYS Drive  
Canonsburg, PA 15317  
U.S.A.  
Telephone: 724.820.3700



### Transfer Agent and Registrar

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Telephone: 1.866.267.9724 or  
724.746.3304

www.ansys.com

### About ANSYS, Inc.

ANSYS, Inc., headquartered in Canonsburg, Pennsylvania, U.S.A., is committed to innovation by improving the way our customers design and develop products through Simulation-Driven Product Development.™ Whether developing innovative performance modeling and simulation technologies, working with customers to understand their needs, or delivering a successful solution implementation at a customer site, ANSYS brings over four decades of experience, talent and drive to every situation.

Founded in 1970, ANSYS has evolved from a small group of engineers to an international corporation that employs almost 3,000 development, sales, finance, marketing, administrative and management professionals. Dedicated employees and visionary, responsible leadership— together with a large and loyal customer base and a worldwide network of valued partners— have helped ANSYS to create a global and influential engineering simulation community.

Clear vision, sound and consistent strategy, financial stability, and an unwavering focus on engineering simulation have led the Company's growth and success. The Company offers an integrated, full-spectrum portfolio, re-investing a significant percentage of revenue back into research and development. In addition, strategic alliances and acquisitions have helped ANSYS to build capabilities to meet customer needs. Many customers are re-evaluating their development processes and are using engineering simulation to drive innovative product designs, rather than traditional hardware prototyping and testing.

ANSYS looks forward to many more decades of innovations and to developing technologies that will solve tomorrow's complex problems in both mature and emerging industries.

### Forward-Looking Information

The Company cautions investors that its performance is subject to risks and uncertainties. Some matters discussed in this document may constitute forward-looking statements that involve risks and uncertainties that could cause actual results to differ materially from those projected. These risks and uncertainties are discussed at length, and may be amended from time to time, in the Company's Annual Report to Stockholders and filings with the SEC, including our most recent filings on Forms 10-K and 10-Q. We undertake no obligation to publicly revise any forward-looking statements, whether changes occur as a result of a new information update or for future events, after the date they were made.

ANSYS, Inc. is an Equal Opportunity/Affirmative Action Employer. It is the Company's policy to provide equal employment opportunity to employees and applicants for employment and to prohibit discrimination on the basis of, among other protected categories, race, color, religion, sex, age, national origin, veteran status or being a qualified individual with a disability in all aspects of employment including recruiting, hiring, training or promoting personnel.

ANSYS and any and all ANSYS, Inc., brand, product, service and feature names, logos and slogans are registered trademarks or trademarks of ANSYS, Inc., or its subsidiaries in the United States or other countries. All other brand, product, service, and feature names or trademarks are the property of their respective owners.

**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, D.C. 20549  
FORM 10-K**

(Mark One)

**ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2017

OR

**TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

Commission File Number 0-20853

**ANSYS, Inc.**

(Exact name of registrant as specified in its charter)

**Delaware**

(State or other jurisdiction of incorporation or organization)

**2600 ANSYS Drive, Canonsburg, PA**

(Address of principal executive offices)

**04-3219960**

(I.R.S. Employer Identification No.)

**15317**

(Zip Code)

**844-462-6797**

(Registrant's telephone number, including area code)

**Securities registered pursuant to Section 12(b) of the Act:**

**Common Stock, \$0.01 par value per share**

(Title of each class)

**The NASDAQ Stock Market, LLC**

(Name of exchange on which registered)

**Securities registered pursuant to Section 12(g) of the Act:**

**None**

(Title of class)

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes  No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. Yes  No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes  No

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate website, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes  No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein and will not be contained, to the best of the Registrant's knowledge, in definitive proxy or information statements incorporated by reference in PART III of this Form 10-K, or any amendment to this Form 10-K.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company (as defined in Exchange Act Rule 12b-2). (Check one):

Large accelerated filer

Accelerated filer

Non-accelerated filer

Smaller reporting company

Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Indicate by check mark whether the registrant is a shell company (as defined in Exchange Act Rule 12b-2). Yes  No

The aggregate market value of the voting stock held by non-affiliates of the Registrant, based upon the closing sale price of the Common Stock on June 30, 2017 as reported on the NASDAQ Global Select Market, was \$7,251,000,000. Shares of Common Stock held by each officer and director, and each shareholder who owns 5% or more of the outstanding Common Stock have been excluded in that such shareholders may be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

The number of shares of the Registrant's Common Stock, par value \$.01 per share, outstanding as of February 16, 2018 was 83,871,362 shares.

**Documents Incorporated by Reference:**

Portions of the Proxy Statement for the Registrant's 2018 Annual Meeting of Stockholders are incorporated by reference into Part III.

**ANSYS, Inc.**  
**ANNUAL REPORT ON FORM 10-K FOR FISCAL YEAR 2017**  
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## **Important Factors Regarding Future Results**

Information provided by ANSYS, Inc. (hereafter the Company or ANSYS), in this Annual Report on Form 10-K, may contain forward-looking statements concerning such matters as projected financial performance, market and industry segment growth, product development and commercialization, acquisitions or other aspects of future operations. Such statements, made pursuant to the safe harbor established by the securities laws, are based on the assumptions and expectations of the Company's management at the time such statements are made. The Company cautions investors that its performance (and, therefore, any forward-looking statement) is subject to risks and uncertainties. Various important factors including, but not limited to, those discussed in Item 1A. Risk Factors, may cause the Company's future results to differ materially from those projected in any forward-looking statement. All information presented is as of December 31, 2017, unless otherwise indicated.

## **PART I**

### **ITEM 1. BUSINESS**

ANSYS, a Delaware corporation formed in 1994, develops and globally markets engineering simulation software and services widely used by engineers, designers, researchers and students across a broad spectrum of industries and academia, including aerospace and defense, automotive, electronics, semiconductors, energy, materials and chemical processing, turbomachinery, consumer products, healthcare, and sports. Headquartered south of Pittsburgh, Pennsylvania, the Company and its subsidiaries employed approximately 2,900 people as of December 31, 2017. The Company focuses on the development of open and flexible solutions that enable users to analyze designs directly on the desktop, providing a common platform for fast, efficient and cost-conscious product development, from design concept to final-stage testing and validation. The Company distributes its ANSYS<sup>®</sup> suite of simulation technologies through a global network of independent resellers and distributors (collectively, channel partners) and direct sales offices in strategic, global locations. It is the Company's intention to continue to maintain this hybrid sales and distribution model.

The Company's product portfolio consists of the following:

#### **Simulation Platform: ANSYS Workbench™**

ANSYS Workbench is the framework upon which the Company's suite of advanced engineering simulation technologies is built. The innovative project schematic view ties together the entire simulation process, guiding the user through complex multiphysics analyses with drag-and-drop simplicity. With bi-directional computer-aided design (CAD) connectivity, powerful highly-automated meshing, a project-level update mechanism, pervasive parameter management and integrated optimization tools, the ANSYS Workbench platform enables Pervasive Engineering Simulation™.

The Company's Workbench framework allows engineers and designers to incorporate the compounding effects of multiple physics into a virtual prototype of their design and simulate its operation under real-world conditions. As product architectures become smaller, lighter and more complex, companies must be able to accurately predict how products will behave in real-world environments where multiple types of physics interact in a coupled way. ANSYS multiphysics software enables engineers to simulate the interactions between structures, heat transfer, fluids and electronics all within a single, unified engineering simulation environment.

#### **Structures**

The Company's structural analysis product suite offers simulation tools for product design and optimization that increase productivity, minimize physical prototyping and help to deliver better and more innovative products in less time. These tools tackle real-world analysis problems by making product development less costly and more reliable. In addition, these tools have capabilities that cover a broad range of analysis types, elements, contacts, materials, equation solvers and coupled physics capabilities, all targeted toward understanding and solving complex design problems.

#### **Fluids**

The Company's fluids product suite enables modeling of fluid flow and other related physical phenomena. Fluid flow analysis capabilities provide all the tools needed to design and optimize new fluids equipment and to troubleshoot already existing installations. The suite contains general-purpose computational fluid dynamics software and specialized products to address specific industry applications.



## **Electronics**

The Company's electronics product suite provides field simulation software for designing high-performance electronic and electromechanical products. The software streamlines the design process and predicts performance of mobile communication and internet-access devices, broadband networking components and systems, integrated circuits (ICs) and printed circuit boards (PCBs), as well as electromechanical systems such as automotive components and power electronics equipment, all prior to building a prototype.

## **Semiconductors**

Advancements in semiconductor design and manufacturing enable smaller electronic architectures. Shrinking geometries, especially in the emerging 3D IC, FinFET and stacked-die architectures, reveal design challenges related to power and reliability. The Company's power analysis and optimization software suite manages the power budget, power delivery integrity and power-induced noise in an electronic design, from initial prototyping to system sign-off. These solutions deliver accuracy with correlation to silicon measurement; the capacity to handle an entire electronic system, including IC, package and PCB, efficiently for ease-of-debug and fast turnaround time; and comprehensiveness to facilitate cross-domain communications and electronic ecosystem enablement.

## **Embedded Software**

The Company's SCADÉ<sup>®</sup> product suite is a comprehensive solution for embedded software simulation, code production and automated certification. It has been developed specifically for use in critical systems with high dependability requirements, including aerospace, rail transportation, nuclear, industrial and, more recently, automotive applications. SCADÉ software supports the entire development workflow, from requirements analysis and design, through verification, implementation and deployment. SCADÉ solutions easily integrate with each other and the rest of the ANSYS product suite, allowing for development optimization and increased communication among team members.

## **Systems**

The Company delivers a unique and comprehensive system simulation capability that is ideal for the design of today's increasingly automated products. This collaborative environment leverages the Company's multiphysics, multibody dynamics, circuit and embedded software simulation capabilities, enabling users to simulate the complex interactions between components, circuits and control software within a single environment. These technologies provide a complete view into predicted product performance, which creates greater design confidence for engineers.

## **High-Performance Computing**

The Company's high-performance computing (HPC) product suite enables enhanced insight into product performance and improves the productivity of the design process. The HPC product suite delivers cross-physics parallel processing capabilities for the full spectrum of the Company's simulation software by supporting structures, fluids, thermal and electronics simulations. This product suite decreases turnaround time for individual simulations, allowing users to consider multiple design ideas and make the right design decisions early in the design cycle.

## **3-D Design**

The Company's Discovery<sup>™</sup> product family allows every engineer to benefit from the insight of simulation in their product design. The Discovery products range from early design exploration tools powered by interactive real-time simulation and intuitive geometry editing, to detailed product validation solutions utilizing proven flagship solver technology with easy-to-use guided workflows. These tools allow for design engineers of all levels of expertise to utilize simulation across the entire product design process and to work seamlessly with simulation experts using ANSYS flagship products for even more advanced analysis.

## **Customization**

ANSYS Workbench enables companies to create a customized simulation environment to deploy specialized simulation best practices and automations unique to their product development process or industry. With ANSYS ACT<sup>™</sup>, end users or ANSYS partners can modify the user interface, process simulation data or embed third-party applications to create specialized tools based on ANSYS Workbench.

## Academic

The Company's academic product suite provides a highly scalable portfolio of academic products based on several usage tiers, including associate, research and teaching. Each tier includes various noncommercial products that bundle a broad range of physics and advanced coupled field solver capabilities. The academic product suite provides entry-level tools intended for class demonstrations and hands-on instruction. It includes flexible terms of use and more complex analysis suitable for doctoral and post-doctoral research projects. The Company also provides a special product at no cost to students that is suitable for use away from the classroom and in non-commercial applications.

## PRODUCT DEVELOPMENT

The Company makes significant investments in research and development and emphasizes frequent, integrated product releases. The Company's product development strategy centers on ongoing development and innovation of new technologies to increase productivity and to provide engineering simulation solutions that customers can integrate into enterprise-wide product lifecycle management (PLM) systems. The Company's product development efforts focus on extensions of the full product line with new functional modules, further integration with CAD, electronic CAD (ECAD) and PLM products, and the development of new products. The Company's products run on the most widely-used engineering computing platforms and operating systems, including Windows, Linux and most UNIX workstations.

The Company completed the following major product development activities and releases:

- In January 2018, the Company announced the release of ANSYS 19, which enables customers to leverage simulation to solve the most complex problems with greater accuracy, reduced costs, less time and less complexity. ANSYS 19 delivers major enhancements across the entire industry-leading product portfolio. ANSYS 19 includes new support for AADL-compatible avionics system modeling, which not only empowers organizations to understand and control their system costs, but also maximizes critical performance characteristics. In the electromagnetics suite, ANSYS 19 introduces technology that is ideal for engineers designing autonomous vehicles, advanced detection systems and stealth technology. ANSYS 19 delivers a robust, integrated electromagnetic-thermal workflow that predicts crucial thermal effects within electronics designs. ANSYS medini analyze™ is new to the systems suite and available for functional safety analysis in applications for automotive, aerospace and defense, rail, nuclear and other safety-critical industries. ANSYS 19 for semiconductors provides comprehensive simulation solutions that simultaneously solve for various design attributes such as power noise, thermal properties, reliability and performance across the spectrum of chip, package and system. New functionalities are provided in the fluids suite that significantly reduce the computational effort needed for spray nozzle designers to optimize product performance. In the mechanical and electromagnetic suites, ANSYS 19 increases the number of built-in HPC cores from two to four. In the 3-D design suite, ANSYS 19 enables engineers to produce lighter-weight, stronger designs in shorter time through enhancements in topology optimization.
- In August 2017, ANSYS 18.2 was released with new functionality across physics, system simulation and embedded software. For electronics, ANSYS HFSS 18.2 delivered significant meshing and computation speed plus advances in visualization for high-frequency electromagnetic field simulation. Structural analysis was enhanced with topology optimization built in to ANSYS Mechanical™. Modal and harmonic acoustic analysis was integrated natively in Mechanical, and an integrated wizard to rapidly set up drop tests was added. Enhancements to Mechanical's HPC performance were released that allow simulations to continue increasing speed beyond 3,000 cores. Patented polyhedral unstructured mesh adaptation was added to ANSYS Fluent® to automatically refine the mesh to resolve fine details, providing accuracy with speed. Enhancements to cavitation analysis for multiple fluids and non-condensing gases were added to help pump designers. The adjoint solver was enhanced to enable engineers to optimize a greatly expanded range of problems, including rotating machinery and heat exchangers. AIM® 18.2 supports topology optimization providing shapes otherwise too complex to envision, with several prototypes for refinement and fine tuning of results.

- In May 2017, the Company announced the release of ANSYS 18.1, which featured enhancements to the electronics, semiconductor, structures and fluids product lines. In the fluids suite, ANSYS 18.1 enabled users to simulate more quickly and accurately. ANSYS 18.1 also provided improvements to workflow and meshing, enabling users to quickly become productive while providing new opportunities for experienced users. In the structures suite, ANSYS 18.1 added new capabilities within its topology optimization technology to analyze complex materials and optimize designs. ANSYS 18.1 expanded its noise-vibration-harshness (NVH) analysis to include both magnetostriction and induced magnetostriction effects in electrical machines and transformers. Also, ANSYS 18.1 introduced a new characteristic mode analysis solver for electronics designers to study antenna placement on large platforms such as aircraft and ships. ANSYS AIM further expanded the landscape for digital exploration in ANSYS 18.1 with enhancements across all physics. ANSYS SpaceClaim<sup>®</sup> continues to build upon its powerful optimization tools for additive manufacturing in ANSYS 18.1.

## **New Product Offerings**

### *Discovery Product Suite*

ANSYS released the Discovery line of products in ANSYS 19.0, including the groundbreaking Discovery Live. Discovery Live provides instantaneous simulation tightly coupled with direct geometry modeling. This enables interactive design exploration and rapid product innovation.

### *Additive Manufacturing*

ANSYS recently acquired 3DSIM, a developer of premier additive manufacturing simulation technology. The acquisition of 3DSIM gives ANSYS 19.0 the industry's only complete design-to-print additive manufacturing simulation workflow.

### *CEI EnSight*

ANSYS recently acquired Computational Engineering International (CEI) and the EnSight simulation visualization software tool. EnSight can be used by enterprises to better understand the results of their simulation data by allowing engineers to combine analysis results to see multiple outputs or multiple physics.

The Company's total research and development expenses were \$202.7 million, \$183.1 million and \$168.8 million in 2017, 2016 and 2015, respectively, or 18.5%, 18.5% and 17.9% of total revenue, respectively. As of December 31, 2017, the Company's product development staff consisted of approximately 1,000 employees, most of whom hold advanced degrees and have industry experience in engineering, mathematics, computer science or related disciplines. The Company has traditionally invested significant resources in research and development activities and intends to continue to make investments in expanding the ease of use and capabilities of its broad portfolio of simulation software products.

## **PRODUCT QUALITY**

The Company's employees generally perform product development tasks according to predefined quality plans, procedures and work instructions. Certain technical support tasks are also subject to a quality process. These plans define, for each project, the methods to be used, the responsibilities of project participants and the quality objectives to be met. The majority of software products are developed under a quality system that is certified to the ISO 9001:2008 standard. The Company establishes quality plans for its products and services, and subjects product designs to multiple levels of testing and verification in accordance with processes established under the Company's quality system.

## **SALES AND MARKETING**

The Company distributes and supports its products through a global network of independent channel partners, as well as through its own direct sales offices. This channel partner network provides the Company with a cost-effective, highly-specialized channel of distribution and technical support. It also enables the Company to draw on business and technical expertise from a global network, provides relative stability to the Company's operations to offset geography-specific economic trends and provides the Company with an opportunity to take advantage of new geographic markets. The Company derived 24.8%, 24.4% and 24.2% of its total revenue through the indirect sales channel for the years ended December 31, 2017, 2016 and 2015, respectively.

The channel partners sell ANSYS products to new customers, expand installations within the existing customer base, offer training and consulting services, and provide the first line of ANSYS technical support. The Company's channel partner certification process helps to ensure that each channel partner has the ongoing capability to adequately represent the Company's expanding product lines and to provide an acceptable level of training, consultation and customer support.

The Company also has a direct sales organization to develop an enterprise-wide, focused sales approach and to implement a worldwide major account strategy. The sales management organization also functions as a focal point for requests to ANSYS from the channel partners and provides additional support in strategic locations through the presence of direct sales offices.

During 2017, the Company continued to invest in its existing domestic and international strategic sales offices. In total, the Company's direct sales organization comprises 1,400 employees who are responsible for the sales, technical support, consulting services, marketing initiatives and administrative activities designed to support the Company's overall revenue growth and expansion strategies.

The Company's products are utilized by organizations ranging in size from small consulting firms to the world's largest industrial companies. No single customer accounted for more than 5% of the Company's revenue in 2017, 2016 or 2015.

Information with respect to foreign and domestic revenue may be found in Note 16 to the consolidated financial statements in Part IV, Item 15 of this Annual Report on Form 10-K and in the section entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations" in Part II, Item 7 of this Annual Report on Form 10-K.

## **STRATEGIC ALLIANCES AND MARKETING RELATIONSHIPS**

The Company has established and continues to pursue strategic alliances with advanced technology suppliers, hardware vendors, specialized application developers, and CAD, ECAD and PLM providers. The Company believes that these relationships facilitate accelerated incorporation of advanced technology into the Company's products, provide access to new customers, expand the Company's sales channels, develop specialized product applications and provide direct integration with leading CAD, electronic design automation (EDA), product data management and PLM systems.

The Company has technical and marketing relationships with leading CAD vendors, such as Autodesk, PTC and Siemens Product Lifecycle Management Software, to provide direct links between products. These links facilitate the transfer of electronic data models between the CAD systems and ANSYS products.

Similarly, the Company maintains marketing and software development relationships with leading EDA software companies, including Cadence Design Systems, Synopsys, Mentor Graphics, Zuken and National Instruments. These relationships support the transfer of data between electronics design and layout software and the ANSYS electronics simulation portfolio. In 2017, the Company entered into an integration and distribution agreement with Synopsys to cooperatively integrate ANSYS RedHawk technology into an in-design add-on to a Synopsys design tool for the primary purpose of providing customers with direct, in-design access to the RedHawk technology's capabilities.

The Company also has a relationship with Spatial Corp. to provide the 3-D modeling kernel technology upon which the Company's in-house geometry modeling software solutions are built.

The main method that ANSYS employs to democratize HPC to a wider audience is through partnerships with a number of companies, such as cloud-hosting providers, HPC hardware manufacturers and supercomputing centers such as HLRS in Stuttgart, Germany. The cloud partners not only provide HPC services, but also the back-end infrastructure to those customers who lack the in-house HPC or IT staff, but still want the ability to increase computational resources quickly. In addition, ANSYS has established partnerships with HPC partners that provide appliances, or pre-configured racks of computational hardware optimized and configured to run ANSYS software. In 2017, ANSYS, Saudi Aramco and King Abdullah University of Science & Technology (KAUST) in Saudi Arabia announced that they had set a new supercomputing milestone by scaling ANSYS Fluent to nearly 200,000 processor cores. This supercomputing record represents a more than five-fold increase over the record set just three years ago when Fluent first reached the 36,000-core scaling milestone.

The Company's open cloud strategy allows it to work with various public cloud providers and cloud hosting partners. This approach makes it easy for customers to use the same workflows on-premise and in the Cloud. In addition, the Company strengthened its other cloud-hosting service partnerships by further improving best practices for executing engineering simulation in the Cloud. Cloud-hosting partners such as Nimble, Rescale and Gcompute provide friction-free cloud access to ANSYS solutions for customers. Furthermore, the Company enjoys mutually-committed alliances with large cloud platform providers such as Microsoft and AWS.

The Company's Partner Program actively encourages specialized developers of software solutions to use the Company's technology as a development platform for their applications and provides customers with enhanced functionality related to their use of the Company's software. With almost 200 active solution partnerships, spanning a wide range of technologies, including optimization, electronics, mechanical simulation, fluid simulation and CAD, this partner ecosystem extends the depth and breadth of the Company's technology offerings.

The Company has a software license agreement with Livermore Software Technology Corporation (LSTC) whereby LSTC has provided LS-DYNA<sup>®</sup> software for explicit dynamics solutions used in applications such as crash test simulations in automotive and other industries. Under this arrangement, LSTC assists in the integration of the LS-DYNA software with the Company's pre- and post-processing capabilities and provides updates and problem resolution in return for royalties from sales of the ANSYS LS-DYNA<sup>®</sup> combined product.

The Company has a software license agreement with HBM that provides the advanced fatigue capabilities of nCode DesignLife™, a leading durability software from HBM. ANSYS nCode DesignLife™ technology leverages the open architecture of the ANSYS platform and enables mechanical engineers to more easily address complex product life and durability issues before a prototype is built.

## **COMPETITION**

The Company believes that the principal factors affecting sales of its software include ease of use, breadth and depth of functionality, flexibility, quality, ease of integration with other software systems, file compatibility across computer platforms, range of supported computer platforms, performance, price and total cost of ownership, customer service and support, company reputation and financial viability, and effectiveness of sales and marketing efforts.

The Company continues to experience competition across all markets for its products and services. Some of the Company's current and possible future competitors have greater financial, technical, marketing and other resources than the Company, and some have well-established relationships with current and potential customers of the Company. The Company's current and possible future competitors also include firms that have elected, or may in the future elect, to compete by means of open source licensing. These competitive pressures may result in decreased sales volumes, price reductions and/or increased operating costs, and could result in lower revenues, margins and net income.

## **PROPRIETARY RIGHTS AND LICENSES**

The Company regards its software as proprietary and relies on a combination of trade secret, copyright, patent and trademark laws, license agreements, nondisclosure and other contractual provisions, and technical measures to protect its proprietary rights in its products. The Company distributes its software products under software license agreements that grant customers nonexclusive licenses, which are typically nontransferable, for the use of the Company's products. License agreements for the Company's products are directly between the Company and end users. Use of the licensed software product is restricted to specified sites unless the customer obtains a multi-site license for its use of the software product or the software product is by its nature a multi-site use product. Software security measures are also employed to prevent unauthorized use of the Company's software products and the licensed software is subject to terms and conditions prohibiting unauthorized reproduction. For most products, customers may purchase a perpetual license of the technology with the right to annually purchase ongoing maintenance, technical support and upgrades, or may lease the product on a fixed-term basis for a fee that includes the license, maintenance, technical support and upgrades. For its Discovery products, customers purchase an annual subscription for a certain number of named users that includes the license, maintenance, technical support and upgrades.

The Company licenses its software products utilizing a combination of web-based and hard-copy license terms and forms. For certain software products, the Company primarily relies on "click-wrapped" licenses. The enforceability of these types of agreements under the laws of some jurisdictions is uncertain.

The Company also seeks to protect the source code of its software as a trade secret and as unpublished copyrighted work. The Company has obtained federal trademark registration protection for ANSYS and other marks in the U.S. and foreign countries. Additionally, the Company was awarded numerous patents by the U.S. Patent and Trademark Office, and has a number of patent applications pending. To the extent the Company does not choose to seek patent protection for its intellectual property, the Company primarily relies on the protection of its source code as a trade secret.

Employees of the Company have signed agreements under which they have agreed not to disclose trade secrets or confidential information. These agreements, where legally permitted, restrict engagement in or connection with any business that is competitive with the Company anywhere in the world while employed by the Company (and, in some cases, for specified periods thereafter) and state that any products or technology created by employees during their term of employment are the property of the Company. In addition, the Company requires all channel partners to enter into agreements not to disclose the Company's trade secrets and other proprietary information.

Despite these precautions, there can be no assurance that misappropriation of the Company's technology and proprietary information (including source code) will be prevented. Further, there can be no assurance that copyright, trademark, patent and trade secret protection will be available for the Company's products in certain jurisdictions, or that restrictions on the ability of employees and channel partners to engage in activities competitive with the Company will be enforceable. Costly and time-

consuming litigation could be necessary in the future to enforce the Company's rights to its trade secrets and proprietary information or to enforce its patent rights and copyrights, and it is possible that, in the future, the Company's competitors may be able to obtain the Company's trade secrets or to independently develop similar, unpatented technology.

The software development industry is characterized by rapid technological change. Therefore, the Company believes that factors such as the technological and creative skills of its personnel, new product developments, frequent product enhancements, name recognition and reliable product maintenance are also important to establishing and maintaining technology leadership in addition to the various legal protections of its technology that may be available.

The Company does not believe that any of its products infringe upon the proprietary rights of third parties. There can be no assurance, however, that third parties will not claim such infringement by the Company or its licensors or licensees with respect to current or future products. The Company expects that software suppliers will increasingly be subject to the risk of such claims as the number of products and suppliers continues to expand and the functionality of products continues to increase. Any such claims, with or without merit, could be time consuming, result in costly litigation, cause product release delays or require the Company to enter into royalty or licensing agreements. Such royalty or licensing agreements, if required, may not be available on terms acceptable to the Company.

## SEASONAL VARIATIONS

The Company's business has experienced seasonality, including quarterly reductions in software sales resulting from slowdowns of customer activities during the summer months, particularly in Europe, as well as from the seasonal purchasing and budgeting patterns of the Company's global customers. Lease and maintenance contract renewals are typically highest in the first and fourth quarters. The Company's revenue is typically highest in the fourth quarter.

## DEFERRED REVENUE AND BACKLOG

Deferred revenue consists of billings made or payments received in advance of revenue recognition from software license and maintenance agreements. The deferred revenue on the Company's consolidated balance sheets does not represent the total value of annual or multi-year, noncancellable software license and maintenance agreements. The Company's backlog represents installment billings for periods beyond the current quarterly billing cycle and customer orders received but not processed. The Company's deferred revenue and backlog as of December 31, 2017 and 2016 consisted of the following:

	Balance at December 31, 2017		
<i>(in thousands)</i>	Total	Current	Long-Term
Deferred revenue	\$ 468,560	\$ 440,491	\$ 28,069
Backlog	301,150	97,283	203,867
Total	<u>\$ 769,710</u>	<u>\$ 537,774</u>	<u>\$ 231,936</u>

	Balance at December 31, 2016		
<i>(in thousands)</i>	Total	Current	Long-Term
Deferred revenue	\$ 415,846	\$ 403,279	\$ 12,567
Backlog	221,994	64,361	157,633
Total	<u>\$ 637,840</u>	<u>\$ 467,640</u>	<u>\$ 170,200</u>

Revenue associated with deferred revenue and backlog that will be recognized in the subsequent twelve months is classified as current in the table above.

## EMPLOYEES

As of December 31, 2017, the Company employed approximately 2,900 people. At that date, there were also contract personnel and co-op students providing ongoing development services and technical support. Certain employees of the Company are subject to collective bargaining agreements and have local work councils.

## ACQUISITIONS

The Company makes targeted acquisitions in order to support its long-term strategic direction, accelerate innovation, provide increased capabilities to its existing products, supply new products and services, expand its customer base and enhance its distribution channels.

During the years ended December 31, 2017, 2016 and 2015 the Company completed various acquisitions to expand its customer base and accelerate the development of new and innovative products to the marketplace while lowering design and engineering costs for customers. The acquisitions were not individually significant. The combined purchase prices of the acquisitions purchased during the years ended December 31, 2017, 2016 and 2015 were approximately \$67.0 million, \$10.3 million and \$49.7 million, respectively. The 2017 technology acquisitions are further described in the table below:

Date of Closing	Company	Details
November 15, 2017	3DSIM	3DSIM, a developer of premier additive manufacturing technology, gives ANSYS a complete additive manufacturing simulation workflow solution. 3DSIM's software solutions empower manufacturers, designers, materials scientists and engineers to achieve their objectives through simulation-driven innovation rather than physical trial and error.
July 5, 2017	Computational Engineering International, Inc. (CEI Inc.)	CEI Inc., the developer of EnSight, aids engineers and scientists in their ability to analyze, visualize and communicate large simulation data sets in clear, higher-resolution outputs.
March 10, 2017	CLK Design Automation (CLK-DA)	CLK-DA offers fast transistor simulation technology that complements the Company's semiconductor product portfolio.

For further information on the Company's business combinations, see Note 3 to the consolidated financial statements included in Part IV, Item 15 of this Annual Report on Form 10-K.

## AVAILABLE INFORMATION

The Company's website is [www.ansys.com](http://www.ansys.com). The Company also maintains a presence on social media through its various channels included at [www.ansys.com/about-ansys/social-media](http://www.ansys.com/about-ansys/social-media). The Company makes available on its website, free of charge, Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, interactive data files, Current Reports on Form 8-K, reports filed pursuant to Section 16 and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, as soon as reasonably practicable after such materials are electronically filed or furnished to the Securities and Exchange Commission (SEC). The Company's reports may also be obtained by accessing the EDGAR database of the SEC's website at [www.sec.gov](http://www.sec.gov). In addition, the Company has posted the charters for its Audit Committee, Compensation Committee, and Nominating and Corporate Governance Committee, as well as the Company's Code of Business Conduct and Ethics, Standard Business Practices and Corporate Governance Guidelines on its website. Information posted on the Company's website or social media accounts is not incorporated by reference in this Annual Report on Form 10-K.

## ITEM 1A. RISK FACTORS

Information provided by the Company or its spokespersons, including information contained in this Annual Report on Form 10-K, may from time to time contain forward-looking statements concerning projected financial performance, market and industry sector growth, product development and commercialization or other aspects of future operations. Such statements will be based on the assumptions and expectations of the Company's management at the time such statements are made. The Company cautions investors that its performance (and, therefore, any forward-looking statement) is subject to risks and uncertainties. Various important factors, including, but not limited to, the following may cause the Company's future results to differ materially from those projected in any forward-looking statement.

**Global Economic Conditions.** The Company's operations and performance depend significantly on foreign and domestic economic conditions. Uncertainty in the macroeconomic environment, as well as geopolitical conditions, can result in significant volatility in credit, equity and foreign exchange markets. This volatility and the related economic conditions may negatively impact the Company as customers defer spending in response to tighter credit, higher unemployment, financial market volatility, government austerity programs, negative financial news, declining valuations of investments and other factors. In addition, certain of the Company's customers' budgets may be constrained and they may be unable to purchase the Company's products at the same level as they have in prior periods. Customer spending levels may be impacted by decreased government spending in certain countries as concerns continue regarding economic conditions and government debt levels. These economic conditions can change abruptly. To the extent the global economy experiences volatility, the Company may be exposed to impairments of certain assets as their values deteriorate.

Tighter credit due to economic conditions may diminish the Company's future borrowing ability. The Company's customers' ability to pay for the Company's products and services may also be impaired, which may lead to an increase in the Company's allowance for doubtful accounts and write-offs of accounts receivable. Since the Company is exposed to the majority of major world markets, uncertainty in any significant market may negatively impact the Company's performance and results, particularly with respect to the Company's largest geographic customer bases. The Company is unable to predict the likely duration and magnitude of changing economic conditions or the likelihood of additional uncertainty arising in any of the Company's key markets. Adverse economic conditions could negatively impact the Company's operating results, cash flows and financial condition.

***Decline in Customers' Businesses.*** The Company's sales are based significantly on end-user demand for products in key industrial sectors. Many of these sectors periodically experience economic declines, which may be exacerbated by other economic factors. These factors may also adversely affect the Company's business by extending sales cycles and reducing revenue. These economic factors may cause the Company's customers to reduce the size of their workforce or cut back on operations and may lead to a reduction in renewals of licenses or maintenance contracts with the Company. The Company's customers may request discounts or extended payment terms on new products or seek to extend payment terms on existing contracts, all of which may cause fluctuations in the Company's future operating results. The Company may not be able to adjust its operating expenses to offset such fluctuations because a substantial portion of the Company's operating expenses are related to personnel, facilities and marketing programs. The level of personnel and related expenses may not be able to be adjusted quickly and is based, in significant part, on the Company's expectation for future revenue.

***Risks Associated with International Activities.*** A majority of the Company's business comes from outside the United States and the Company has customers that supply a wide spectrum of goods and services in virtually all of the world's major economic regions. If any of the foreign economies in which the Company does business deteriorate or suffer periods of uncertainty, the Company's business and performance may be negatively impacted through reduced customer spending, changes in purchasing cycles or timing, reduced access to credit for its customers, or other factors impacting the Company's international sales and collections. The Company's results may also be negatively impacted by geopolitical tensions, which may result in increased economic volatility.

As a result of its significant international presence, the Company has revenue, expenses, cash, accounts receivable and payment obligations denominated in foreign currencies. As a result, the Company is subject to currency exchange risk. The Company's revenues and operating results are adversely affected when the U.S. Dollar strengthens relative to other currencies and are positively affected when the U.S. Dollar weakens. As a result, changes in currency exchange rates will affect the Company's financial position, results of operations and cash flows. In the event that there are economic declines in countries in which the Company conducts transactions, the resulting changes in currency exchange rates may affect the Company's financial position, results of operations and cash flows. The Company is most impacted by movements in and among the Euro, Japanese Yen, South Korean Won, British Pound, Taiwan Dollar, Indian Rupee and U.S. Dollar. The Company seeks to reduce currency exchange transaction risks primarily through its normal operating and treasury activities, but there can be no assurance that it will be successful in reducing these risks.

In June 2016, the United Kingdom voted to leave the European Union. The long-term impact of the decision is uncertain. As a result, the Company's business in the United Kingdom and Europe could be adversely impacted due to political and economic instability, fluctuations in currency exchange rates, changes in laws and regulations, and other factors. These risks could negatively impact the Company's financial position, results of operations and cash flows.

In May 2018, a new set of data protection rules will go into effect in the European Union. These rules provide a unified and comprehensive set of requirements for data protection of individuals within the European Union. The Company will be subject to these requirements, which include potentially significant monetary penalties for noncompliance. If the Company fails to comply with the new regulations, its reputation may suffer and its financial position, results of operations and cash flows may be negatively impacted.

Additional risks inherent in the Company's international business activities include imposition of government controls; export license requirements; restrictions on the export of critical technology, products and services; the violation of anti-corruption laws and regulations, which are applicable to the Company, by third parties in countries where such conduct may be permissible or commonplace; political and economic instability; protectionist economic policies; changes in tariffs and taxes; difficulties in staffing and managing international operations; changes in data privacy regulations; longer accounts receivable payment cycles; and the burdens of complying with a wide variety of foreign laws and regulations. Effective patent, copyright, trademark and trade secret protection may not be available in every foreign country in which the Company sells its products and services. The Company's business, financial position, results of operations and cash flows could be materially, adversely affected by any of these risks.



**Sales Forecasts.** The Company makes many operational and strategic decisions based upon short- and long-term sales forecasts. The Company's sales personnel continually monitor the status of all proposals, including the estimated closing date and the value of the sale, in order to forecast quarterly sales. These forecasts are subject to significant estimation and are impacted by many external factors, including global economic conditions and the performance of the Company's customers. A variation in actual sales activity from that forecasted could cause the Company to plan or budget incorrectly and, therefore, could adversely affect the Company's business, financial position, results of operations and cash flows. The Company's management team forecasts macroeconomic trends and developments, and integrates them through long-range planning into budgets, research and development strategies and a wide variety of general management duties. Global economic conditions, and the effect those conditions and other disruptions in global markets have on the Company's customers, may have a significant impact on the accuracy of the Company's sales forecasts. These conditions may increase the likelihood or the magnitude of variations between actual sales activity and the Company's sales forecasts and, as a result, the Company's performance may be hindered because of a failure to properly match corporate strategy with economic conditions. This, in turn, may adversely affect the Company's business, financial position, results of operations and cash flows.

**Stock Market and Stock Price Volatility.** Market prices for securities of software companies have generally been volatile. In particular, the market price of the Company's common stock has been, and may continue to be, subject to significant fluctuations as a result of factors affecting the Company, the software industry or the securities markets in general. Such factors include, but are not limited to, declines in trading price that may be triggered by the Company's failure to meet the expectations of securities analysts and investors. Moreover, the trading price could be subject to additional fluctuations in response to quarter-to-quarter variations in the Company's operating results, material announcements made by the Company or its competitors, conditions in the financial markets or the software industry generally, or other events and factors, many of which are beyond the Company's control.

**Rapidly Changing Technology; New Products; Risk of Product Errors.** The Company operates in an industry generally characterized by rapidly changing technology and frequent new product introductions, which can render existing products obsolete or unmarketable. A major factor in the Company's future success will be its ability to anticipate technological changes and to develop and introduce, in a timely manner, enhancements to its existing products, products acquired in acquisitions and new products to meet those changes. If the Company is unable to introduce new products and to respond quickly to industry changes, its business, financial position, results of operations and cash flows could be materially, adversely affected.

The introduction and marketing of new or enhanced products require the Company to manage the transition from existing products in order to minimize disruption in customer purchasing patterns. There can be no assurance that the Company will be successful in developing and marketing, on a timely basis, new products or product enhancements, that the new products will adequately address the changing needs of the marketplace or that the Company will successfully manage the transition from existing products. Software products as complex as those offered by the Company may contain undetected errors when first introduced, or as new versions are released, and the likelihood of errors is increased as a result of the Company's commitment to the frequency of its product releases. There can be no assurance that errors will not be found in any new or enhanced products after the commencement of commercial shipments. Certain products require a higher level of sales and support expertise. Failure of the Company's sales channel, particularly the indirect channel, to obtain this expertise and to sell the new product offerings effectively could have an adverse impact on the Company's sales in future periods. Any of these problems may result in the loss of or delay in customer acceptance, diversion of development resources, damage to the Company's reputation, or increased service and warranty costs, any of which could have a material adverse effect on the Company's business, financial position, results of operations and cash flows.

**Product Quality.** The Company has separate quality systems and registrations under the ISO 9001:2008 standard, in addition to other governmental and industrial regulations. The Company's continued compliance with quality standards and favorable outcomes in periodic examinations is important to retain current customers and vital to procure new sales. If the Company was determined not to be compliant with various regulatory or ISO 9001/9000 standards, its certificates of registration could be suspended, requiring remedial action and a time-consuming re-registration process. Product quality issues or failures could result in the Company's reputation becoming diminished, resulting in a material adverse impact on revenue, operating margins, net income, financial position and cash flows.

**Competition.** The Company continues to experience competition across all markets for its products and services. Some of the Company's current and possible future competitors have greater financial, technical, marketing and other resources than the Company, and some have well-established relationships with current and potential customers of the Company. The Company's current and possible future competitors also include firms that have competed or may in the future elect to compete by means of open source licensing. Parties among the Company's current or future strategic alliances may diminish or sever technical, software development and marketing relationships with the Company for competitive purposes. These competitive pressures may result in decreased sales volumes, price reductions and/or increased operating costs, and could result in lower revenues, margins and net income.

**Changes in the Company's Pricing Models.** The intense competition the Company faces in the sales of its products and services, and general economic and business conditions, can put pressure on the Company to adjust its prices. If the Company's competitors offer deep discounts on certain products or services, or develop products that the marketplace considers more valuable, the Company may need to lower prices or offer discounts or other favorable terms in order to compete successfully. Any such changes may reduce operating margins and could adversely affect operating results. The Company's maintenance products, which include software license updates and product support fees, are generally priced as a percentage of its new software license fees. The Company's competitors may offer lower percentage pricing on product updates and support that could put pressure on the Company to further discount its new license or product support prices.

Any broad-based change to the Company's prices and pricing policies could cause new software license and service revenues to decline or be delayed as its sales force implements and its customers adjust to the new pricing policies. Some of the Company's competitors may bundle software products for promotional purposes or as a long-term pricing strategy or provide guarantees of prices, product implementations or wider geographical license usage provisions. These practices could, over time, significantly constrain the prices that the Company can charge for certain products. If the Company does not adapt its pricing models to reflect changes in customer use of its products or changes in customer demand, the Company's new software license revenues could decrease. Additionally, increased distribution of applications through application service providers, including software-as-a-service providers, may reduce the average price for the Company's products or adversely affect other sales of the Company's products, reducing new software license revenues unless the Company can offset price reductions with volume increases. The increase in open source software distribution may also cause the Company to adjust its pricing models.

**Dependence on Senior Management and Key Technical Personnel.** The Company's success depends upon the continued services of the Company's senior executives, key technical employees and other employees. Each of the Company's executive officers, key technical personnel and other employees could terminate his or her relationship with the Company at any time. The loss of any of the Company's senior executives might significantly delay or prevent the achievement of the Company's business objectives and could materially harm the Company's business and customer relationships.

In addition, because of the highly technical nature of the Company's products, the Company must attract and retain highly skilled engineering and development personnel, many of whom are recruited from outside of the United States. The market for this talent is highly competitive. The Company is limited in its ability to recruit internationally by restrictive domestic immigration laws. If the immigration laws become stricter or if the Company has less success in recruiting and retaining key personnel, the Company's business, reputation and operating results could be materially and adversely affected.

**Dependence on Proprietary Technology.** The Company's success is highly dependent upon its proprietary technology. The Company generally relies on contracts and the laws of copyrights, patents, trademarks and trade secrets to protect its technology. The Company maintains a trade secrets program, enters into confidentiality agreements with its employees and channel partners, and limits access to and distribution of its software, documentation and other proprietary information. There can be no assurance that the steps taken by the Company to protect its proprietary technology will be adequate to prevent misappropriation of its technology by third parties, or that third parties will not be able to develop similar technology independently. Costly and time-consuming litigation could be necessary to enforce and determine the scope of trade secret rights and related confidentiality and nondisclosure provisions. Although the Company is not aware that any of its technology infringes upon the rights of third parties, there can be no assurance that other parties will not assert technology infringement claims against the Company or that, if asserted, such claims will not prevail.

**Risks Associated with Security of the Company's Products, Source Code and IT Systems.** The Company makes significant efforts to maintain and improve the security and integrity of its products, source code, computer systems and data. Despite significant efforts to create security barriers to such programs, it is virtually impossible for the Company to entirely mitigate this risk. There appears to be an increasing number of computer "hackers" developing and deploying a variety of destructive software programs (such as viruses, worms and the like) that could attack the Company's products and computer systems. As a result, the Company may incur costs to increase personnel and technology to prevent such attacks. Because the techniques used to obtain unauthorized access to networks or to sabotage systems change frequently and generally are not recognized until launched against a target, the Company may be unable to anticipate these techniques or to implement adequate preventative measures. Like all software products, the Company's software is vulnerable to such attacks. The impact of such an attack could disrupt the proper functioning of the Company's software products, cause errors in the output of its customers' work, allow unauthorized access to sensitive, proprietary or confidential information of the Company or its customers and result in other destructive outcomes. If this were to occur, the Company's reputation may suffer, customers may stop buying products, the Company could face lawsuits and potential liability, and the Company's financial performance could be negatively impacted.

There is also a danger of industrial espionage, cyber-attacks, misuse, theft of information or assets (including source code), or damage to assets by people who have gained unauthorized access to the Company's facilities, systems or information. This includes phishing, which has become a very prevalent technique. Such cybersecurity breaches, misuse or other disruptions could lead to the disclosure of portions of the Company's product source code or other confidential information, improper usage and distribution of the Company's products without compensation, illegal usage of the Company's products which could jeopardize the security of information stored in and transmitted through its computer systems, and theft, manipulation and destruction of private and proprietary data, resulting in defective products and production downtimes. Although the Company actively employs measures to combat unlicensed copying, access and use of software and intellectual property through a variety of techniques, preventing unauthorized use or infringement of the Company's rights is inherently difficult. These events could adversely affect the Company's financial results or could result in significant claims for damages against it. Participating in lawsuits to protect against any such unauthorized access to, usage of or disclosure of any of the Company's products or any portion of the Company's product source code, or in prosecutions in connection with any such cybersecurity breach, could be costly and time-consuming, and may divert management's attention and adversely affect the market's perception of the Company and its products.

Policing the unauthorized distribution and use of the Company's products is difficult, and software piracy (including online piracy) is a persistent problem. The proliferation of technology designed to circumvent typical software protection measures used in the Company's products, and the possibility of methods that circumvent the techniques it employs in its products, may lead to an expansion in piracy or misuse of its products and intellectual property. As a result, and despite the Company's efforts to prevent such activities and to prosecute instances of such activities, the Company may nonetheless lose significant revenue due to illegal use of its software, and management's attention may be diverted to address specific instances of piracy or misuse, or to address piracy and misuse in general.

A number of the Company's core processes, such as software development, sales and marketing, customer service and financial transactions, rely on its IT infrastructure and applications. The Company also relies upon third-party products, which are exposed to various security vulnerabilities. Malicious software, sabotage and other cybersecurity breaches of the types discussed above could cause an outage of the Company's infrastructure, which could lead to a substantial denial of service and ultimately to production downtime, recovery costs and customer claims. This could have a significant negative impact on the Company's business, financial position, profit and cash flows.

The Company has implemented a number of measures designed to ensure the security of its information, IT resources and other assets. Nonetheless, unauthorized users could gain access to its systems through cyber-attacks and steal, use without authorization, and sabotage the Company's intellectual property and confidential data. Any breach of its IT security, misuse or theft could lead to loss of production, recovery costs or litigation brought by employees, customers or business partners, which could have a significant negative impact on the Company's business, financial position, profit, cash flows and reputation.

**Implementation of IT Systems.** The Company is currently implementing a new Customer Relationship Management (CRM) system. While this system is anticipated to simplify the sales and order processing efforts and to enhance customer service, there is a risk that the project will not achieve the anticipated benefits or that the benefits will not be achieved as quickly as anticipated. There is also a risk that the Company will have to write off previously capitalized expenditures if the project is not successful or if implementation decisions regarding the project are modified. The project implementation timeline and scope may change and become longer and broader as new facets of the design and implementation efforts are undertaken. This may take the attention of key operational management away from other aspects of the business, including the integration of acquisitions, and also result in increased consulting and software costs. These factors may have a significant negative impact on the Company's business, financial position, profit, cash flows and reputation.

**Dependence on Channel Partners.** The Company continues to distribute a meaningful portion of its products through its global network of independent, regional channel partners. The channel partners sell the Company's software products to new and existing customers, expand installations within the existing customer base, offer consulting services and provide the first line of technical support. Consequently, in certain geographies, the Company is highly dependent upon the efforts of the channel partners. Difficulties in ongoing relationships with channel partners, such as failure to meet performance criteria or to promote the Company's products as aggressively as the Company expects, and differences in the handling of customer relationships, could adversely affect the Company's performance. Additionally, the loss of any major channel partner for any reason, including a channel partner's decision to sell competing products rather than the Company's products, could have a material adverse effect on the Company. Moreover, the Company's future success will depend substantially on the ability and willingness of its channel partners to continue to dedicate the resources necessary to promote the Company's portfolio of products and to support a larger installed base of the Company's products. If the channel partners are unable or unwilling to do so, the Company may be unable to sustain revenue growth.

The Company has been increasing its number of channel partners, particularly in international locations. The business relationships with these channel partners are recently established and could result in additional compliance burdens for the Company. These partners also have a less-established payment history with the Company and revenue from these partners could come with a higher rate of bad debt expense.

During times of significant fluctuations in world currencies, certain channel partners may have solvency issues to the extent that effective hedge strategies are not employed or there is not sufficient working capital. In particular, if the U.S. Dollar strengthens relative to other currencies, certain channel partners who pay the Company in U.S. Dollars may have trouble paying the Company on time or may have trouble distributing the Company's products due to the impact of the currency exchange fluctuation on such channel partner's cash flows. This may impact the Company's ability to distribute its products into certain regions and markets, and may have an adverse effect on the Company's results of operations and cash flows.

***Reliance on Perpetual Licenses.*** Although the Company has historically maintained stable recurring revenue from the sale of software lease licenses and software maintenance subscriptions, it also has relied on sales of perpetual licenses that involve the payment of a single, up-front fee. Historically, these licenses have been more typical in the computer software industry and remain as the preferred licensing approach in certain markets. While revenue generated from software lease licenses and software maintenance subscriptions currently represents a portion of the Company's revenue, to the extent that perpetual license revenue continues to represent a significant percentage of total revenue, the Company's revenue in any period will depend significantly on sales completed during that period. If customer purchasing patterns shift toward a stronger preference for lease licenses and fewer perpetual licenses, as the Company has recently experienced, there could be a short-term, adverse impact on the Company's revenue and profitability.

***Renewal Rates for Annual Lease and Maintenance Contracts.*** A substantial portion of the Company's license and maintenance revenue is derived from annual lease and maintenance contracts. These contracts are generally renewed on an annual basis and typically have a high rate of customer renewal. In addition to the recurring revenue base associated with these contracts, a majority of customers purchasing new perpetual licenses also purchase related annual maintenance contracts. If the rate of renewal for these contracts is adversely affected by economic or other factors, the Company's license and maintenance growth will be adversely affected over the term that the revenue for those contracts would have otherwise been recognized. As a result, the Company's business, financial position, results of operations and cash flows may also be adversely impacted during those periods.

***Risks Associated with Acquisitions.*** Historically, the Company has consummated acquisitions in order to support the Company's long-term strategic direction, accelerate innovation, provide increased capabilities to existing products, supply new products and services, expand its customer base and enhance its distribution channels. The Company has completed a number of acquisitions in recent years and expects to make additional acquisitions in the future, but may not be able to identify suitable acquisition candidates or, if suitable candidates are identified, the Company may not be able to complete the business combination on commercially acceptable terms. The process of exploring and pursuing acquisition opportunities may result in devotion of significant management and financial resources.

Even if the Company is able to consummate acquisitions that it believes will be successful, such transactions present many risks including, among others, difficulty in integrating the management teams, strategies, cultures and operations of the companies; failing to achieve anticipated synergies and revenue increases; difficulty incorporating and integrating the acquired technologies or products with the Company's existing product lines; difficulty in coordinating, establishing or expanding sales, distribution and marketing functions, as necessary; difficulty in training the global sales team to sell the acquired products; failure to develop new products and services that utilize the technologies and resources of the companies; disruption of the Company's ongoing business and diversion of management's attention to transition or integration issues; unanticipated and unknown liabilities; the loss of key employees, customers, partners and channel partners of the Company or of the acquired company, resulting in the loss of key information, expertise or know-how, and unanticipated additional recruitment and training costs; infringement of intellectual property rights; and difficulties implementing and maintaining sufficient controls, policies and procedures over the systems, products and processes of the acquired company. If the Company does not achieve the anticipated benefits of its acquisitions as rapidly or to the extent anticipated by the Company's management and financial or industry analysts, there could be a material adverse effect on the Company's stock price, business, financial position, results of operations and cash flows.

In addition, for companies acquired, limited experience will exist for several quarters following the acquisition relating to how the acquired company's sales pipelines will convert into sales or revenues, and the conversion rate post-acquisition may be quite different than the historical conversion rate. Because a substantial portion of the Company's sales are completed in the latter part of a quarter, and its cost structure is largely fixed in the short-term, revenue shortfalls may have a negative impact on the Company's profitability. A delay in a small number of large, new software license transactions could cause the Company's quarterly software license revenues to fall significantly short of its predictions.

The Company may periodically be involved in business combinations with enterprises that are developmental in nature. While these entities have leading-edge technology, they may not have developed direct or indirect distribution channels and may not have software revenues which cover the ongoing expenses. Therefore, the Company may have a decrease in operating margin and profitability while these types of acquisitions are integrated and the distribution channel incorporates the new product offerings.

***Disruption of Operations or Infrastructure Failures.*** A significant portion of the Company's software development personnel, source code and computer equipment is located at operating facilities in the United States, Canada, India, Japan and throughout Europe. The occurrence of a natural disaster or other unforeseen catastrophe at any of these facilities could cause interruptions in the Company's operations, services and product development activities. Additionally, if the Company experiences problems that impair its business infrastructure, such as a computer virus, telephone system failure or an intentional disruption of its information technology systems by a third party, these interruptions could have a material adverse effect on the Company's business, financial position, results of operations, cash flows and the ability to meet financial reporting deadlines. Further, because the Company's sales are not generally linear during any quarterly period, the potential adverse effects resulting from any of the events described above or any other disruption of the Company's business could be accentuated if it occurs close to the end of a fiscal quarter.

***Risks Associated with Significant Sales to Existing Customers.*** A significant portion of the Company's sales includes follow-on sales to existing customers that invest in the Company's broad suite of engineering simulation software and services. If a significant number of current customers were to become dissatisfied with the Company's products and services, or choose to license or utilize competitive offerings, the Company's follow-on sales, and recurring lease and maintenance revenues, could be materially, adversely impacted, resulting in reduced revenue, operating margins, net income and cash flows.

***Industry Consolidation.*** Consolidation in industries that utilize the Company's software may result in combined workforces where economies of scale and synergies are achieved, and fewer ANSYS software licenses are required. Consolidation may also result in the newly combined/surviving entity wanting the most favorable pricing from the former contracts and expecting larger volume discounts on future purchases. If a customer is acquired by an entity that does not utilize ANSYS in favor of a competing product, the Company may not have future orders from the enterprise. Further, consolidation of the Company's competitors may result in synergies that allow those competitors to benefit from broader sales channels and increased access to capital. Any of these impacts could adversely affect the Company's business, financial position, results of operations and cash flows.

***Periodic Reorganization of Sales Force.*** The Company relies heavily on its direct sales force. From time to time, the Company reorganizes and makes adjustments to its sales leadership and/or its sales force in response to such factors as management changes, performance issues, market opportunities and other considerations. These changes may result in a temporary lack of sales production and may adversely impact revenue in future quarters. There can be no assurance that the Company will not restructure its sales force in future periods or that the transition issues associated with such a restructuring will not occur.

***Regulatory Compliance.*** Like all other public companies, the Company is subject to the rules and regulations of the SEC, including those that require the Company to report on and receive an attestation from its independent registered public accounting firm regarding the Company's internal control over financial reporting. Compliance with these requirements causes the Company to incur additional expenses and causes management to divert time from the day-to-day operations of the Company. While the Company anticipates being able to fully comply with these requirements, if it is not able to comply with the reporting or attestation requirements relating to internal control over financial reporting, the Company may be subject to sanctions by the SEC or NASDAQ. Such sanctions could divert the attention of the Company's management from implementing its business plan and could have an adverse effect on the Company's business and results of operations.

As the Company's stock is listed on the NASDAQ Global Select Market, the Company is subject to the ongoing financial and corporate governance requirements of NASDAQ. While the Company anticipates being able to fully comply with these requirements, if it is not able to comply, the Company's name may be published on NASDAQ's daily Non-Compliant Companies list until NASDAQ determines that it has regained compliance or the Company no longer trades on NASDAQ. If the Company was unable to return to compliance with the governance requirements of NASDAQ, the Company may be delisted from the NASDAQ Global Select Market, which could have an adverse effect on the market value of the Company's equity securities and the ability to raise additional capital.

***Governmental Revenue Sources.*** The Company's sales to the United States government must comply with Federal Acquisition Regulations. Failure to comply with these regulations could result in penalties being assessed against the Company or an order preventing the Company from making future sales to the United States government. Further, the Company's international activities must comply with the export control laws of the United States and other countries, the Foreign Corrupt Practices Act, the United Kingdom Bribery Act of 2010 and a variety of other laws and regulations of the United States and other countries in

which the Company operates. Failure to comply with any of these laws and regulations could adversely affect the Company's business, financial position, results of operations and cash flows.

In certain circumstances, the United States government, state and local governments and their respective agencies, and certain foreign governments may have the right to terminate contractual arrangements at any time, without cause. The United States, European Union and certain other government contracts, as well as the Company's state and local level contracts, are subject to the approval of appropriations or funding authorizations. Certain of these contracts permit the imposition of various civil and criminal penalties and administrative sanctions, including, but not limited to, termination of contracts, refund of a portion of fees received, forfeiture of profits, suspension of payments, fines and suspensions or debarment from future government business, any of which could have an adverse effect on the Company's results of operations and cash flows.

**Contingencies.** The Company is subject to various investigations, claims and legal proceedings that arise in the ordinary course of business, including commercial disputes, labor and employment matters, tax audits, alleged infringement of intellectual property rights and other matters. Each of these matters is subject to various uncertainties, and it is possible that an unfavorable resolution of one or more of these matters could materially affect the Company's results of operations, cash flows and financial position.

**Income Tax Estimates.** The Company makes significant estimates in determining its worldwide income tax provision. These estimates involve complex tax regulations in a number of jurisdictions across the Company's global operations and are subject to many transactions and calculations in which the ultimate tax outcome is uncertain. The final outcome of tax matters could be different than the estimates reflected in the historical income tax provision and related accruals. Such differences could have a material impact on income tax expense and net income in the periods in which such determinations are made.

The amount of income tax paid by the Company is subject to ongoing audits by federal, state and foreign tax authorities. These audits can result in additional assessments, including interest and penalties. The Company's estimate for liabilities associated with uncertain tax positions is highly judgmental and actual future outcomes may result in favorable or unfavorable adjustments to the Company's estimated tax liabilities, including estimates for uncertain tax positions, in the period the assessments are made or resolved, audits are closed or when statutes of limitation on potential assessments expire. As a result, the Company's effective tax rate may fluctuate significantly on a quarterly or annual basis.

The Company allocates a portion of its purchase price to goodwill and intangible assets. Impairment charges associated with goodwill are generally not tax-deductible and will result in an increased effective income tax rate in the period the impairment is recorded. The Company has recorded significant deferred tax liabilities related to acquired intangible assets that are not deductible for tax purposes. These deferred tax liabilities are based on future statutory tax rates in the locations in which the intangible assets are recorded. Any future changes in statutory tax rates would be recorded as an adjustment to the deferred tax liabilities in the period the change is announced, and could have a material impact on the Company's effective tax rate during that period.

**Changes in Tax Law.** The Company's operations are subject to income and transaction taxes in the United States and in multiple foreign jurisdictions. A change in the tax law in the jurisdictions in which the Company does business, including an increase in tax rates, an adverse change in the treatment of an item of income or expense, or a decrease in tax rates in a jurisdiction in which the Company has significant deferred tax assets, could result in a material increase in tax expense. Currently, a substantial portion of the Company's revenue is generated from customers located outside the United States, and a substantial portion of assets are located outside the United States. Changes in existing taxation rules or practices, new taxation rules, or varying interpretations of current taxation practices could have a material adverse effect on the Company's results of operations or the manner in which the Company conducts its business.

The U.S. government's enactment of comprehensive tax legislation, commonly referred to as the Tax Cuts and Jobs Act, could cause management to divert time from the day-to-day operations of the Company, which could impact the Company's business. If the Company is unable to successfully transition its business systems, processes and internal controls, it could impact the ability to meet financial reporting deadlines.

The Company has significant operations in India. There have been court rulings concerning certain Indian tax laws that have been inconsistent with tax positions taken by the Company and inconsistent with the advice provided to the Company by its tax advisors.

An Indian subsidiary of the Company has several service tax audits pending that have resulted in formal inquiries being received on transactions through mid-2012. The Company could incur tax charges and related liabilities of approximately \$7.5 million. The service tax issues raised in the Company's notices and inquiries are very similar to the case, M/s Microsoft Corporation (I) (P) Ltd. Vs Commissioner of Service Tax, New Delhi, wherein the Delhi Customs, Excise and Service Tax Appellate Tribunal (CESTAT) has passed a favorable ruling to Microsoft. The Company can provide no assurances on whether the Microsoft case's favorable ruling will be challenged in higher courts or on the impact that the present Microsoft case's decision will have on the Company's cases. The Company is uncertain as to when these service tax matters will be concluded.

Other court cases are pending in India that could have a material impact on the Company's financial position, results of operations and cash flows if the ultimate outcome of those cases is similarly inconsistent with tax positions taken by the Company.

A French subsidiary of the Company previously received notice that the French taxing authority rejected the Company's 2012 research and development credit. The Company contested the decision and received a favorable outcome during the first half of 2017. There are currently no challenges to other years' research and development credits for this subsidiary; however, other years are subject to future review and audit.

***Changes in Existing Financial Accounting Standards.*** Changes in existing accounting rules or practices, new accounting pronouncements, or varying interpretations of current accounting pronouncements could have a significant adverse effect on the Company's results of operations or the manner in which the Company conducts its business.

In addition, the Company could incur significant costs for changes to its business systems, processes and internal controls as a result of the transition. These costs could have a significant adverse impact on the Company's results of operations and cash flows. The transition could also cause management to divert time from the day-to-day operations of the Company, which could impact the Company's business. If the Company is unable to successfully transition its business systems, processes and internal controls before the guidance effective date, it could impact the ability to meet financial reporting deadlines. For further information on the impact of recently issued accounting guidance on the Company, see Note 2 to the consolidated financial statements included in Part IV, Item 15 of this Annual Report on Form 10-K.

## **ITEM 1B. UNRESOLVED STAFF COMMENTS**

The Company has received no written comments regarding our periodic or current reports from the staff of the SEC that were issued 180 days or more preceding the end of our fiscal year 2017 and that remain unresolved.

## **ITEM 2. PROPERTIES**

The Company's executive offices and those related to certain domestic product development, marketing, production and administration are located in a LEED certified, 186,000 square foot office facility in Canonsburg, Pennsylvania. The lease for this facility was effective as of September 14, 2012 and expires on December 31, 2029.

The Company owns: a 70,000 square foot office facility in Lebanon, New Hampshire; a 62,000 square foot office building near its current Canonsburg headquarters; and a 59,000 square foot facility in Pune, India.

The Company and its subsidiaries also lease office space in various locations throughout the world. The Company owns substantially all equipment used in its facilities. Management believes that, in most geographic locations, its facilities allow for sufficient space to support present and future foreseeable needs, including such expansion and growth as the business may require. In other geographic locations, the Company expects that it will be required to expand capacity beyond that which it currently owns or leases.

The Company's properties and equipment are in good operating condition and are adequate for the Company's current needs. The Company does not anticipate difficulty in renewing existing leases as they expire or in finding alternative facilities.

**ITEM 3. LEGAL PROCEEDINGS**

The Company is subject to various investigations, claims and legal proceedings that arise in the ordinary course of business, including commercial disputes, labor and employment matters, tax audits, alleged infringement of intellectual property rights and other matters. In the opinion of the Company, the resolution of pending matters is not expected to have a material adverse effect on the Company's consolidated results of operations, cash flows or financial position. However, each of these matters is subject to various uncertainties and it is possible that an unfavorable resolution of one or more of these proceedings could materially affect the Company's results of operations, cash flows or financial position.

**ITEM 4. MINE SAFETY DISCLOSURES**

Not applicable.



## PART II

### ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

The Company's common stock trades on the NASDAQ Global Select Market tier of the NASDAQ Stock Market under the symbol: "ANSS". The following table sets forth the low and high sale prices of the Company's common stock in each of the Company's last eight fiscal quarters:

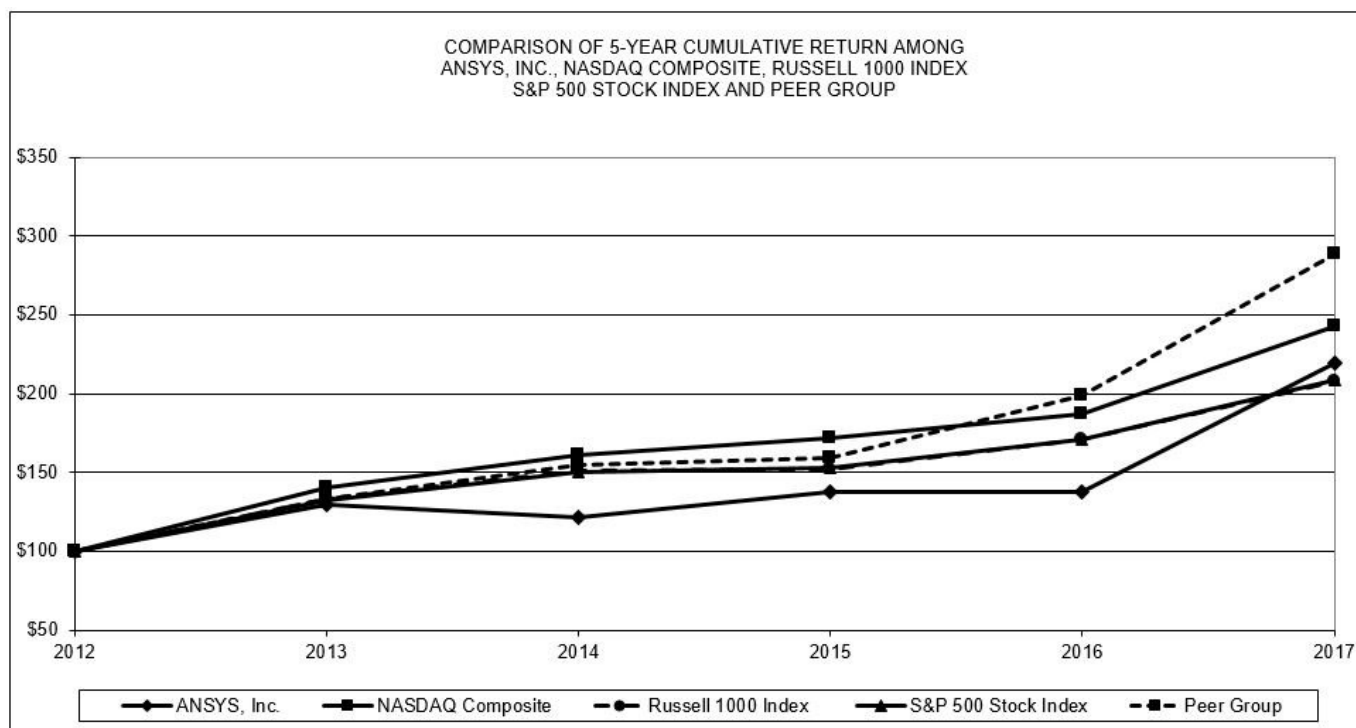
	Fiscal Quarter Ended 2017		Fiscal Quarter Ended 2016	
	Low Sale Price	High Sale Price	Low Sale Price	High Sale Price
December 31	\$ 123.16	\$ 155.14	\$ 82.28	\$ 96.21
September 30	\$ 119.20	\$ 132.74	\$ 88.30	\$ 98.99
June 30	\$ 104.65	\$ 129.85	\$ 81.41	\$ 92.48
March 31	\$ 91.89	\$ 108.92	\$ 80.51	\$ 91.62

On February 19, 2018, there were 139 stockholders of record. On December 5, 2017, there were 78,301 beneficial holders of the Company's common stock.

The Company has not paid cash dividends on its common stock as it has retained earnings primarily for acquisitions, for future business opportunities and to repurchase stock when authorized by the Board of Directors and when such repurchase meets the Company's objectives. The Company reviews its policy with respect to the payment of dividends from time to time; however, there can be no assurance that any dividends will be paid in the future.

## Performance Graph

Set forth below is a line graph comparing the yearly percentage change in the cumulative total stockholder return on the Company's common stock, based on the market price of the Company's common stock, with the total return of companies included within the NASDAQ Composite Stock Market Index, the Russell 1000 Index, the S&P 500 Stock Index and an industry peer group of four companies (Autodesk, Inc., PTC Inc., Cadence Design Systems, Inc. and Synopsys, Inc.) selected by the Company pursuant to Item 201(e) of Regulation S-K, for the period commencing December 31, 2012 and ending December 31, 2017. Due to the fact that the Company is now included in the S&P 500 Stock Index, the SEC's rules require the use of that index for the required five-year graph. The calculation of total cumulative returns assumes a \$100 investment in the Company's common stock, the NASDAQ Composite Stock Market Index, the Russell 1000 Index, the S&P 500 Stock Index and the peer group on December 31, 2012, and the reinvestment of all dividends, and accounts for all stock splits. The historical information set forth below is not necessarily indicative of future performance.



ASSUMES \$100 INVESTED ON DECEMBER 31, 2012

ASSUMES DIVIDENDS REINVESTED

FIVE FISCAL YEARS ENDING DECEMBER 31, 2017

	As of December 31,					
	2012	2013	2014	2015	2016	2017
<b>ANSYS, Inc.</b>	\$ 100	\$ 129	\$ 122	\$ 137	\$ 137	\$ 219
<b>NASDAQ Composite</b>	\$ 100	\$ 140	\$ 161	\$ 172	\$ 187	\$ 243
<b>Russell 1000 Index</b>	\$ 100	\$ 133	\$ 151	\$ 152	\$ 170	\$ 207
<b>S&amp;P 500 Stock Index</b>	\$ 100	\$ 132	\$ 151	\$ 153	\$ 171	\$ 208
<b>Peer Group</b>	\$ 100	\$ 133	\$ 155	\$ 159	\$ 198	\$ 289

## Equity Compensation Plan Information as of December 31, 2017

Plan Category	(a)	(b)	(c)
	Number of Securities to be Issued Upon Exercise of Outstanding Options, Warrants and Rights	Weighted Average Exercise Price of Outstanding Options, Warrants and Rights	Number of Securities Remaining Available for Future Issuance Under Equity Compensation Plans (excluding securities reflected in column (a))
Equity Compensation Plans Approved by Security Holders			
1996 Stock Option and Grant Plan	2,001,106	\$ 61.72	7,799,333 <sup>(3)</sup>
Ansoft Corporation 2006 Stock Incentive Plan	101,309	\$ 35.86	—
Apache Design Solutions, Inc. 2001 Stock/Option Issuance Plan	56,919	\$ 18.78	—
SpaceClaim Corporation 2005 Stock Incentive Plan	5,411	\$ 23.86	—
Gear Design Solutions, Inc. Stock Incentive Plan	5,415	\$ 12.26	—
1996 Employee Stock Purchase Plan	(1)	(2)	291,495
Equity Compensation Plans Not Approved by Security Holders			
None			
Total	2,170,160		8,090,828

- (1) The number of shares issuable with respect to the current offering period is not determinable until the end of the period.
- (2) The per share purchase price of shares issuable with respect to the current offering period is not determinable until the end of the period.
- (3) The number of securities remaining available for future issuance assumes maximum attainment for awards with a performance condition or a market condition.

### Unregistered Sale of Equity Securities and Use of Proceeds

None.

### Issuer Purchases of Equity Securities

Period	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Maximum Number of Shares that May Yet Be Purchased Under Plans or Programs <sup>(1)</sup>
October 1 - October 31, 2017	—	\$ —	—	3,500,000
November 1 - November 30, 2017	655,740	\$ 150.80	655,740	2,844,260
December 1 - December 31, 2017	94,260	\$ 147.12	94,260	2,750,000
Total	<u>750,000</u>	\$ 150.33	<u>750,000</u>	2,750,000

<sup>(1)</sup> The Company initially announced its stock repurchase program in February 2000, and subsequently announced various amendments to the program. The most recent amendment to the program, authorizing the repurchase of up to 5,000,000 shares, was approved by the Company's Board of Directors in February 2018. There is no expiration date to this amendment.

## ITEM 6. SELECTED FINANCIAL DATA

The following table sets forth selected financial data as of and for the year ended December 31 for each of the last five years. This selected financial data should be read in conjunction with the consolidated financial statements and related notes included in Part IV, Item 15 of this Annual Report on Form 10-K.

<i>(in thousands, except per share data)</i>	Year Ended December 31,				
	2017	2016	2015	2014	2013
Total revenue	\$ 1,095,250	\$ 988,465	\$ 942,753	\$ 936,021	\$ 861,260
Operating income	390,728	376,242	353,679	347,450	321,863
Net income	259,251	265,636	252,521	254,690	245,327
Earnings per share – basic	\$ 3.05	\$ 3.05	\$ 2.82	\$ 2.77	\$ 2.65
Weighted average shares – basic	84,988	87,227	89,561	92,067	92,691
Earnings per share – diluted	\$ 2.98	\$ 2.99	\$ 2.76	\$ 2.70	\$ 2.58
Weighted average shares – diluted	86,854	88,969	91,502	94,194	95,139
Total assets	\$ 2,941,623	\$ 2,800,526	\$ 2,729,904	\$ 2,752,879	\$ 2,702,097
Working capital	661,713	630,301	592,280	617,240	601,183
Long-term liabilities	87,239	53,021	51,331	70,303	125,469
Stockholders' equity	2,245,831	2,208,405	2,194,427	2,217,501	2,136,246
Cash provided by operating activities	430,438	365,980	375,699	399,838	342,954

Cash provided by operating activities in the above table was retrospectively adjusted for the adoption of Accounting Standards Update No. 2016-09. For further information, see Note 2 to the consolidated financial statements included in Part IV, Item 15 of this Annual Report on Form 10-K.

In the table above, the comparability of information among the years presented is impacted by the Company's acquisitions. The operating results of the Company's acquisitions have been included in the results of operations since their respective acquisition dates. For further information, see the "Acquisitions" section of Management's Discussion and Analysis of Financial Condition and Results of Operations in Item 7 and Note 3 to the consolidated financial statements included in Part IV, Item 15 of this Annual Report on Form 10-K.

## ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

### Overview

The Company's GAAP results for the year ended December 31, 2017 reflect growth in revenue of 10.8% and operating income of 3.9% while diluted earnings per share was comparable to the year ended December 31, 2016. The Company experienced higher revenue in 2017 across all classes of revenue, including license revenue, maintenance and services. The Company also experienced increased operating expenses primarily due to increased personnel costs, costs associated with workforce realignment activities and higher stock-based compensation. The Company's effective tax rate increased significantly in 2017 as a result of charges associated with the enactment of the U.S. Tax Cuts and Jobs Act.

The Company's non-GAAP results for the year ended December 31, 2017 reflect growth in revenue of 11.1%, operating income of 9.7% and diluted earnings per share of 10.5% as compared to the year ended December 31, 2016. The non-GAAP results exclude the income statement effects of the acquisition accounting adjustment to deferred revenue, stock-based compensation, amortization of acquired intangible assets, restructuring charges, transaction costs related to business combinations and the impact of the Tax Cuts and Jobs Act. For further disclosure regarding non-GAAP results, see the section titled "Non-GAAP Results" immediately preceding the section titled "Liquidity and Capital Resources."

The Company incurred \$11.7 million in restructuring charges, or \$7.9 million net of tax, during the year ended December 31, 2017. The Company completed the workforce realignment activities associated with these charges. These charges are excluded from the Company's non-GAAP results.

The Company's comparative financial results were impacted by fluctuations in the U.S. Dollar during the year ended December 31, 2017 as compared to the year ended December 31, 2016. The impacts on the Company's revenue and operating income due to currency fluctuations are reflected in the table below.

The amounts in the table represent the difference between the actual 2017 results and the same results calculated at the 2016 exchange rates. Amounts below indicate a net favorable impact from currency fluctuations.

<i>(in thousands)</i>	Year Ended December 31, 2017	
	GAAP	Non-GAAP
Revenue	\$ 5,394	\$ 5,403
Operating income	\$ 3,501	\$ 3,560

In constant currency<sup>(1)</sup>, the Company's growth rates were as follows:

	Year Ended December 31, 2017	
	GAAP	Non-GAAP
Revenue	10.3%	10.5%
Operating income	2.9%	8.9%

<sup>(1)</sup> Constant currency amounts exclude the effect of foreign currency fluctuations on the reported results. To present this information, the results for 2017 for entities whose functional currency is a currency other than the U.S. Dollar were converted to U.S. Dollars at rates that were in effect for 2016, rather than the actual exchange rates in effect for 2017.

The Company's financial position includes \$881.8 million in cash and short-term investments, and working capital of \$661.7 million as of December 31, 2017.

During the year ended December 31, 2017, the Company repurchased 2.8 million shares for \$336.0 million at an average price of \$122.20 per share under the Company's stock repurchase program.

### Business

On August 29, 2016, the Board of Directors (the Board) of the Company appointed Dr. Ajei S. Gopal, a member of the Board, as President and Chief Operating Officer of the Company, effective as of such date. In addition, effective as of January 1, 2017, Dr. Gopal assumed the role of Chief Executive Officer of the Company and Mr. James E. Cashman III, who was the Chief Executive Officer of the Company as of December 31, 2016, became Chairman of the Board. In connection therewith, Ronald W. Hovsepian, the Chairman of the Board as of December 31, 2016, became the Board's Lead Independent Director.

ANSYS, a Delaware corporation formed in 1994, develops and globally markets engineering simulation software and services widely used by engineers, designers, researchers and students across a broad spectrum of industries and academia, including aerospace and defense, automotive, electronics, semiconductors, energy, materials and chemical processing, turbomachinery, consumer products, healthcare, and sports. Headquartered south of Pittsburgh, Pennsylvania, the Company and its subsidiaries employed approximately 2,900 people as of December 31, 2017. The Company focuses on the development of open and flexible solutions that enable users to analyze designs directly on the desktop, providing a common platform for fast, efficient and cost-conscious product development, from design concept to final-stage testing and validation. The Company distributes its ANSYS suite of simulation technologies through a global network of independent resellers and distributors (collectively, channel partners) and direct sales offices in strategic, global locations. It is the Company's intention to continue to maintain this hybrid sales and distribution model.

The Company licenses its technology to businesses, educational institutions and governmental agencies. Growth in the Company's revenue is affected by the strength of global economies, general business conditions, currency exchange rate fluctuations, customer budgetary constraints and the competitive position of the Company's products. Please see Item 1A. Risk Factors for a complete discussion of factors that might impact the Company's financial condition and operating results. The Company believes that the features, functionality and integrated multiphysics capabilities of its software products are as strong as they have ever been. However, the software business is generally characterized by long sales cycles. These long sales cycles increase the difficulty of predicting sales for any particular quarter. The Company makes many operational and strategic decisions based upon short- and long-term sales forecasts that are impacted not only by these long sales cycles, but also by current global economic conditions. As a result, the Company believes that its overall performance is best measured by fiscal year results rather than by quarterly results. Please see the sub-section entitled "Sales Forecasts" under Item 1A. Risk Factors for a complete discussion of the potential impact of the Company's sales forecasts on the Company's financial condition, cash flows and operating results.

The Company's management considers the competition and price pressure that it faces in the short- and long-term by focusing on expanding the breadth, depth, ease of use and quality of the technologies, features, functionality and integrated multiphysics capabilities of its software products as compared to its competitors; investing in research and development to develop new and innovative products and increase the capabilities of its existing products; supplying new products and services; focusing on customer needs, training, consulting and support; and enhancing its distribution channels. From time to time, the Company also considers acquisitions to supplement its global engineering talent, product offerings and distribution channels.

### Geographic Trends

The following table presents the Company's geographic constant currency revenue growth during the year ended December 31, 2017 as compared to the year ended December 31, 2016:

	<b>Year Ended December 31, 2017</b>
North America	<b>13.1%</b>
Europe	<b>7.5%</b>
Asia-Pacific	<b>9.4%</b>
Total	<b>10.3%</b>

In North America, the Company's performance was primarily driven by the aerospace and defense, electronics, semiconductors and automotive industries. The performance within aerospace and defense continued to be driven by major and strategic accounts, growing demand from the commercial space sector and increased U.S. defense spending. The electronics industry continued to benefit from the placement of software into a wide range of smart, connected products. The automotive manufacturers maintained their strong investments in developing advanced technologies for autonomous, electric and smart, connected vehicles. The renewable energy sector remained strong as energy companies continued their investment initiatives and commodity prices improved.

While revenue growth in Europe showed improvement, it continued to lag the other regions. Sales leadership in the region remained focused on building the sales pipeline and finalizing initiatives to update the Company's go-to-market strategy. Europe demonstrated similar trends as North America except that the commodity recovery has not been fully realized. Additionally, the indirect channel grew faster than the direct business, helping to bolster the overall growth rate in the region.

The results in Asia-Pacific were driven by the aerospace and defense, electronics, automotive and industrial equipment sectors. The region continued to benefit from investment in domestic development programs, particularly in China and India. The indirect channel performance was especially strong in this region and contributed to the growth rate even more significantly than in Europe.

The Company continues to focus on a number of sales improvement activities across the geographic regions, including sales hiring, pipeline building, productivity initiatives and customer engagement activities.

### **Note About Forward-Looking Statements**

The following discussion should be read in conjunction with the audited consolidated financial statements and notes thereto included elsewhere in this Annual Report on Form 10-K. The Company's discussion and analysis of its financial condition and results of operations are based upon the Company's consolidated financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States of America (GAAP). The preparation of these financial statements requires the Company to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses, and related disclosure of contingent assets and liabilities. On an ongoing basis, the Company evaluates its estimates, including those related to fair values of stock awards, bad debts, contract revenue, acquired deferred revenue, the valuation of goodwill and other intangible assets, deferred compensation, income taxes, uncertain tax positions, tax valuation reserves, useful lives for depreciation and amortization, and contingencies and litigation. The Company bases its estimates on historical experience, market experience, estimated future cash flows and various other assumptions that management believes are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates.

This Annual Report on Form 10-K contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934, including, but not limited to, the following statements, as well as statements that contain such words as "anticipates," "intends," "believes," "plans" and other similar expressions:

- The Company's intentions regarding its hybrid sales and distribution model.
- The Company's intentions related to investments in research and development, particularly as it relates to expanding the ease of use and capabilities of its broad portfolio of simulation software products.
- The Company's expectations regarding the accelerated development of new and innovative products to the marketplace while lowering design and engineering costs for customers as a result of the Company's acquisitions.
- The Company's statements regarding the impact of global economic conditions.
- The Company's expectations regarding the outcome of its service tax audit cases.
- The Company's belief that, in most geographical locations, its facilities allow for sufficient space to support present and future foreseeable needs, including such expansion and growth as the business may require.
- The Company's expectation that it can renew existing facility leases as they expire or find alternative facilities without difficulty, as needed.
- The Company's assessment of the ultimate liabilities arising from various investigations, claims and legal proceedings.
- The Company's statement regarding the strength of the features, functionality and integrated multiphysics capabilities of its software products.
- The Company's belief that its overall performance is best measured by fiscal-year results rather than by quarterly results.
- The Company's expectations regarding the adverse impact on license and maintenance revenue growth in the near term due to an increased customer preference for time-based licenses.
- The Company's estimates regarding the expected impact on reported revenue related to the acquisition accounting treatment of deferred revenue.
- The Company's expectation that it will continue to make targeted investments in its global sales and marketing organizations and its global business infrastructure to enhance and support its revenue-generating activities.
- The Company's intention to repatriate previously taxed earnings and to reinvest all other earnings of its non-U.S. subsidiaries.
- The Company's plans related to future capital spending.

- The sufficiency of existing cash and cash equivalent balances to meet future working capital and capital expenditure requirements.
- The Company's belief that the best uses of its excess cash are to invest in the business and repurchase stock in order to both offset dilution and return capital, in excess of its requirements, to stockholders with the goal of increasing stockholder value.
- The Company's intentions related to investments in complementary companies, products, services and technologies.
- The Company's expectation that changes in currency exchange rates will affect the Company's financial position, results of operations and cash flows.
- The Company's expectations regarding future claims related to indemnification obligations.
- The Company's estimates regarding total compensation expense associated with granted stock-based awards for future years.
- The Company's expectations regarding the impacts of new accounting guidance.
- The Company's expectations regarding the impacts of the Tax Cuts and Jobs Act.
- The Company's assessment of its ability to realize deferred tax assets.

Forward-looking statements should not be unduly relied upon because they involve known and unknown risks, uncertainties and other factors, some of which are beyond the Company's control. The Company's actual results could differ materially from those set forth in the forward-looking statements. Certain factors that might cause such a difference include risks and uncertainties detailed in Item 1A. Risk Factors.

#### **Acquisitions**

During the years ended December 31, 2017, 2016 and 2015 the Company completed various acquisitions to expand its customer base and accelerate the development of new and innovative products to the marketplace while lowering design and engineering costs for customers. The acquisitions were not individually significant. The combined purchase prices of the acquisitions purchased during the years ended December 31, 2017, 2016 and 2015 were approximately \$67.0 million, \$10.3 million and \$49.7 million, respectively.

For further information on the Company's business combinations, see Note 3 to the consolidated financial statements included in Part IV, Item 15 of this Annual Report on Form 10-K.



## Results of Operations

For purposes of the following discussion and analysis, the table below sets forth certain consolidated financial data for the years 2017, 2016 and 2015. The operating results of the Company's acquisitions have been included in the results of operations since their respective acquisition dates.

<i>(in thousands)</i>	Year Ended December 31,		
	2017	2016	2015
Revenue:			
Software licenses	\$ 624,964	\$ 568,174	\$ 555,105
Maintenance and service	470,286	420,291	387,648
Total revenue	<u>1,095,250</u>	<u>988,465</u>	<u>942,753</u>
Cost of sales:			
Software licenses	34,421	28,860	29,105
Amortization	36,794	38,092	38,755
Maintenance and service	78,949	79,908	79,386
Total cost of sales	<u>150,164</u>	<u>146,860</u>	<u>147,246</u>
Gross profit	<u>945,086</u>	<u>841,605</u>	<u>795,507</u>
Operating expenses:			
Selling, general and administrative	338,640	269,515	253,603
Research and development	202,746	183,093	168,831
Amortization	12,972	12,755	19,394
Total operating expenses	<u>554,358</u>	<u>465,363</u>	<u>441,828</u>
Operating income	<u>390,728</u>	<u>376,242</u>	<u>353,679</u>
Interest income	6,962	4,209	2,829
Other (expense) income, net	(1,996)	(136)	257
Income before income tax provision	<u>395,694</u>	<u>380,315</u>	<u>356,765</u>
Income tax provision	136,443	114,679	104,244
Net income	<u>\$ 259,251</u>	<u>\$ 265,636</u>	<u>\$ 252,521</u>

## Year Ended December 31, 2017 Compared to Year Ended December 31, 2016

### Revenue:

<i>(in thousands, except percentages)</i>	Year Ended December 31,		Change	
	2017	2016	Amount	%
<b>Revenue:</b>				
Lease licenses	\$ 376,886	\$ 340,331	\$ 36,555	10.7
Perpetual licenses	248,078	227,843	20,235	8.9
Software licenses	624,964	568,174	56,790	10.0
Maintenance	440,428	394,745	45,683	11.6
Service	29,858	25,546	4,312	16.9
Maintenance and service	470,286	420,291	49,995	11.9
Total revenue	\$ 1,095,250	\$ 988,465	\$ 106,785	10.8

The Company's revenue increased 10.8% (10.3% in constant currency) during the year ended December 31, 2017 as compared to the year ended December 31, 2016. The growth rate was favorably impacted by the Company's continued investment in its global sales, support and marketing organizations. Lease license revenue increased 10.7% as compared to the prior year. Perpetual license revenue, which is derived primarily from new sales, increased 8.9% as compared to the prior year. Annual maintenance contracts that were sold with new perpetual licenses, along with maintenance contracts sold with new perpetual licenses in previous years, contributed to maintenance revenue growth of 11.6%. Service revenue, primarily composed of consulting projects, increased 16.9%.

With respect to revenue, on average for the year ended December 31, 2017, the U.S. Dollar was 1.0% weaker, when measured against the Company's primary foreign currencies, than for the year ended December 31, 2016. The table below presents the impacts of currency fluctuations on revenue for the year ended December 31, 2017. Amounts in brackets indicate a net adverse impact from currency fluctuations.

<i>(in thousands)</i>	Year Ended December 31, 2017
Euro	\$ 6,634
South Korean Won	1,439
Taiwan Dollar	886
Indian Rupee	838
Japanese Yen	(3,416)
British Pound	(1,316)
Other	329
Total	<u>\$ 5,394</u>

The weaker U.S. Dollar also resulted in increased operating income of \$3.5 million for the year ended December 31, 2017 as compared to the year ended December 31, 2016.

A substantial portion of the Company's license and maintenance revenue is derived from annual lease and maintenance contracts. These contracts are generally renewed on an annual basis and typically have a high rate of customer renewal. In addition to the recurring revenue base associated with these contracts, a majority of customers purchasing new perpetual licenses also purchase related annual maintenance contracts. As a result of the significant recurring revenue base, the Company's license and maintenance revenue growth rate in any period does not necessarily correlate to the growth rate of new license and maintenance contracts sold during that period. To the extent the rate of customer renewal for lease and maintenance contracts is high, incremental lease contracts, and maintenance contracts sold with new perpetual licenses, will result in license and maintenance revenue growth in constant currency. Conversely, if the rate of renewal for these contracts is adversely affected by economic or other factors, the Company's license and maintenance growth will be adversely affected over the term that the revenue for those contracts would have otherwise been recognized.

The Company is starting to experience an increased interest by some of its larger customers in enterprise agreements that often include longer-term, time-based licenses involving a larger number of the Company's software products. While these arrangements typically involve a higher overall transaction price, the revenue from these contracts has been typically deferred

under ASC 605 and recognized over the period of the contract, resulting in increased deferred revenue and backlog. Under ASC 606, which is effective on January 1, 2018, the license component of these arrangements will be recognized up-front, resulting in increased volatility in the Company's reporting of quarterly and annual revenue. The Company is similarly experiencing a shifting preference from perpetual licenses to time-based licenses across a broader spectrum of its customers, particularly in the more mature geographic markets, such as the U.S. and Japan. To the extent this shift continues or becomes more prevalent, the result could be a near-term adverse impact on software license and maintenance revenue growth.

International and domestic revenues, as a percentage of total revenue, were 61.9% and 38.1%, respectively, during the year ended December 31, 2017, and 62.8% and 37.2%, respectively, during the year ended December 31, 2016. The Company derived 24.8% and 24.4% of its total revenue through the indirect sales channel for the years ended December 31, 2017 and 2016, respectively.

In valuing deferred revenue on the balance sheets of the Company's recent acquisitions as of their respective acquisition dates, the Company applied the fair value provisions applicable to the accounting for business combinations, resulting in a reduction of deferred revenue as compared to its historical carrying amount. As a result, the Company's post-acquisition revenue will be less than the sum of what would have otherwise been reported by ANSYS and each acquiree absent the acquisitions. The impacts on reported revenue for the years ended December 31, 2017 and 2016 were \$2.9 million and \$0.1 million, respectively.

Cost of Sales and Gross Profit:

The table below reflects the Company's operating results as presented on the consolidated statements of income, which are inclusive of foreign currency translation impacts. Amounts included in the discussion that follows are provided in constant currency. The impact, where material, of foreign exchange translation on each expense line is provided separately.

(in thousands, except percentages)	Year Ended December 31,					
	2017		2016		Change	
	Amount	% of Revenue	Amount	% of Revenue	Amount	%
Cost of sales:						
Software licenses	\$ 34,421	3.1	\$ 28,860	2.9	\$ 5,561	19.3
Amortization	36,794	3.4	38,092	3.9	(1,298)	(3.4)
Maintenance and service	78,949	7.2	79,908	8.1	(959)	(1.2)
Total cost of sales	150,164	13.7	146,860	14.9	3,304	2.2
Gross profit	\$ 945,086	86.3	\$ 841,605	85.1	\$ 103,481	12.3

Software Licenses: The increase in the cost of software licenses was primarily due to the following:

- Increased third-party royalties of \$2.9 million.
- Increased salaries and other headcount-related costs of \$1.6 million.
- Increased restructuring costs of \$0.6 million.

Amortization: The decrease in amortization expense was primarily due to a net decrease in the amortization of acquired technology, partially offset by an increase in the amortization of trade names.

Maintenance and Service: The net decrease in maintenance and service costs was primarily due to the following:

- Decreased salaries and other headcount-related costs of \$4.0 million, primarily due to a redeployment of technical personnel resources to pre-sales activities.
- Decreased depreciation and facility costs, each of \$0.6 million.
- Increased third-party technical support of \$2.1 million.
- Increased restructuring costs of \$1.7 million.
- Increased stock-based compensation of \$1.0 million.

The improvement in gross profit was a result of the increase in revenue, partially offset by the increase in the related cost of sales.

Operating Expenses:

The table below reflects the Company's operating results as presented on the consolidated statements of income, which are inclusive of foreign currency translation impacts. Amounts included in the discussion that follows are provided in constant currency. The impact, where material, of foreign exchange translation on each expense line is provided separately.

(in thousands, except percentages)	Year Ended December 31,				Change	
	2017		2016		Amount	%
	Amount	% of Revenue	Amount	% of Revenue		
Operating expenses:						
Selling, general and administrative	\$ 338,640	30.9	\$ 269,515	27.3	\$ 69,125	25.6
Research and development	202,746	18.5	183,093	18.5	19,653	10.7
Amortization	12,972	1.2	12,755	1.3	217	1.7
Total operating expenses	\$ 554,358	50.6	\$ 465,363	47.1	\$ 88,995	19.1

Selling, General and Administrative: The increase in selling, general and administrative costs was primarily due to the following:

- Increased salaries, incentive compensation and other headcount-related costs of \$42.1 million.
- Increased stock-based compensation of \$14.8 million.
- Increased consulting costs of \$7.3 million.

The Company anticipates that it will continue to make targeted investments in its global sales and marketing organizations and its global business infrastructure to enhance and support its revenue-generating activities.

Research and Development: The increase in research and development costs was primarily due to the following:

- Increased salaries, incentive compensation and other headcount-related costs of \$9.6 million.
- Increased restructuring costs of \$6.5 million.
- Increased stock-based compensation of \$3.8 million.

The Company has traditionally invested significant resources in research and development activities and intends to continue to make investments in expanding the ease of use and capabilities of its broad portfolio of simulation software products.

Interest Income: Interest income for the year ended December 31, 2017 was \$7.0 million as compared to \$4.2 million for the year ended December 31, 2016. Interest income increased as a result of an increase in both the Company's average invested cash balances and the average rate of return on those balances.

Other Expense, net: The Company's other expense consists of the following:

(in thousands)	Year Ended December 31,	
	2017	2016
Foreign currency (losses) gains, net	\$ (1,935)	\$ 77
Other	(61)	(213)
Total other expense, net	\$ (1,996)	\$ (136)

Income Tax Provision: The Company recorded income tax expense of \$136.4 million and had income before income taxes of \$395.7 million for the year ended December 31, 2017, representing an effective tax rate of 34.5%. During the year ended December 31, 2016, the Company recorded income tax expense of \$114.7 million and had income before income taxes of \$380.3 million, representing an effective tax rate of 30.2%.

On December 22, 2017, the U.S. government enacted comprehensive tax legislation commonly referred to as the Tax Cuts and Jobs Act (Tax Reform). Tax Reform makes broad and complex changes to the U.S. tax code, including, but not limited to, (1) reducing the U.S. federal corporate tax rate from 35 percent to 21 percent; (2) requiring companies to pay a one-time transition tax on certain unrepatriated earnings of foreign subsidiaries (Transition Tax); (3) generally eliminating U.S. federal income taxes on dividends from foreign subsidiaries; (4) creating a new provision designed to tax global intangible low-taxed income (GILTI) which allows for the possibility of using foreign tax credits (FTCs) and a deduction of up to 50 percent to offset the income tax liability (subject to some limitations); (5) repealing the domestic production activity deduction; (6) creating the base erosion anti-abuse tax, a new minimum tax; (7) allowing for full expensing of qualified property through bonus depreciation; and (8) creating limitations on the deductibility of certain executive compensation.

The SEC staff issued Staff Accounting Bulletin (SAB) 118, which provides guidance on accounting for the tax effects of Tax Reform. SAB 118 provides a measurement period that should not extend beyond one year from enactment for companies to complete the accounting under ASC 740, *Income Taxes*. In accordance with SAB 118, a company must reflect the income tax effects of those aspects of Tax Reform for which the accounting under ASC 740 is complete in the financial statements. To the extent that a company's accounting for certain income tax effects of Tax Reform is incomplete, but a reasonable estimate is able to be made, the company must record a provisional estimate in the financial statements. If a company cannot determine a provisional estimate to be included in the financial statements, it should continue to apply ASC 740 on the basis of the tax laws that were in effect immediately before the enactment of Tax Reform.

In connection with the Company's initial analysis of the impact of Tax Reform, a discrete net tax expense of \$17.9 million was recorded in the period ending December 31, 2017, primarily consisting of \$1.9 million for the revaluation of net deferred tax assets and \$16.0 million for the Transition Tax. In addition to the \$17.9 million charge, the Company would have recognized a \$4.8 million benefit in the fourth quarter related to foreign earnings repatriation, but this benefit was eliminated due to Tax Reform. As further discussed below, the Company was able to complete final or provisional calculations for certain elements of Tax Reform and the amounts and estimates are included in the financial statements. For other elements, the Company was not able to make reasonable estimates and therefore those elements have not been recorded and are accounted for in accordance with ASC 740 on the basis of the tax laws in effect before Tax Reform.

The Company's accounting for the impact of the reduction in the U.S. federal corporate tax rate on the Company's deferred tax assets and liabilities is complete. Tax Reform reduces the corporate tax rate to 21 percent, effective January 1, 2018. Consequently, the Company has recorded a net adjustment to deferred income tax expense of \$1.9 million for the year ended December 31, 2017 to revalue the Company's deferred tax assets and liabilities. The lower statutory rate of 21% will have a favorable impact on the Company's effective tax rate in future years.

The Company's accounting for the Transition Tax is incomplete. However, reasonable estimates of certain effects were able to be calculated and, therefore, a provisional adjustment was recorded. The Transition Tax is a tax on the deemed repatriation of previously untaxed accumulated current earnings and profits (E&P) of certain foreign subsidiaries. To determine the amount of the Transition Tax, the Company must determine, in addition to other factors, the amount of post-1986 E&P of the relevant subsidiaries, as well as the amount of non-U.S. income taxes paid on such earnings. The Company was able to make a reasonable estimate of the Transition Tax and recorded a provisional Transition Tax expense of \$16.0 million. However, the Company will continue to gather additional information to more precisely compute the final amount. The Company plans to elect to pay this liability over eight years and has recorded \$14.5 million of the obligation in other long-term liabilities, with the balance recorded to accrued income taxes.

The Company's accounting for the indefinite reinvestment assertion is incomplete. However, a reasonable estimate of book and tax basis was calculated, and the Company made a provisional assertion. In general, it is the practice and intention of the Company to repatriate previously taxed earnings and to reinvest all other earnings of its non-U.S. subsidiaries. As part of Tax Reform, the Company incurred U.S. tax on substantially all of the earnings of its non-U.S. subsidiaries as part of the Transition Tax. This tax increased the Company's previously taxed earnings and will allow for the repatriation of the majority of its foreign earnings without any residual U.S. federal tax. The Company does not believe that there is an excess of the financial reporting basis over the tax basis of investments in foreign subsidiaries. Accordingly, any repatriation in excess of previously taxed earnings will be a non-taxable return of basis. This assertion is subject to change as additional information is gathered to precisely compute the book and tax basis of the Company's non-U.S. subsidiaries.

The Company's accounting for GILTI is incomplete, and reasonable estimates of the effects are not able to be made. Therefore, no provisional adjustments were recorded. Tax Reform creates a new requirement that GILTI earned by controlled foreign corporations (CFCs) must be included currently in the gross income of the CFCs' U.S. shareholder. GILTI is the excess of the shareholder's "net CFC tested income" over the net deemed tangible income return which is currently defined as the excess of (1) 10 percent of the aggregate of the U.S. shareholder's pro rata share of the qualified business asset investment of each CFC over (2) the amount of certain interest expense taken into account in the determination of net CFC-tested income.

Due to the complexity of the new GILTI tax rules, the Company is continuing to evaluate this provision of Tax Reform and the application of ASC 740. Under U.S. GAAP, the Company is allowed to make an accounting policy choice of either (1) treating taxes due on future U.S. inclusions in taxable income related to GILTI as a current-period expense when incurred (the “period cost method”) or (2) factoring such amounts into the Company’s measurement of its deferred taxes (the “deferred method”). The Company’s selection of an accounting policy with respect to the new GILTI tax rules will depend, in part, on analyzing global income to determine whether future U.S. inclusions in taxable income related to GILTI are expected and, if so, the expected impact. Whether the Company expects to have future U.S. inclusions in taxable income related to GILTI depends not only on the current structure and estimated future results of global operations, but also on the Company’s intent and ability to modify the structure and/or the business. The Company is not yet able to reasonably estimate the effect of this provision of Tax Reform and therefore has not made any adjustments related to potential GILTI tax in the financial statements. In addition, the Company has not made the accounting policy decision regarding whether to record deferred taxes on GILTI or expense taxes as incurred on GILTI.

The increase in the effective tax rate from the prior year is primarily due to tax charges of \$17.9 million related to Tax Reform, partially offset by increased tax benefits of \$13.1 million related to stock-based compensation in 2017. In addition, the 2016 effective tax rate was reduced by entity structuring and related repatriation benefits of \$10.8 million that did not recur in 2017. In the first quarter of 2017, the Company adopted ASU 2016-09, *Compensation - Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting*, which requires excess tax benefits and deficiencies related to stock-based compensation to be reflected in the income statement as a component of the provision for income taxes. Previously, these tax effects were reflected in stockholders' equity.

When compared to the federal and state combined statutory rate, the effective tax rates for the years ended December 31, 2017 and 2016 were favorably impacted by the domestic manufacturing deduction and research and development credits. The rates were also favorably impacted by the recurring item of lower statutory tax rates in many of the Company's foreign jurisdictions.

Net Income: The Company's net income for the year ended December 31, 2017 was \$259.3 million as compared to net income of \$265.6 million for the year ended December 31, 2016. Diluted earnings per share was \$2.98 for the year ended December 31, 2017 and \$2.99 for the year ended December 31, 2016. The weighted average shares used in computing diluted earnings per share were 86.9 million and 89.0 million for the years ended December 31, 2017 and 2016, respectively.

## Year Ended December 31, 2016 Compared to Year Ended December 31, 2015

### Revenue:

<i>(in thousands, except percentages)</i>	Year Ended December 31,		Change	
	2016	2015	Amount	%
<b>Revenue:</b>				
Lease licenses	\$ 340,331	\$ 316,367	\$ 23,964	7.6
Perpetual licenses	227,843	238,738	(10,895)	(4.6)
Software licenses	568,174	555,105	13,069	2.4
Maintenance	394,745	364,591	30,154	8.3
Service	25,546	23,057	2,489	10.8
Maintenance and service	420,291	387,648	32,643	8.4
Total revenue	\$ 988,465	\$ 942,753	\$ 45,712	4.8

The Company's revenue increased 4.8% during the year ended December 31, 2016 as compared to the year ended December 31, 2015, while revenue grew 5.1% in constant currency. The growth rate was favorably impacted by the Company's continued investment in its global sales, support and marketing organizations and was adversely impacted by a recent shift in the licensing preference of certain customers from perpetual licenses to lease licenses. Lease license revenue increased 7.6% as compared to the prior year. Perpetual license revenue, which is derived primarily from new sales, decreased 4.6% as compared to the prior year. Annual maintenance contracts that were sold with new perpetual licenses, along with maintenance contracts sold with new perpetual licenses in previous years, contributed to maintenance revenue growth of 8.3%.

With respect to revenue, on average for the year ended December 31, 2016, the U.S. Dollar was 0.5% stronger, when measured against the Company's primary foreign currencies, than for the year ended December 31, 2015. The table below presents the impacts of currency fluctuations on revenue for the year ended December 31, 2016. Amounts in brackets indicate a net adverse impact from currency fluctuations.

<i>(in thousands)</i>	Year Ended December 31, 2016
Euro	\$ (5,595)
British Pound	(3,935)
South Korean Won	(1,720)
Indian Rupee	(941)
Japanese Yen	10,360
Other	(416)
<b>Total</b>	<b>\$ (2,247)</b>

The net overall stronger U.S. Dollar also resulted in increased operating income of \$0.9 million during the year ended December 31, 2016 as compared to the year ended December 31, 2015.

International and domestic revenues, as a percentage of total revenue, were 62.8% and 37.2%, respectively, during the year ended December 31, 2016, and 62.4% and 37.6%, respectively, during the year ended December 31, 2015. The Company derived 24.4% and 24.2% of its total revenue through the indirect sales channel for the years ended December 31, 2016 and 2015, respectively.

In valuing deferred revenue on the balance sheets of the Company's acquisitions as of their respective acquisition dates, the Company applied the fair value provisions applicable to the accounting for business combinations, resulting in a reduction of deferred revenue as compared to its historical carrying amount. As a result, the Company's post-acquisition revenue is less than the sum of what would have otherwise been reported by ANSYS and each acquiree absent the acquisitions. The impacts on reported revenue for the years ended December 31, 2016 and 2015 were \$0.1 million and \$1.7 million, respectively.

Cost of Sales and Gross Profit:

The table below reflects the Company's operating results as presented on the consolidated statements of income, which are inclusive of foreign currency translation impacts. Amounts included in the discussion that follows are provided in constant currency. The impact, where material, of foreign exchange translation on each expense line is provided separately.

<i>(in thousands, except percentages)</i>	Year Ended December 31,				Change	
	2016		2015		Amount	%
	Amount	% of Revenue	Amount	% of Revenue		
Cost of sales:						
Software licenses	\$ 28,860	2.9	\$ 29,105	3.1	\$ (245)	(0.8)
Amortization	38,092	3.9	38,755	4.1	(663)	(1.7)
Maintenance and service	79,908	8.1	79,386	8.4	522	0.7
Total cost of sales	146,860	14.9	147,246	15.6	(386)	(0.3)
Gross profit	\$ 841,605	85.1	\$ 795,507	84.4	\$ 46,098	5.8

Software Licenses: Contributing to the minimal change in costs of software were the following two offsetting factors:

- Decreased salaries and other headcount-related costs of \$1.2 million, primarily due to a decrease in headcount.
- Increased third-party royalties of \$1.2 million.

Amortization: The net decrease in amortization expense was primarily due to a net decrease in the amortization of acquired technology, partially offset by a net increase in the amortization of trade names.

Maintenance and Service: The net increase in maintenance and service costs was primarily due to the following:

- Net increase in salaries, incentive compensation and other headcount-related costs of \$3.5 million.
- Increased IT-related maintenance and software hosting costs of \$0.5 million.
- Decreased depreciation and severance costs, each of \$0.7 million.
- Decreased facility costs of \$0.4 million.
- Cost reduction related to foreign exchange translation of \$0.4 million due to a stronger U.S. Dollar.
- Decreased business travel and stock-based compensation, each of \$0.3 million.

The improvement in gross profit was a result of the increase in revenue and decrease in related cost of sales.



Operating Expenses:

The table below reflects the Company's operating results as presented on the consolidated statements of income, which are inclusive of foreign currency translation impacts. Amounts included in the discussion that follows are provided in constant currency. The impact, where material, of foreign exchange translation on each expense line is provided separately.

<i>(in thousands, except percentages)</i>	Year Ended December 31,				Change	
	2016		2015		Amount	%
	Amount	% of Revenue	Amount	% of Revenue		
Operating expenses:						
Selling, general and administrative	\$ 269,515	27.3	\$ 253,603	26.9	\$ 15,912	6.3
Research and development	183,093	18.5	168,831	17.9	14,262	8.4
Amortization	12,755	1.3	19,394	2.1	(6,639)	(34.2)
Total operating expenses	\$ 465,363	47.1	\$ 441,828	46.9	\$ 23,535	5.3

Selling, General and Administrative: The increase in selling, general and administrative costs was primarily due to the following:

- \$4.7 million of costs associated with an employment-related settlement agreement.
- Increased severance costs of \$3.2 million.
- Net increase in salaries, incentive compensation and other headcount-related costs of \$2.1 million.
- Increased IT-related maintenance and software hosting costs of \$2.1 million.
- Increased government charges and taxes of \$1.4 million.
- Increased marketing costs of \$1.2 million.

Research and Development: The net increase in research and development costs was primarily due to the following:

- Increased salaries, incentive compensation and other headcount-related costs of \$10.6 million.
- Increased IT-related maintenance and software hosting costs of \$2.1 million.
- Increased stock-based compensation of \$0.9 million.
- Cost reduction due to foreign exchange translation of \$1.6 million.

Amortization: The decrease in amortization expense was primarily due to a decrease in the amortization of acquired customer lists that became fully amortized.

Interest Income: Interest income for the year ended December 31, 2016 was \$4.2 million as compared to \$2.8 million for the year ended December 31, 2015. Interest income increased as a result of an increase in both the Company's average invested cash balances and the average rate of return on those balances.

Other (Expense) Income, net: The Company's other (expense) income consists of the following:

<i>(in thousands)</i>	Year Ended December 31,	
	2016	2015
Foreign currency gains, net	\$ 77	\$ 486
Other	(213)	(229)
Total other (expense) income, net	\$ (136)	\$ 257

Income Tax Provision: The Company recorded income tax expense of \$114.7 million and had income before income taxes of \$380.3 million for the year ended December 31, 2016, representing an effective tax rate of 30.2%. During the year ended December 31, 2015, the Company recorded income tax expense of \$104.2 million and had income before income taxes of \$356.8 million, representing an effective tax rate of 29.2%.

The increase in the effective tax rate from the prior year is primarily due to tax benefits related to the merger of the Company's Japan subsidiaries in 2010 recognized in 2015 that did not recur in 2016, partially offset by tax benefits from restructuring activities in 2016. When compared to the federal and state combined statutory rate, the effective tax rates for the years ended December 31, 2016 and 2015 were favorably impacted by the domestic manufacturing deduction and research and development credits. The quarterly benefit of approximately \$3.1 million associated with the merger of the Company's Japan subsidiaries was fully amortized in the third quarter of 2015. There will be no additional ongoing benefit from this transaction. The rates were also favorably impacted by the recurring item of lower statutory tax rates in many of the Company's foreign jurisdictions.

Net Income: The Company's net income for the year ended December 31, 2016 was \$265.6 million as compared to net income of \$252.5 million for the year ended December 31, 2015. Diluted earnings per share was \$2.99 for the year ended December 31, 2016 and \$2.76 for the year ended December 31, 2015. The weighted average shares used in computing diluted earnings per share were 89.0 million and 91.5 million for the years ended December 31, 2016 and 2015, respectively.

## Non-GAAP Results

The Company provides non-GAAP revenue, non-GAAP operating income, non-GAAP operating profit margin, non-GAAP net income and non-GAAP diluted earnings per share as supplemental measures to GAAP regarding the Company's operational performance. These financial measures exclude the impact of certain items and, therefore, have not been calculated in accordance with GAAP. A detailed explanation and a reconciliation of each non-GAAP financial measure to its most comparable GAAP financial measure are described below.

<i>(in thousands, except percentages and per share data)</i>	Year Ended December 31,					
	2017			2016		
	As Reported	Adjustments	Non-GAAP Results	As Reported	Adjustments	Non-GAAP Results
Total revenue	\$1,095,250	\$ 2,856 (1)	\$1,098,106	\$988,465	\$ 103 (4)	\$988,568
Operating income	390,728	118,567 (2)	509,295	376,242	88,114 (5)	464,356
Operating profit margin	35.7%		46.4%	38.1%		47.0%
Net income	\$ 259,251	\$ 88,663 (3)	\$ 347,914	\$ 265,636	\$ 57,286 (6)	\$ 322,922
Earnings per share – diluted:						
Earnings per share	\$ 2.98		\$ 4.01	\$ 2.99		\$ 3.63
Weighted average shares	86,854		86,854	88,969		88,969

- (1) Amount represents the revenue not reported during the period as a result of the acquisition accounting adjustment associated with the accounting for deferred revenue in business combinations.
- (2) Amount represents \$53.2 million of stock-based compensation expense, \$49.8 million of amortization expense associated with intangible assets acquired in business combinations, \$11.7 million of restructuring charges, \$1.1 million of transaction expenses related to business combinations and the \$2.9 million adjustment to revenue as reflected in (1) above.
- (3) Amount represents the impact of the adjustments to operating income referred to in (2) above, decreased for the related income tax impact of \$52.5 million, excluding the impact of the Tax Cuts and Jobs Act, and rabbi trust income of \$0.1 million, and increased for total net impacts of the Tax Cuts and Jobs Act of \$22.7 million.
- (4) Amount represents the revenue not reported during the period as a result of the acquisition accounting adjustment associated with the accounting for deferred revenue in business combinations.
- (5) Amount represents \$50.8 million of amortization expense associated with intangible assets acquired in business combinations, \$33.3 million of stock-based compensation expense, \$3.4 million of restructuring charges, \$0.4 million of transaction expenses related to business combinations and the \$0.1 million adjustment to revenue as reflected in (4) above.
- (6) Amount represents the impact of the adjustments to operating income referred to in (5) above, adjusted for the related income tax impact of \$30.8 million.

<i>(in thousands, except percentages and per share data)</i>	Year Ended December 31,					
	2016			2015		
	As Reported	Adjustments	Non-GAAP Results	As Reported	Adjustments	Non-GAAP Results
Total revenue	\$988,465	\$ 103 (1)	\$988,568	\$942,753	\$ 1,725 (4)	\$944,478
Operating income	376,242	88,114 (2)	464,356	353,679	94,665 (5)	448,344
Operating profit margin	38.1%		47.0%	37.5%		47.5%
Net income	\$265,636	\$ 57,286 (3)	\$322,922	\$252,521	\$ 60,854 (6)	\$313,375
Earnings per share – diluted:						
Earnings per share	\$ 2.99		\$ 3.63	\$ 2.76		\$ 3.42
Weighted average shares	88,969		88,969	91,502		91,502

- (1) Amount represents the revenue not reported during the period as a result of the acquisition accounting adjustment associated with the accounting for deferred revenue in business combinations.
- (2) Amount represents \$50.8 million of amortization expense associated with intangible assets acquired in business combinations, \$33.3 million of stock-based compensation expense, the \$0.1 million adjustment to revenue as reflected in (1) above, \$3.4 million of restructuring charges and \$0.4 million of transaction expenses related to business combinations.
- (3) Amount represents the impact of the adjustments to operating income referred to in (2) above, adjusted for the related income tax impact of \$30.8 million.
- (4) Amount represents the revenue not reported during the period as a result of the acquisition accounting adjustment associated with the accounting for deferred revenue in business combinations.
- (5) Amount represents \$58.1 million of amortization expense associated with intangible assets acquired in business combinations, \$34.0 million of stock-based compensation expense, the \$1.7 million adjustment to revenue as reflected in (4) above and \$0.8 million of transaction expenses related to business combinations.
- (6) Amount represents the impact of the adjustments to operating income referred to in (5) above, adjusted for the related income tax impact of \$33.8 million.

### Non-GAAP Measures

Management uses non-GAAP financial measures (a) to evaluate the Company's historical and prospective financial performance as well as its performance relative to its competitors, (b) to set internal sales targets and spending budgets, (c) to allocate resources, (d) to measure operational profitability and the accuracy of forecasting, (e) to assess financial discipline over operational expenditures and (f) as an important factor in determining variable compensation for management and its employees. In addition, many financial analysts that follow the Company focus on and publish both historical results and future projections based on non-GAAP financial measures. The Company believes that it is in the best interest of its investors to provide this information to analysts so that they accurately report the non-GAAP financial information. Moreover, investors have historically requested and the Company has historically reported these non-GAAP financial measures as a means of providing consistent and comparable information with past reports of financial results.

While management believes that these non-GAAP financial measures provide useful supplemental information to investors, there are limitations associated with the use of these non-GAAP financial measures. These non-GAAP financial measures are not prepared in accordance with GAAP, are not reported by all of the Company's competitors and may not be directly comparable to similarly titled measures of the Company's competitors due to potential differences in the exact method of calculation. The Company compensates for these limitations by using these non-GAAP financial measures as supplements to GAAP financial measures and by reviewing the reconciliations of the non-GAAP financial measures to their most comparable GAAP financial measures.

The adjustments to these non-GAAP financial measures, and the basis for such adjustments, are outlined below:

**Acquisition accounting for deferred revenue and its related tax impact.** Historically, the Company has consummated acquisitions in order to support its strategic and other business objectives. In accordance with the fair value provisions applicable to the accounting for business combinations, acquired deferred revenue is often recorded on the opening balance sheet at an amount that is lower than the historical carrying value. Although this acquisition accounting requirement has no impact on the Company's business or cash flow, it adversely impacts the Company's reported GAAP revenue in the reporting periods following an acquisition. In order to provide investors with financial information that facilitates comparison of both historical and future results, the Company provides non-GAAP financial measures which exclude the impact of the acquisition accounting adjustment. The Company believes that this non-GAAP financial adjustment is useful to investors because it allows investors to (a) evaluate the effectiveness of the methodology and information used by management in its financial and operational decision-making, and (b) compare past and future reports of financial results of the Company as the revenue reduction related to acquired deferred revenue will not recur when related annual lease licenses and software maintenance contracts are renewed in future periods.

**Amortization of intangible assets from acquisitions and its related tax impact.** The Company incurs amortization of intangible assets, included in its GAAP presentation of amortization expense, related to various acquisitions it has made. Management excludes these expenses and their related tax impact for the purpose of calculating non-GAAP operating income, non-GAAP operating profit margin, non-GAAP net income and non-GAAP diluted earnings per share when it evaluates the continuing operational performance of the Company because these costs are fixed at the time of an acquisition, are then amortized over a period of several years after the acquisition and generally cannot be changed or influenced by management after the acquisition. Accordingly, management does not consider these expenses for purposes of evaluating the performance of the Company during the applicable time period after the acquisition, and it excludes such expenses when making decisions to allocate resources. The Company believes that these non-GAAP financial measures are useful to investors because they allow investors to (a) evaluate the effectiveness of the methodology and information used by management in its financial and operational decision-making, and (b) compare past reports of financial results of the Company as the Company has historically reported these non-GAAP financial measures.

**Stock-based compensation expense and its related tax impact.** The Company incurs expense related to stock-based compensation included in its GAAP presentation of cost of software licenses; cost of maintenance and service; research and development expense; and selling, general and administrative expense. Stock-based compensation expense (benefit) incurred in connection with the Company's deferred compensation plan held in a rabbi trust includes an offsetting benefit (charge) recorded in other income (expense). Although stock-based compensation is an expense of the Company and viewed as a form of compensation, management excludes these expenses for the purpose of calculating non-GAAP operating income, non-GAAP operating profit margin, non-GAAP net income and non-GAAP diluted earnings per share when it evaluates the continuing operational performance of the Company. Management similarly excludes income (expense) related to assets held in a rabbi trust in connection with the Company's deferred compensation plan. Specifically, the Company excludes stock-based compensation and income related to assets held in the deferred compensation plan rabbi trust during its annual budgeting process and its quarterly and annual assessments of the Company's and management's performance. The annual budgeting process is the primary mechanism whereby the Company allocates resources to various initiatives and operational requirements. Additionally, the annual review by the board of directors during which it compares the Company's historical business model and profitability to the planned business model and profitability for the forthcoming year excludes the impact of stock-based compensation. In evaluating the performance of senior management and department managers, charges related to stock-based compensation are excluded from expenditure and profitability results. In fact, the Company records stock-based compensation expense into a stand-alone cost center for which no single operational manager is responsible or accountable. In this way, management is able to review, on a period-to-period basis, each manager's performance and assess financial discipline over operational expenditures without the effect of stock-based compensation. The Company believes that these non-GAAP financial measures are useful to investors because they allow investors to (a) evaluate the Company's operating results and the effectiveness of the methodology used by management to review the Company's operating results, and (b) review historical comparability in the Company's financial reporting as well as comparability with competitors' operating results.

**Restructuring charges and the related tax impact.** The Company occasionally incurs expenses for restructuring its workforce included in its GAAP presentation of cost of software licenses; cost of maintenance and service; research and development expense; and selling, general and administrative expense. Management excludes these expenses for the purpose of calculating non-GAAP operating income, non-GAAP operating profit margin, non-GAAP net income and non-GAAP diluted earnings per share when it evaluates the continuing operational performance of the Company, as it generally does not incur these expenses as a part of its operations. The Company believes that these non-GAAP financial measures are useful to investors because they allow investors to (a) evaluate the Company's operating results and the effectiveness of the methodology used by management to review the Company's operating results, and (b) review historical comparability in the Company's financial reporting as well as comparability with competitors' operating results.

**Transaction costs related to business combinations.** The Company incurs expenses for professional services rendered in connection with business combinations, which are included in its GAAP presentation of research and development expense and selling, general and administrative expense. These expenses are generally not tax-deductible. Management excludes these acquisition-related transaction expenses, derived from closed acquisitions, for the purpose of calculating non-GAAP operating income, non-GAAP operating profit margin, non-GAAP net income and non-GAAP diluted earnings per share when it evaluates the continuing operational performance of the Company, as it generally would not have otherwise incurred these expenses in the periods presented as a part of its operations. The Company believes that these non-GAAP financial measures are useful to investors because they allow investors to (a) evaluate the Company's operating results and the effectiveness of the methodology used by management to review the Company's operating results, and (b) review historical comparability in the Company's financial reporting as well as comparability with competitors' operating results.

**Tax Cuts and Jobs Act.** The Company recorded charges in its income tax provision related to the enactment of the Tax Cuts and Jobs Act, including charges for the transition tax related to unrepatriated cash and the impacts of the tax rate change on net deferred tax assets. In addition, the Company was not able to realize a tax benefit related to foreign earnings repatriation due to the enactment of the Tax Cuts and Jobs Act. Management excludes these charges and the unrealized benefit for the purpose of calculating non-GAAP net income and non-GAAP diluted earnings per share when it evaluates the continuing operational performance of the Company, as (i) the charges are not expected to recur as part of its normal operations and (ii) both the charges and unrealized tax benefit resulted from the extremely infrequent event of major U.S. tax reform, the last such reform having occurred in 1986. The Company believes that these non-GAAP financial measures are useful to investors because they allow investors to (a) evaluate the Company's operating results and the effectiveness of the methodology used by management to review the Company's operating results, and (b) review historical comparability in the Company's financial reporting.

Non-GAAP financial measures are not in accordance with, or an alternative for, GAAP. The Company's non-GAAP financial measures are not meant to be considered in isolation or as a substitute for comparable GAAP financial measures, and should be read only in conjunction with the Company's consolidated financial statements prepared in accordance with GAAP.

The Company has provided a reconciliation of the non-GAAP financial measures to the most directly comparable GAAP financial measures as listed below:

**GAAP Reporting Measure**

Revenue

Operating Income

Operating Profit Margin

Net Income

Diluted Earnings Per Share

**Non-GAAP Reporting Measure**

Non-GAAP Revenue

Non-GAAP Operating Income

Non-GAAP Operating Profit Margin

Non-GAAP Net Income

Non-GAAP Diluted Earnings Per Share

## Liquidity and Capital Resources

<i>(in thousands, except percentages)</i>	As of December 31,		Change	
	2017	2016	Amount	%
Cash, cash equivalents and short-term investments	\$ 881,787	\$ 822,860	\$ 58,927	7.2
Working capital	\$ 661,713	\$ 630,301	\$ 31,412	5.0

### *Cash, Cash Equivalents and Short-Term Investments*

Cash and cash equivalents consist primarily of highly liquid investments such as money market funds and deposits held at major banks. Short-term investments consist primarily of deposits held by certain foreign subsidiaries of the Company with original maturities of three months to one year. The following table presents the Company's foreign and domestic holdings of cash, cash equivalents and short-term investments:

<i>(in thousands, except percentages)</i>	As of December 31,			
	2017	% of Total	2016	% of Total
Domestic	\$ 561,417	63.7	\$ 593,348	72.1
Foreign	320,370	36.3	229,512	27.9
Total	\$ 881,787		\$ 822,860	

In general, it is the practice and intention of the Company to repatriate previously taxed earnings and to reinvest all other earnings of its non-U.S. subsidiaries. As part of the Tax Cuts and Jobs Act enacted in the United States in 2017, the Company incurred U.S. tax on substantially all of the earnings of its non-U.S. subsidiaries. The Company recorded a provisional adjustment for the Transition Tax. This tax increased the Company's previously taxed earnings and will allow for the repatriation of the majority of its foreign earnings without any residual U.S. federal tax. The Company does not believe that there is an excess of the financial reporting basis over the tax basis of investments in foreign subsidiaries. Accordingly, any repatriation in excess of previously taxed earnings will be a non-taxable return of basis.

The amount of cash, cash equivalents and short-term investments held by foreign subsidiaries is subject to translation adjustments caused by changes in foreign currency exchange rates as of the end of each respective reporting period, the offset to which is recorded in accumulated other comprehensive loss on the Company's consolidated balance sheet.

### *Cash Flows from Operating Activities*

<i>(in thousands)</i>	Year Ended December 31,			Change	
	2017	2016	2015	2017 vs. 2016	2016 vs. 2015
Net cash provided by operating activities	\$ 430,438	\$ 365,980	\$ 375,699	\$ 64,458	\$ (9,719)

#### *Fiscal year 2017 as compared to fiscal year 2016*

Net cash provided by operating activities increased during the current fiscal year due to increased net cash flows from operating assets and liabilities of \$46.5 million and increased net income (net of non-cash operating adjustments) of \$17.9 million.

#### *Fiscal year 2016 as compared to fiscal year 2015*

Net cash provided by operating activities decreased during the prior fiscal year due to decreased net cash flows from operating assets and liabilities of \$19.0 million, partially offset by increased net income (net of non-cash operating adjustments) of \$9.3 million. The Company experienced an increase in net tax payments of \$8.5 million in 2016 as compared to 2015 as 2016 benefited less from prior year overpayments.

### Cash Flows from Investing Activities

<i>(in thousands)</i>	Year Ended December 31,			Change	
	2017	2016	2015	2017 vs. 2016	2016 vs. 2015
Net cash used in investing activities	\$ (97,443)	\$ (32,173)	\$ (62,032)	\$ (65,270)	\$ 29,859

#### *Fiscal year 2017 as compared to fiscal year 2016*

Net cash used in investing activities increased during the current fiscal year due to increased acquisition-related net cash outlays of \$56.0 million and increased capital expenditures of \$6.7 million. The Company currently plans capital spending of \$22 million to \$27 million during fiscal year 2018 as compared to the \$19.1 million that was spent in 2017. The level of spending will be dependent upon various factors, including growth of the business and general economic conditions.

#### *Fiscal year 2016 as compared to fiscal year 2015*

Net cash used in investing activities decreased during the prior fiscal year due to decreased acquisition-related net cash outlays of \$38.2 million and decreased capital expenditures of \$3.7 million, partially offset by increased net cash outlays of \$12.1 million for other investing activities.

### Cash Flows from Financing Activities:

<i>(in thousands)</i>	Year Ended December 31,			Change	
	2017	2016	2015	2017 vs. 2016	2016 vs. 2015
Net cash used in financing activities	\$ (294,651)	\$ (288,630)	\$ (299,927)	\$ (6,021)	\$ 11,297

#### *Fiscal year 2017 as compared to fiscal year 2016*

Net cash used in financing activities increased during the current fiscal year due primarily to increased restricted stock withholding taxes paid in lieu of issued shares of \$6.1 million.

#### *Fiscal year 2016 as compared to fiscal year 2015*

Net cash used in financing activities decreased during the prior fiscal year due primarily to increased proceeds from shares issued for stock-based compensation of \$10.2 million.

### Other Cash Flow Information

The Company believes that existing cash and cash equivalent balances of \$881.5 million, together with cash generated from operations, will be sufficient to meet the Company's working capital and capital expenditure requirements through the next twelve months. The Company's cash requirements in the future may also be financed through additional equity or debt financings. There can be no assurance that such financings can be obtained on favorable terms, if at all.

Under the Company's stock repurchase program, the Company repurchased shares as follows:

<i>(in thousands, except per share data)</i>	Year Ended December 31,		
	2017	2016	2015
Number of shares repurchased	2,750	3,700	3,833
Average price paid per share	\$ 122.20	\$ 90.90	\$ 88.16
Total cost	\$ 336,042	\$ 336,335	\$ 337,910

In February 2018, the Company's Board of Directors increased the number of shares authorized for repurchase to a total of 5.0 million shares under the stock repurchase program. As of December 31, 2017, 2.8 million shares remained available for repurchase under the program.



The Company continues to generate positive cash flows from operating activities and believes that the best uses of its excess cash are to invest in the business and repurchase stock in order to both offset dilution and return capital, in excess of its requirements, to stockholders with the goal of increasing stockholder value. Additionally, the Company has in the past, and expects in the future, to acquire or make investments in complementary companies, products, services and technologies. Any future acquisitions may be funded by available cash and investments, cash generated from operations, credit facilities, or the issuance of additional securities.

#### **Off-Balance-Sheet Arrangements**

The Company does not have any special-purpose entities or off-balance-sheet financing.

## Contractual Obligations

The Company's significant contractual obligations as of December 31, 2017 are summarized below:

<i>(in thousands)</i>	Payments Due by Period				
	Total	Within 1 year	2 – 3 years	4 – 5 years	After 5 years
Global headquarters operating lease <sup>(1)</sup>	\$ 36,581	\$ 4,278	\$ 8,742	\$ 8,928	\$ 14,633
Other operating leases <sup>(2)</sup>	30,064	10,884	12,112	5,802	1,266
Unconditional purchase obligations <sup>(3)</sup>	51,930	22,408	24,977	4,545	—
Obligations related to uncertain tax positions, including interest and penalties <sup>(4)</sup>	2	2	—	—	—
Other long-term obligations <sup>(5)</sup>	31,432	5,064	7,101	4,345	14,922
Total contractual obligations	<u>\$ 150,009</u>	<u>\$ 42,636</u>	<u>\$ 52,932</u>	<u>\$ 23,620</u>	<u>\$ 30,821</u>

- (1) The Company previously entered into a lease agreement for 186,000 square feet of rentable space located in an office facility in Canonsburg, Pennsylvania, which serves as the Company's headquarters. The term of the lease is 183 months, beginning on October 1, 2014 and expiring on December 31, 2029. The Company has a one-time right to terminate the lease effective upon the last day of the tenth full year following the date of possession (December 31, 2024) by providing the landlord with at least 18 months' prior written notice of such termination.
- (2) Other operating leases primarily include noncancellable lease commitments for the Company's other domestic and international offices as well as certain operating equipment.
- (3) Unconditional purchase obligations primarily include royalties, software licenses and long-term purchase contracts for network, communication and office maintenance services, which are unrecorded as of December 31, 2017.
- (4) The Company has \$24.8 million of unrecognized tax benefits, including estimated interest and penalties, that have been recorded as liabilities in accordance with income tax accounting guidance for which the Company is uncertain as to if or when such amounts may be settled. As a result, such amounts are excluded from the table above.
- (5) Other long-term obligations primarily include federal transition tax related to Tax Reform of \$15.7 million, post-employment benefits, including pension obligations, of \$8.1 million for certain foreign locations of the Company and deferred compensation of \$3.3 million (including estimated imputed interest of \$87,000 within 1 year). These amounts include the related current portions when applicable.

## Critical Accounting Policies and Estimates

The Company believes that the following critical accounting policies affect the more significant judgments and estimates used in the preparation of its consolidated financial statements.

*Revenue Recognition:* Revenue is derived principally from the licensing of computer software products and from related maintenance contracts. Revenue from perpetual licenses is classified as license revenue and is recognized upon delivery of the licensed product and the utility that enables the customer to access authorization keys, provided that acceptance has occurred and a signed contractual obligation has been received, the price is fixed and determinable, and collectibility of the receivable is probable. The Company determines the fair value of post-contract customer support (PCS) sold together with perpetual licenses based on the rate charged for PCS when sold separately. Revenue from PCS contracts is classified as maintenance and service revenue and is recognized ratably over the term of the contract.

Revenue for software lease licenses is classified as license revenue and is recognized over the period of the lease contract. Typically, the Company's software leases include PCS which, due to the short term (principally one year or less) of the Company's software lease licenses, is not separated from lease revenue for accounting purposes. Both the lease licenses and PCS are recognized ratably over the lease period. The Company includes the revenue for the entire lease arrangement within software license revenue in the consolidated statements of income.

Many of the Company's semiconductor products are typically licensed via longer term leases of 24–36 months. The Company recognizes revenue for these licenses over the term of the lease contract. Because the Company does not have vendor-specific objective evidence of the fair value of these leases, the Company also recognizes revenue from perpetual licenses over the term of the lease contract during the infrequent occurrence of these licenses being sold with semiconductor leases in multiple-element arrangements.

Revenue from training, support and other services is recognized as the services are performed. The Company applies the specific performance method to contracts in which the service consists of a single act, such as providing a training class to a customer, and the proportional performance method to other service contracts that are longer in duration and often include multiple acts (for example, both training and consulting). In applying the proportional performance method, the Company typically utilizes output-based estimates for services with contractual billing arrangements that are not based on time and materials, and estimates output based on the total tasks completed as compared to the total tasks required for each work contract. Input-based estimates are utilized for services that involve general consultations with contractual billing arrangements based on time and materials, utilizing direct labor as the input measure.

The Company also executes arrangements through independent channel partners in which the channel partners are authorized to market and distribute the Company's software products to end users of the Company's products and services in specified territories. In sales facilitated by channel partners, the channel partner bears the risk of collection from the end-user customer. The Company recognizes revenue from transactions with channel partners when the channel partner submits a written purchase commitment, collectibility from the channel partner is probable, a license agreement signed by the end-user customer is received and delivery has occurred, provided that all other revenue recognition criteria are satisfied. Revenue from channel partner transactions is the amount remitted to the Company by the channel partners. This amount includes a fee for PCS that is compensation for providing technical enhancements and the second level of technical support to the end user, which is based on the rate charged for PCS when sold separately, and is recognized over the period that PCS is to be provided. The Company does not offer right of return, product rotation or price protection to any of its channel partners.

Non-income-related taxes collected from customers and remitted to governmental authorities are recorded on the consolidated balance sheet as accounts receivable and accrued expenses. The collection and payment of these amounts are reported on a net basis in the consolidated statements of income and do not impact reported revenues or expenses.

The Company warrants to its customers that its software will substantially perform as specified in the Company's current user manuals. The Company has not experienced significant claims related to software warranties beyond the scope of maintenance support, which the Company is already obligated to provide. Consequently, the Company has not established reserves for warranty obligations.

The Company's agreements with its customers generally require it to indemnify the customer against claims that the Company's software infringes third-party patent, copyright, trademark or other proprietary rights. Such indemnification obligations are generally limited in a variety of industry-standard respects, including the Company's right to replace an infringing product. As of December 31, 2017, the Company had not experienced any losses related to these indemnification obligations and no claims with respect thereto were outstanding. The Company does not expect significant claims related to these indemnification obligations, and, consequently, the Company has not established any related reserves.

*Allowance for Doubtful Accounts:* The Company makes judgments as to its ability to collect outstanding receivables and provides allowances for a portion of receivables when collection becomes doubtful. Provisions are made based upon a specific review of all significant outstanding invoices from both value and delinquency perspectives. For those invoices not specifically reviewed, provisions are provided at differing rates based upon the age of the receivable and the geographic area of origin. In determining these percentages, the Company considers its historical collection experience and current economic trends in the customer's industry and geographic region. If the historical data used to calculate the allowance for doubtful accounts does not reflect the future ability to collect outstanding receivables, additional provisions for doubtful accounts may be needed and future results of operations could be materially affected.

*Income Taxes:* The Company accounts for income taxes under the asset and liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements. Under this method, deferred tax assets and liabilities are determined based on the differences between the financial statement and tax bases of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. The effect of a change in tax rates on deferred tax assets and liabilities is recognized in income in the period of the enactment date.

The Company records net deferred tax assets to the extent it believes these assets will more likely than not be realized. In making such determination, the Company considers all available positive and negative evidence, including scheduled reversals of deferred tax liabilities, projected future taxable income, tax planning strategies and recent financial operations. In the event the Company determines that it will be able to realize deferred tax assets for which a valuation allowance was used to reduce their carrying value, the adjustment to the valuation allowance will be recorded as a reduction to the provision for income taxes.

Tax benefits related to uncertain tax positions taken or expected to be taken on a tax return are recorded when such benefits meet a more-likely-than-not threshold. Otherwise, these tax benefits are recorded when a tax position has been effectively settled, which means that the statute of limitations has expired or the appropriate taxing authority has completed their examination even though the statute of limitations remains open. The Company recognizes interest and penalties related to income taxes within the income tax expense line in the consolidated statements of income. Accrued interest and penalties are included within the related tax liability line in the consolidated balance sheets.

*Goodwill and Indefinite-Lived Intangible Assets:* The Company tests goodwill and indefinite-lived intangible assets for impairment at least annually by performing a quantitative assessment of whether the fair value of each reporting unit or asset exceeds its carrying amount. Goodwill is tested at the reporting unit level and indefinite-lived intangible assets are tested at the individual asset level. This requires the Company to assess and make judgments regarding a variety of factors which impact the fair value of the reporting unit or asset being tested, including business plans, anticipated future cash flows, economic projections and other market data. Because there are inherent uncertainties involved in these factors, significant differences between these estimates and actual results could result in future impairment charges and could materially impact the Company's future financial results. During the first quarter of 2017, the Company completed the annual impairment test for goodwill and the indefinite-lived intangible asset and determined that these assets had not been impaired as of the test date, January 1, 2017. No other events or circumstances changed during the year ended December 31, 2017 that would indicate that the fair values of the Company's reporting unit and indefinite-lived intangible asset are below their carrying values.

*Contingencies:* The Company is involved in various investigations, claims and legal proceedings that arise in the ordinary course of business, including commercial disputes, labor and employment matters, tax audits, alleged infringement of intellectual property rights and other matters. The Company reviews the status of these matters, assesses its financial exposure and records a related accrual if the potential loss from an investigation, claim or legal proceeding is probable and the amount is reasonably estimable. Significant judgment is involved in the determination of probability and in the determination of whether an exposure is reasonably estimable. As a result of the uncertainties involved in making these estimates, the Company may have to revise its estimates as facts and circumstances change. The revision of these estimates could have a material impact on the Company's financial position and results of operations.

*Stock-Based Compensation:* The Company grants restricted stock units and other stock awards to employees and directors under the Company's stock option and grant plan. Eligible employees can also purchase shares of the Company's common stock at a discount under the Company's employee stock purchase plan. The benefits provided under these plans are share-based payments subject to the provisions of share-based payment accounting guidance. The Company uses the fair value method to apply the provisions of share-based payment accounting guidance. Stock-based compensation expense for 2017, 2016 and 2015 was \$53.2 million, \$33.3 million and \$34.0 million, respectively. As of December 31, 2017, total unrecognized estimated compensation expense related to unvested stock options and awards granted prior to that date was \$107.7 million, which is expected to be recognized over a weighted-average period of 1.9 years.

The value of each stock option award was estimated on the date of grant, or date of acquisition for options issued in a business combination, using the Black-Scholes option pricing model (Black-Scholes model). The determination of the fair value of share-based payment awards using an option pricing model is affected by the Company's stock price as well as assumptions regarding a number of complex and subjective variables. These variables include the Company's expected stock price volatility over the term of the awards, actual and projected employee stock option exercise behaviors, risk-free interest rates and expected dividends. The table below presents the weighted-average input assumptions used and resulting fair values for options granted or issued in business combinations during each respective year. The stock-based compensation expense for options is recorded ratably over the requisite service period. The interest rate assumptions were determined by using the five-year U.S. Treasury Note yield on the date of grant or date of acquisition. The Company did not grant stock option awards during 2017.

	Year Ended December 31,	
	2016	2015
Risk-free interest rate	1.19% to 1.93%	1.18% to 1.65%
Expected dividend yield	—%	—%
Expected volatility	24%	25%
Expected term	5.7 years	5.6 years
Weighted-average fair value per share	\$23.96	\$30.83

The Company issues various restricted stock awards which contain a market condition, a performance condition, a service condition, or any combination of the three. Restricted stock awards are valued based on the grant-date fair value of the award. Stock-based compensation expense is recognized over the employee's requisite service period for awards with only a service condition. For awards with a performance condition, stock-based compensation expense is recorded from the service inception date through the conclusion of the measurement period based on management's estimates concerning the probability of vesting.

Vesting of restricted stock awards with a market condition is based on the Company's performance as measured by total shareholder return relative to the appreciation of a specified stock index over the measurement period, subject to each participant's continued employment with the Company through the conclusion of the measurement period. The fair value of the restricted stock awards with a market condition is estimated using a Monte Carlo simulation model. The determination of the fair value of the awards is affected by the grant date and a number of variables, each of which has been identified in the chart below for awards granted during each respective period. Share-based compensation expense based on the fair value of the award is being recorded from the grant date through the conclusion of the measurement period.

Assumptions used in Monte Carlo lattice pricing model	Year Ended December 31,		
	2017	2016	2015
Risk-free interest rate	1.5%	1.0%	1.1%
Expected dividend yield	—%	—%	—%
Expected volatility—ANSYS stock price	19%	21%	23%
Expected volatility—NASDAQ Composite Index	15%	16%	14%
Expected term	2.8 years	2.8 years	2.8 years
Correlation factor	0.70	0.65	0.60
Weighted-average fair value per share	\$120.94	\$78.71	\$81.61

The Company also grants deferred stock awards to non-affiliate Independent Directors, which are rights to receive shares of common stock upon termination of service as a Director. In 2015 and prior, the deferred stock awards were issued quarterly in arrears and vested immediately upon grant. Starting in 2016, the Company issued the deferred stock awards immediately, but the awards vest in full on the one-year anniversary of the grant.

To the extent the Company changes the terms of its stock-based compensation programs, experiences market volatility in the pricing of its common stock that increases the implied volatility assumption used in the Black-Scholes model, refines different assumptions, or assumes stock awards from acquired companies that are different in nature than the Company's stock award arrangements, among other potential impacts, the stock-based compensation expense recorded in future periods and the related tax benefits may differ significantly from what was recorded in previous reporting periods. The Company accounts for forfeitures of stock-based awards as they occur.

Estimates of stock-based compensation expense are significant to the Company's financial statements, but this expense is partially based on the aforementioned option valuation and Monte Carlo simulation models and will never result in the payment of cash by the Company. For this reason, and because the Company does not view stock-based compensation as related to its

operational performance, the Board of Directors and management exclude stock-based compensation expense when evaluating the Company's underlying business performance.

### **Recent Accounting Guidance**

For information regarding recent accounting guidance and its impact on the Company's consolidated financial statements, see Note 2 to the consolidated financial statements in Part IV, Item 15 of this Annual Report on Form 10-K.

## ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

**Interest Income Rate Risk.** Changes in the overall level of interest rates affect the interest income that is generated from the Company's cash, cash equivalents and short-term investments. For the year ended December 31, 2017, total interest income was \$7.0 million. Cash and cash equivalents consist primarily of highly liquid investments such as money market funds and deposits held at major banks. Short-term investments consist primarily of deposits held by certain foreign subsidiaries of the Company with original maturities of three months to one year.

**Foreign Currency Transaction Risk.** As the Company operates in international regions, a portion of its revenue, expenses, cash, accounts receivable and payment obligations are denominated in foreign currencies. As a result, changes in currency exchange rates will affect the Company's financial position, results of operations and cash flows. The Company is most impacted by movements in and among the Euro, Japanese Yen, South Korean Won, British Pound, Taiwan Dollar, Indian Rupee and U.S. Dollar.

With respect to revenue, on average for the year ended December 31, 2017, the U.S. Dollar was 1.0% weaker, when measured against the Company's primary foreign currencies, than for the year ended December 31, 2016. The table below presents the impacts of currency fluctuations on revenue for the year ended December 31, 2017. Amounts in brackets indicate a net adverse impact from currency fluctuations.

<i>(in thousands)</i>	Year Ended December 31, 2017
Euro	\$ 6,634
South Korean Won	1,439
Taiwan Dollar	886
Indian Rupee	838
Japanese Yen	(3,416)
British Pound	(1,316)
Other	329
Total	<u>\$ 5,394</u>

The weaker U.S. Dollar also resulted in increased operating income of \$3.5 million for the year ended December 31, 2017 as compared to the year ended December 31, 2016.

The most significant currency impacts on revenue and operating income are typically attributable to U.S. Dollar exchange rate changes against the British Pound, Euro, Japanese Yen and South Korean Won as reflected in the charts below:

As of	Period End Exchange Rates			
	GBP/USD	EUR/USD	USD/JPY	USD/KRW
December 31, 2014	1.557	1.210	119.703	1,094.930
December 31, 2015	1.474	1.086	120.337	1,176.886
December 31, 2016	1.234	1.051	116.918	1,208.313
<b>December 31, 2017</b>	<b>1.351</b>	<b>1.200</b>	<b>112.701</b>	<b>1,068.376</b>

Year Ended	Average Exchange Rates			
	GBP/USD	EUR/USD	USD/JPY	USD/KRW
December 31, 2015	1.528	1.110	121.018	1,131.542
December 31, 2016	1.355	1.107	108.530	1,160.699
<b>December 31, 2017</b>	<b>1.289</b>	<b>1.130</b>	<b>112.139</b>	<b>1,130.945</b>

**ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA**

The following tables set forth selected unaudited quarterly information. The Company believes that the amounts stated below present fairly the results of such periods when read in conjunction with the consolidated financial statements and related notes included in Part IV, Item 15 of this Annual Report on Form 10-K.

Other information required by this Item is included in Part IV, Item 15 of this Annual Report on Form 10-K.

<i>(in thousands, except per share data)</i>	Fiscal Quarter Ended			
	December 31, 2017	September 30, 2017	June 30, 2017	March 31, 2017
Revenue	\$ 302,336	\$ 275,585	\$ 263,924	\$ 253,405
Gross profit	261,524	239,602	227,586	216,374
Operating income	100,679	106,183	98,394	85,472
Net income	52,585	73,630	69,730	63,306
Earnings per share – basic	\$ 0.62	\$ 0.87	\$ 0.82	\$ 0.74
Earnings per share – diluted	\$ 0.61	\$ 0.85	\$ 0.80	\$ 0.73

<i>(in thousands, except per share data)</i>	Fiscal Quarter Ended			
	December 31, 2016	September 30, 2016	June 30, 2016	March 31, 2016
Revenue	\$ 270,628	\$ 245,862	\$ 246,069	\$ 225,906
Gross profit	231,650	210,276	209,058	190,621
Operating income	96,966	100,099	94,155	85,022
Net income	69,983	69,557	69,628	56,468
Earnings per share – basic	\$ 0.81	\$ 0.80	\$ 0.79	\$ 0.64
Earnings per share – diluted	\$ 0.80	\$ 0.78	\$ 0.78	\$ 0.63



## ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

### ITEM 9A. CONTROLS AND PROCEDURES

**Evaluation of Disclosure Controls and Procedures.** As required by Rules 13a-15 and 15d-15 of the Securities Exchange Act of 1934, as amended, or the Exchange Act, the Company has evaluated, with the participation of management, including the Chief Executive Officer and the Chief Financial Officer, the effectiveness of the design and operation of its disclosure controls and procedures as of the end of the period covered by this report. Based on such evaluation, the Chief Executive Officer and Chief Financial Officer have concluded that such disclosure controls and procedures are effective, as defined in Rule 13a-15(e) of the Exchange Act.

The Company has a Disclosure Review Committee to assist in the quarterly evaluation of the Company's internal disclosure controls and procedures and in the review of the Company's periodic filings under the Exchange Act. The membership of the Disclosure Review Committee consists of the Company's President and Chief Executive Officer; Chief Financial Officer; Vice President of Finance; General Counsel; Senior Director, Global Investor Relations; Vice President of Worldwide Sales and Customer Excellence; Vice President of Human Resources; Vice President, Corporate Marketing and Business Development; Vice President and General Manager, Design and Platform Business Unit; and Vice President and General Manager of Electronics, Fluids and Mechanical. This committee is advised by external counsel, particularly on SEC-related matters. Additionally, other members of the Company's global management team advise the committee with respect to disclosure via a sub-certification process.

The Company believes, based on its knowledge, that the financial statements and other financial information included in this report fairly present, in all material respects, the financial condition, results of operations and cash flows of the Company as of and for the periods presented in this report. The Company is committed to both a sound internal control environment and to good corporate governance.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with policies or procedures may deteriorate.

From time to time, the Company reviews the disclosure controls and procedures, and may periodically make changes to enhance their effectiveness and to ensure that the Company's systems evolve with its business.

**Report on Internal Control over Financial Reporting.** The Company's management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rules 13a-15(f). Under the supervision and with the participation of the Company's management, including the Company's Chief Executive Officer and Chief Financial Officer, the Company has conducted an evaluation of the effectiveness of its internal control over financial reporting based upon the *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on this evaluation, the Company's Chief Executive Officer and Chief Financial Officer have concluded that the Company's internal control over financial reporting was effective at December 31, 2017.

Additionally, Deloitte & Touche LLP, an independent registered public accounting firm, has issued an attestation report on the Company's internal control over financial reporting. This report is included in Item 15 of this Annual Report on Form 10-K.

**Changes in Internal Controls.** There were no changes in the Company's internal controls over financial reporting that occurred during the three months ended December 31, 2017 that materially affected, or were reasonably likely to materially affect, the Company's internal control over financial reporting. During fiscal year 2017, the Company implemented internal controls to ensure it has adequately evaluated contracts and properly assessed the impact of the new accounting standard related to revenue recognition on the Company's financial statements to facilitate the adoption on January 1, 2018. The Company does not expect significant changes to its internal controls over financial reporting due to the adoption of the new standard.

### ITEM 9B. OTHER INFORMATION

None.

### **PART III**

#### **ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE**

The information required by this Item is incorporated by reference to the Company's 2018 Proxy Statement and is set forth under "Our Board of Directors", "Our Executive Officers" and "Ownership of Our Common Stock" therein.

#### **ITEM 11. EXECUTIVE COMPENSATION**

The information required by this Item is incorporated by reference to the Company's 2018 Proxy Statement and is set forth under "Our Board of Directors" and "Our Executive Officers" therein.

#### **ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT, AND RELATED STOCKHOLDER MATTERS**

The information required by this Item is incorporated by reference to the Company's 2018 Proxy Statement and is set forth under "Ownership of Our Common Stock" therein.

#### **ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE**

The information required by this Item is incorporated by reference to the Company's 2018 Proxy Statement and is set forth under "Our Board of Directors" therein.

#### **ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES**

The information required by this Item is incorporated by reference to the Company's 2018 Proxy Statement and is set forth under "Independent Registered Public Accounting Firm" therein.

## PART IV

### ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(a) *Documents Filed as Part of this Annual Report on Form 10-K:*

1. *Financial Statements:* The following consolidated financial statements and reports are filed as part of this report:

- Management's Report on Internal Control over Financial Reporting	55
- Reports of Independent Registered Public Accounting Firm	56
- Consolidated Balance Sheets as of December 31, 2017 and 2016	58
- Consolidated Statements of Income for the years ended December 31, 2017, 2016 and 2015	59
- Consolidated Statements of Comprehensive Income for the years ended December 31, 2017, 2016 and 2015	60
- Consolidated Statements of Cash Flows for the years ended December 31, 2017, 2016 and 2015	61
- Consolidated Statements of Stockholders' Equity for the years ended December 31, 2017, 2016 and 2015	62
- Notes to Consolidated Financial Statements	63

2. *Financial Statement Schedule:* The following financial statement schedule is filed as part of this report and should be read in conjunction with the consolidated financial statements.

- Schedule II - Valuation and Qualifying Accounts	84
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Schedules not listed above have been omitted because they are not applicable, are not required or the information required to be set forth therein is included in the consolidated financial statements or notes thereto.

3. *Exhibits:* The exhibits listed in the accompanying Exhibit Index immediately following the financial statement schedule are filed as part of, or incorporated by reference into, this Annual Report on Form 10-K.

(b) *Exhibits:*

The Company hereby files as part of this Annual Report on Form 10-K the exhibits listed in the Exhibit Index immediately following the financial statement schedule of this Annual Report on Form 10-K.

(c) *Financial Statement Schedule:*

The Company hereby files as part of this Annual Report on Form 10-K the financial statement schedule listed in Item 15(a)(2) as set forth above.

## MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

Management is responsible for establishing and maintaining an adequate system of internal control over financial reporting for the Company. In order to evaluate the effectiveness of internal control over financial reporting, management has conducted an assessment, including testing, using the financial reporting criteria in the *Internal Control - Integrated Framework (2013)*, issued by the Committee of Sponsoring Organizations of the Treadway Commission.

The Company's system of internal control over financial reporting is designed to provide reasonable assurance to the Company's management and Board of Directors regarding the reliability of financial records used in preparation of the Company's published financial statements. As all internal control systems have inherent limitations, even systems determined to be effective can provide only reasonable assurance with respect to financial statement preparation and presentation. Based on its assessment, management has concluded that the Company maintained an effective system of internal control over financial reporting as of December 31, 2017. Deloitte & Touche LLP, an independent registered public accounting firm, has audited the Company's internal control over financial reporting as of December 31, 2017, as stated in their report which appears in Part IV, Item 15 of this Annual Report on Form 10-K.

/s/ AJEI S. GOPAL

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**Ajei S. Gopal**

**President and Chief Executive Officer**

**February 22, 2018**

/s/ MARIA T. SHIELDS

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**Maria T. Shields**

**Chief Financial Officer**

**February 22, 2018**

## REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Stockholders of ANSYS, Inc.

### Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of ANSYS, Inc. and subsidiaries (the "Company") as of December 31, 2017 and 2016, the related consolidated statements of income, comprehensive income, stockholders' equity, and cash flows, for each of the three years in the period ended December 31, 2017, and the related notes and the schedule listed in the Index at Item 15 (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2017 and 2016, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2017, in conformity with accounting principles generally accepted in the United States of America.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2017, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated February 22, 2018, expressed an unqualified opinion on the Company's internal control over financial reporting.

### Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ Deloitte & Touche LLP  
Pittsburgh, Pennsylvania  
February 22, 2018

We have served as the Company's auditor since 2002.

## REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Stockholders of ANSYS, Inc.

### Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of ANSYS, Inc. and subsidiaries (the “Company”) as of December 31, 2017, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2017, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by COSO.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated financial statements as of and for the year ended December 31, 2017, of the Company and our report dated February 22, 2018, expressed an unqualified opinion on those financial statements.

### Basis for Opinion

The Company’s management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management’s Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company’s internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

### Definition and Limitations of Internal Control over Financial Reporting

A company’s internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company’s internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company’s assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Deloitte & Touche LLP  
Pittsburgh, Pennsylvania  
February 22, 2018

**ANSYS, INC. AND SUBSIDIARIES**  
**CONSOLIDATED BALANCE SHEETS**

<i>(in thousands, except share and per share data)</i>	December 31,	
	2017	2016
<b>ASSETS</b>		
Current assets:		
Cash and cash equivalents	\$ 881,501	\$ 822,479
Short-term investments	286	381
Accounts receivable, less allowance for doubtful accounts of \$6,800 and \$5,700, respectively	124,659	107,192
Other receivables and current assets	263,820	239,349
Total current assets	1,270,266	1,169,401
Property and equipment, net	57,096	54,677
Goodwill	1,378,553	1,337,215
Other intangible assets, net	157,625	172,619
Other long-term assets	35,972	24,287
Deferred income taxes	42,111	42,327
Total assets	\$ 2,941,623	\$ 2,800,526
<b>LIABILITIES AND STOCKHOLDERS' EQUITY</b>		
Current liabilities:		
Accounts payable	\$ 6,042	\$ 7,395
Accrued bonuses and commissions	69,925	49,487
Accrued income taxes	5,760	5,263
Other accrued expenses and liabilities	86,335	73,676
Deferred revenue	440,491	403,279
Total current liabilities	608,553	539,100
Long-term liabilities:		
Deferred income taxes	1,461	2,259
Other long-term liabilities	85,778	50,762
Total long-term liabilities	87,239	53,021
Commitments and contingencies		
Stockholders' equity:		
Preferred stock, \$.01 par value; 2,000,000 shares authorized; zero shares issued or outstanding	—	—
Common stock, \$.01 par value; 300,000,000 shares authorized; 93,236,023 shares issued	932	932
Additional paid-in capital	873,357	883,010
Retained earnings	2,316,916	2,057,665
Treasury stock, at cost: 9,044,498 and 7,548,188 shares, respectively	(907,530)	(675,550)
Accumulated other comprehensive loss	(37,844)	(57,652)
Total stockholders' equity	2,245,831	2,208,405
Total liabilities and stockholders' equity	\$ 2,941,623	\$ 2,800,526

The accompanying notes are an integral part of the consolidated financial statements.

**ANSYS, INC. AND SUBSIDIARIES**  
**CONSOLIDATED STATEMENTS OF INCOME**

<i>(in thousands, except per share data)</i>	Year Ended December 31,		
	2017	2016	2015
<b>Revenue:</b>			
Software licenses	\$ 624,964	\$ 568,174	\$ 555,105
Maintenance and service	470,286	420,291	387,648
Total revenue	<b>1,095,250</b>	988,465	942,753
<b>Cost of sales:</b>			
Software licenses	34,421	28,860	29,105
Amortization	36,794	38,092	38,755
Maintenance and service	78,949	79,908	79,386
Total cost of sales	<b>150,164</b>	146,860	147,246
Gross profit	<b>945,086</b>	841,605	795,507
<b>Operating expenses:</b>			
Selling, general and administrative	338,640	269,515	253,603
Research and development	202,746	183,093	168,831
Amortization	12,972	12,755	19,394
Total operating expenses	<b>554,358</b>	465,363	441,828
Operating income	<b>390,728</b>	376,242	353,679
Interest income	6,962	4,209	2,829
Other (expense) income, net	(1,996)	(136)	257
Income before income tax provision	<b>395,694</b>	380,315	356,765
Income tax provision	136,443	114,679	104,244
Net income	<b>\$ 259,251</b>	\$ 265,636	\$ 252,521
<b>Earnings per share – basic:</b>			
Earnings per share	<b>\$ 3.05</b>	\$ 3.05	\$ 2.82
Weighted average shares	<b>84,988</b>	87,227	89,561
<b>Earnings per share – diluted:</b>			
Earnings per share	<b>\$ 2.98</b>	\$ 2.99	\$ 2.76
Weighted average shares	<b>86,854</b>	88,969	91,502

The accompanying notes are an integral part of the consolidated financial statements.



**ANSYS, INC. AND SUBSIDIARIES**  
**CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME**

<i>(in thousands)</i>	Year Ended December 31,		
	2017	2016	2015
Net income	<b>\$ 259,251</b>	\$ 265,636	\$ 252,521
Other comprehensive income (loss):			
Foreign currency translation adjustments	19,808	(5,488)	(20,410)
Comprehensive income	<b>\$ 279,059</b>	\$ 260,148	\$ 232,111

The accompanying notes are an integral part of the consolidated financial statements.

**ANSYS, INC. AND SUBSIDIARIES**  
**CONSOLIDATED STATEMENTS OF CASH FLOWS**

<i>(in thousands)</i>	Year Ended December 31,		
	2017	2016	2015
<b>Cash flows from operating activities:</b>			
Net income	\$ 259,251	\$ 265,636	\$ 252,521
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	67,678	69,587	77,670
Deferred income tax benefit	(2,693)	(10,921)	(15,196)
Provision for bad debts	1,474	2,009	1,304
Stock-based compensation expense	53,154	33,347	33,951
Other	21	1,290	1,413
Changes in operating assets and liabilities:			
Accounts receivable	(14,406)	(17,388)	6,044
Other receivables and current assets	(18,498)	(39,644)	(17,662)
Other long-term assets	2,343	(7,167)	273
Accounts payable, accrued expenses and current liabilities	27,045	16,919	(6,993)
Accrued income taxes	1,215	9,052	5,770
Deferred revenue	20,648	41,430	40,566
Other long-term liabilities	33,206	1,830	(3,962)
Net cash provided by operating activities	<b>430,438</b>	<b>365,980</b>	<b>375,699</b>
<b>Cash flows from investing activities:</b>			
Acquisitions, net of cash acquired	(63,885)	(7,891)	(46,117)
Capital expenditures	(19,149)	(12,443)	(16,145)
Other investing activities	(14,409)	(11,839)	230
Net cash used in investing activities	<b>(97,443)</b>	<b>(32,173)</b>	<b>(62,032)</b>
<b>Cash flows from financing activities:</b>			
Purchase of treasury stock	(336,042)	(336,335)	(337,910)
Restricted stock withholding taxes paid in lieu of issued shares	(11,112)	(5,057)	(4,446)
Contingent consideration payments	—	(1,048)	(1,173)
Proceeds from shares issued for stock-based compensation	52,503	53,811	43,623
Other financing activities	—	(1)	(21)
Net cash used in financing activities	<b>(294,651)</b>	<b>(288,630)</b>	<b>(299,927)</b>
Effect of exchange rate fluctuations on cash and cash equivalents	20,678	(6,866)	(17,636)
Net increase (decrease) in cash and cash equivalents	<b>59,022</b>	<b>38,311</b>	<b>(3,896)</b>
Cash and cash equivalents, beginning of period	822,479	784,168	788,064
Cash and cash equivalents, end of period	<b>\$ 881,501</b>	<b>\$ 822,479</b>	<b>\$ 784,168</b>
<b>Supplemental disclosures of cash flow information:</b>			
Income taxes paid	\$ 116,389	\$ 118,455	\$ 107,218
Interest paid	\$ 199	\$ 822	\$ 620
Fair value of stock options and restricted stock awards assumed in connection with acquisitions	\$ —	\$ —	\$ 3,528

The accompanying notes are an integral part of the consolidated financial statements.

**ANSYS, INC. AND SUBSIDIARIES**  
**CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY**

<i>(in thousands)</i>	Common Stock		Additional Paid-In Capital	Retained Earnings	Treasury Stock		Accumulated Other Comprehensive (Loss)/Income	Total Stockholders' Equity
	Shares	Amount			Shares	Amount		
Balance, January 1, 2015	93,236	\$ 932	\$ 904,825	\$ 1,539,508	2,471	\$ (196,010)	\$ (31,754)	\$ 2,217,501
Treasury shares acquired					3,833	(337,910)		(337,910)
Stock-based compensation activity, including tax benefit of \$6,068			(8,434)		(1,139)	87,631		79,197
Other comprehensive loss							(20,410)	(20,410)
Net income for the year				252,521				252,521
Acquisition-related activity			(1,922)		(68)	5,450		3,528
Balance, December 31, 2015	93,236	932	894,469	1,792,029	5,097	(440,839)	(52,164)	2,194,427
Treasury shares acquired					3,700	(336,335)		(336,335)
Stock-based compensation activity, including tax benefit of \$8,065			(11,459)		(1,249)	101,624		90,165
Other comprehensive loss							(5,488)	(5,488)
Net income for the year				265,636				265,636
<b>Balance, December 31, 2016</b>	<b>93,236</b>	<b>932</b>	<b>883,010</b>	<b>2,057,665</b>	<b>7,548</b>	<b>(675,550)</b>	<b>(57,652)</b>	<b>2,208,405</b>
<b>Treasury shares acquired</b>					<b>2,750</b>	<b>(336,042)</b>		<b>(336,042)</b>
<b>Stock-based compensation activity</b>			<b>(9,653)</b>		<b>(1,254)</b>	<b>104,062</b>		<b>94,409</b>
<b>Other comprehensive income</b>							<b>19,808</b>	<b>19,808</b>
<b>Net income for the year</b>				<b>259,251</b>				<b>259,251</b>
<b>Balance, December 31, 2017</b>	<b>93,236</b>	<b>\$ 932</b>	<b>\$ 873,357</b>	<b>\$ 2,316,916</b>	<b>9,044</b>	<b>\$ (907,530)</b>	<b>\$ (37,844)</b>	<b>\$ 2,245,831</b>

The accompanying notes are an integral part of the consolidated financial statements.

**ANSYS, INC. AND SUBSIDIARIES**  
**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS**  
**December 31, 2017**

**1. Organization**

ANSYS, Inc. (hereafter the Company or ANSYS) develops and globally markets engineering simulation software and services widely used by engineers, designers, researchers and students across a broad spectrum of industries and academia, including aerospace and defense, automotive, electronics, semiconductors, energy, materials and chemical processing, turbomachinery, consumer products, healthcare, and sports.

As defined by the accounting guidance for segment reporting, the Company operates as one segment.

Given the integrated approach to the multi-discipline problem-solving needs of the Company's customers, a single sale of software may contain components from multiple product areas and include combined technologies. The Company also has a multi-year product and integration strategy that will result in new, combined products or changes to the historical product offerings. As a result, it is impracticable for the Company to provide accurate historical or current reporting among its various product lines.

**2. Accounting Policies**

**Accounting Principles**

The financial statements and accompanying notes are prepared in accordance with accounting principles generally accepted in the United States.

**Principles of Consolidation**

The accompanying consolidated financial statements include the accounts of the Company and its wholly owned subsidiaries. All intercompany accounts and transactions have been eliminated.

**Use of Estimates**

The preparation of financial statements in conformity with accounting principles generally accepted in the United States requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements. Estimates also affect the amounts of revenue and expenses during the reported periods. Significant estimates included in these consolidated financial statements include:

- Allowances for doubtful accounts receivable
- Income tax accruals, including those related to the Tax Cuts and Jobs Act
- Uncertain tax positions
- Tax valuation reserves
- Fair value of stock-based compensation and probabilities of performance award attainment
- Contract revenue
- Acquired deferred revenue
- Useful lives for depreciation and amortization
- Valuations of goodwill and other intangible assets
- Deferred compensation
- Loss contingencies

Actual results could differ from these estimates. Changes in estimates are recorded in the results of operations in the period that the changes occur.

## Revenue Recognition

Revenue is derived principally from the licensing of computer software products and from related maintenance contracts. Revenue from perpetual licenses is classified as license revenue and is recognized upon delivery of the licensed product and the utility that enables the customer to access authorization keys, provided that acceptance has occurred and a signed contractual obligation has been received, the price is fixed and determinable, and collectibility of the receivable is probable. The Company determines the fair value of PCS sold together with perpetual licenses based on the rate charged for PCS when sold separately. Revenue from PCS contracts is classified as maintenance and service revenue and is recognized ratably over the term of the contract.

Revenue for software lease licenses is classified as license revenue and is recognized over the period of the lease contract. Typically, the Company's software leases include PCS which, due to the short term (principally one year or less) of the Company's software lease licenses, cannot be separated from lease revenue for accounting purposes. As a result, both the lease licenses and PCS are recognized ratably over the lease period. The Company includes the revenue for the entire lease arrangement within software license revenue in the consolidated statements of income.

Many of the Company's semiconductor products are typically licensed via longer term leases of 24–36 months. The Company recognizes revenue for these licenses over the term of the lease contract. Because the Company does not have vendor-specific objective evidence of the fair value of these leases, the Company also recognizes revenue from perpetual licenses over the term of the lease contract during the infrequent occurrence of these licenses being sold with semiconductor leases in multiple-element arrangements.

Revenue from training, support and other services is recognized as the services are performed. The Company applies the specific performance method to contracts in which the service consists of a single act, such as providing a training class to a customer, and the proportional performance method to other service contracts that are longer in duration and often include multiple acts (for example, both training and consulting). In applying the proportional performance method, the Company typically utilizes output-based estimates for services with contractual billing arrangements that are not based on time and materials, and estimates output based on the total tasks completed as compared to the total tasks required for each work contract. Input-based estimates are utilized for services that involve general consultations with contractual billing arrangements based on time and materials, utilizing direct labor as the input measure.

The Company also executes arrangements through independent channel partners in which the channel partners are authorized to market and distribute the Company's software products to end users of the Company's products and services in specified territories. In sales facilitated by channel partners, the channel partner bears the risk of collection from the end-user customer. The Company recognizes revenue from transactions with channel partners when the channel partner submits a written purchase commitment, collectibility from the channel partner is probable, a license agreement signed by the end-user customer is received and delivery has occurred, provided that all other revenue recognition criteria are satisfied. Revenue from channel partner transactions is the amount remitted to the Company by the channel partners. This amount includes a fee for PCS that is compensation for providing technical enhancements and the second level of technical support to the end user, which is based on the rate charged for PCS when sold separately, and is recognized over the period that PCS is to be provided. The Company does not offer right of return, product rotation or price protection to any of its channel partners.

Non-income related taxes collected from customers and remitted to governmental authorities are recorded on the consolidated balance sheet as accounts receivable and accrued expenses. The collection and payment of these amounts are reported on a net basis in the consolidated statements of income and do not impact reported revenues or expenses.

The Company warrants to its customers that its software will substantially perform as specified in the Company's most current user manuals. The Company has not experienced significant claims related to software warranties beyond the scope of maintenance support, which the Company is already obligated to provide. Consequently, the Company has not established reserves for warranty obligations.

## Cash and Cash Equivalents

Cash and cash equivalents consist primarily of highly liquid investments such as deposits held at major banks and money market funds. Cash equivalents are carried at cost, which approximates fair value. The Company's cash and cash equivalents balances comprise the following:

<i>(in thousands, except percentages)</i>	December 31, 2017		December 31, 2016	
	Amount	% of Total	Amount	% of Total
Cash accounts	\$ 568,587	64.5	\$ 488,504	59.4
Money market funds	312,914	35.5	333,975	40.6
Total	<u>\$ 881,501</u>		<u>\$ 822,479</u>	

The Company's money market fund balances are held in various funds of a single issuer.

## Property and Equipment

Property and equipment is stated at cost. Depreciation is computed using the straight-line method over the estimated useful lives of the various classes of assets, which range from one to forty years. Repairs and maintenance are charged to expense as incurred. Gains or losses from the sale or retirement of property and equipment are included in operating income.

## Research and Development

Research and development costs, other than certain capitalized software development costs, are expensed as incurred.

## Software Development Costs

Internally developed software costs required to be capitalized as defined by the accounting guidance are not material to the Company's consolidated financial statements.

## Business Combinations

When the Company consummates an acquisition, the assets acquired and the liabilities assumed are recognized separately from goodwill at their acquisition date fair values. Goodwill as of the acquisition date is measured as the excess of the fair value of consideration transferred over the net of the acquisition date fair values of the assets acquired and the liabilities assumed. While best estimates and assumptions are used to accurately value assets acquired and liabilities assumed at the acquisition date as well as contingent consideration, where applicable, the Company's estimates are inherently uncertain and subject to refinement. As a result, during the measurement period, which may be up to one year from the acquisition date, the Company records adjustments to the assets acquired and liabilities assumed with the corresponding offset to goodwill as the Company obtains new information about facts and circumstances that existed as of the acquisition date that, if known, would have affected the measurement of the amounts recognized as of that date. Upon the earlier of the conclusion of the measurement period or final determination of the values of assets acquired or liabilities assumed, any subsequent adjustments are recorded in the consolidated statements of income.

## Goodwill and Other Intangible Assets

Goodwill represents the excess of the consideration transferred over the fair value of net identifiable assets acquired. Other intangible assets consist of trade names, customer lists, contract backlog and acquired software and technology. Intangible assets that are not considered to have an indefinite useful life are amortized over their useful lives, which are generally two to fifteen years. Amortization expense for intangible assets was \$49.8 million, \$50.8 million and \$58.1 million for the years ended December 31, 2017, 2016 and 2015, respectively.

The Company tests goodwill and indefinite-lived intangible assets for impairment at least annually by performing a quantitative assessment of whether the fair value of each reporting unit or asset exceeds its carrying amount. Goodwill is tested at the reporting unit level and indefinite-lived intangible assets are tested at the individual asset level. This requires the Company to assess and make judgments regarding a variety of factors which impact the fair value of the reporting unit or asset being tested, including business plans, anticipated future cash flows, economic projections and other market data.

The Company performs its annual impairment tests for goodwill and indefinite-lived intangible assets as of January 1 of each year unless there is an indicator that would require a test during the year. The Company periodically reviews the carrying value

of other intangible assets and will recognize impairments when events or circumstances indicate that such assets may be impaired.

### Concentrations of Credit Risk

The Company has a concentration of credit risk with respect to revenue and trade receivables due to the use of certain significant channel partners to market and sell the Company's products. The Company performs periodic credit evaluations of its customers' financial condition and generally does not require collateral. The following table outlines concentrations of risk with respect to the Company's revenue:

<i>(as a % of revenue)</i>	Year Ended December 31,		
	2017	2016	2015
Revenue from channel partners	25%	24%	24%
Largest channel partner	5%	5%	5%
2 <sup>nd</sup> largest channel partner	2%	2%	2%

No single customer accounted for more than 5% of the Company's revenue in 2017, 2016 or 2015.

In addition to the concentration of credit risk with respect to trade receivables, the Company's cash and cash equivalents are also exposed to concentration of credit risk. The Company's cash and cash equivalent accounts are insured through various public and private bank deposit insurance programs, foreign and domestic; however, a significant portion of the Company's funds are not insured. The following table outlines concentrations of risk with respect to the Company's cash and cash equivalents:

<i>(in thousands)</i>	As of December 31,	
	2017	2016
Cash and cash equivalents held domestically	\$ 561,417	\$ 593,348
Cash and cash equivalents held by foreign subsidiaries	320,084	229,131
Cash and cash equivalents held in excess of deposit insurance, foreign and domestic	852,138	805,374
Largest balance of cash and cash equivalents held with one financial institution, foreign and domestic	328,902	377,602

### Allowance for Doubtful Accounts

The Company makes judgments as to its ability to collect outstanding receivables and provides allowances for a portion of receivables when collection becomes doubtful. Provisions are made based upon a specific review of all significant outstanding invoices from both value and delinquency perspectives. For those invoices not specifically reviewed, provisions are estimated at differing rates based upon the age of the receivable and the geographic area of origin. In determining these percentages, the Company considers its historical collection experience and current economic trends in the customer's industry and geographic region. The Company recorded provisions for doubtful accounts of \$1.5 million, \$2.0 million and \$1.3 million for the years ended December 31, 2017, 2016 and 2015, respectively.

### Income Taxes

The Company accounts for income taxes under the asset and liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements. Under this method, deferred tax assets and liabilities are determined based on the differences between the financial statement and tax bases of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. The effect of a change in tax rates on deferred tax assets and liabilities is recognized in income in the period of the enactment date.

The Company records net deferred tax assets to the extent it believes these assets will more likely than not be realized. In making such determination, the Company considers all available positive and negative evidence, including scheduled reversals of deferred tax liabilities, projected future taxable income, tax planning strategies and recent financial operations. In the event the Company determines that it will be able to realize deferred tax assets for which a valuation allowance was used to reduce their carrying value, the adjustment to the valuation allowance will be recorded as a reduction to the provision for income taxes.

Tax benefits related to uncertain tax positions taken or expected to be taken on a tax return are recorded when such benefits meet a more-likely-than-not threshold. Otherwise, these tax benefits are recorded when a tax position has been effectively

settled, which means that the statute of limitations has expired or the appropriate taxing authority has completed its examination even though the statute of limitations remains open. The Company recognizes interest and penalties related to income taxes within the income tax expense line in the consolidated statements of income. Accrued interest and penalties are included within the related tax liability line in the consolidated balance sheets.

### Foreign Currencies

Certain of the Company's sales and intercompany transactions are denominated in foreign currencies. These transactions are translated to the functional currency at the exchange rate on the transaction date. Assets and liabilities denominated in a currency other than the Company's or subsidiary's functional currency are translated at the effective exchange rate on the balance sheet date. Gains and losses resulting from foreign exchange transactions are included in other (expense) income, net. The Company recorded net foreign exchange losses of \$1.9 million for the year ended December 31, 2017, and net foreign exchange gains of \$0.1 million and \$0.5 million for the years ended December 31, 2016 and 2015, respectively.

The financial statements of the Company's foreign subsidiaries are translated from the functional (local) currency to U.S. Dollars. Assets and liabilities are translated at the exchange rates on the balance sheet date. Results of operations are translated at average exchange rates, which approximate rates in effect when the underlying transactions occurred.

### Accumulated Other Comprehensive Loss

Accumulated other comprehensive loss is composed entirely of foreign currency translation adjustments.

### Earnings Per Share

Basic earnings per share (EPS) amounts are computed by dividing earnings by the weighted average number of common shares outstanding during the period. Diluted EPS amounts assume the issuance of common stock for all potentially dilutive equivalents outstanding. To the extent stock awards are anti-dilutive, they are excluded from the calculation of diluted EPS.

The details of basic and diluted EPS are as follows:

<i>(in thousands, except per share data)</i>	Year Ended December 31,		
	2017	2016	2015
Net income	\$ 259,251	\$ 265,636	\$ 252,521
Weighted average shares outstanding – basic	84,988	87,227	89,561
Dilutive effect of stock plans	1,866	1,742	1,941
Weighted average shares outstanding – diluted	86,854	88,969	91,502
Basic earnings per share	\$ 3.05	\$ 3.05	\$ 2.82
Diluted earnings per share	\$ 2.98	\$ 2.99	\$ 2.76
Anti-dilutive shares	84	260	206

### Stock-Based Compensation

The Company accounts for stock-based compensation in accordance with share-based payment accounting guidance. The guidance requires an entity to measure the cost of employee services received in exchange for an award of equity instruments based on the grant-date fair value of the award. The cost is recognized over the period during which an employee is required to provide service in exchange for the award, typically the vesting period.

### Fair Value of Financial Instruments

The Company accounts for certain assets and liabilities at fair value in accordance with the accounting guidance applicable to fair value measurements and disclosures. The carrying values of cash, cash equivalents, short-term investments, accounts receivable, accounts payable, accrued expenses, other accrued liabilities and short-term obligations are deemed to be reasonable estimates of their fair values because of their short-term nature.

### New Accounting Guidance

**Revenue from contracts with customers:** In May 2014, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update No. 2014-09, *Revenue from Contracts with Customers (Topic 606)* (ASU 2014-09). ASU 2014-09 supersedes most current revenue recognition guidance, including industry-specific guidance. Previous guidance requires an entity to recognize revenue when persuasive evidence of an arrangement exists, delivery has occurred or services have been rendered,



the seller's price to the buyer is fixed or determinable, and collectibility is reasonably assured. Under the new guidance, an entity is required to evaluate revenue recognition by identifying a contract with a customer, identifying the performance obligations in the contract, determining the transaction price, allocating the transaction price to the performance obligations in the contract and recognizing revenue when (or as) the entity satisfies a performance obligation. The standard also requires disclosure of the nature, amount, timing and uncertainty of revenue and cash flows arising from contracts with customers.

ASU 2015-14, *Revenue from Contracts with Customers (Topic 606): Deferral of the Effective Date*, delayed the effective date of ASU 2014-09 to annual periods beginning after December 15, 2017, including interim periods within that reporting period. This standard is effective for the Company on January 1, 2018. Entities have the option of using a full retrospective, cumulative effect or modified retrospective approach to adopt ASU 2014-09. The Company will utilize the modified retrospective implementation approach. The Company expects a cumulative-effect adjustment to increase retained earnings by \$230.0 million - \$260.0 million, or \$165.0 million - \$190.0 million net of income tax, on January 1, 2018, primarily derived from revenue related to software lease licenses.

This update will impact the timing and amounts of revenue recognized, which will result in increased volatility in the amount of revenue recognized each period. The Company expects that the adoption of this standard will have a material impact on the Company's consolidated financial statements. While the Company expects that the standard will impact various elements of its business, the most significant impact is expected to be on the recognition of revenue related to software lease licenses. These licenses include the right to use the software and PCS over the term of the license. These licenses are currently recognized as lease license revenue ratably over the term of the license. Under the new standard and the existing interpretations, the Company expects to recognize approximately 50% of the revenue related to these licenses up-front at the time the license is delivered. The up-front portion will continue to be reported within lease license revenue, but the ratable portion allocation to PCS will be reflected in maintenance revenue, resulting in a significant shift from software license revenue to maintenance and services revenue as reported on the consolidated statement of income. In addition, it is anticipated that there will be an acceleration of income tax payments associated with deferred revenue and backlog credited to retained earnings and never recognized as revenue in the financial statements. The 2018 acceleration of cash payments is expected to be between \$15.0 million - \$20.0 million. The Company has also made a preliminary assessment that the expense related to sales commissions will not be materially different under the new standard. However, the Company's preliminary assessments could change as additional interpretations relating to the new standard are provided and as issues identified by software industry groups are addressed.

**Leases:** In February 2016, the FASB issued Accounting Standards Update No. 2016-02, *Leases (Topic 842)* (ASU 2016-02). ASU 2016-02 requires virtually all leases, other than leases that meet the definition of a short-term lease or leases of intangible assets, to be recorded on the balance sheet with a right-of-use asset and corresponding lease liability. Leases will be classified as either operating or finance leases based on certain criteria. This classification will determine the timing and presentation of expenses on the income statement, as well as the presentation of related cash flows. The standard is effective for annual periods beginning after December 15, 2018, including interim periods within that reporting period. Early adoption is permitted and a modified retrospective transition is required upon adoption. The Company does not expect to early adopt and continues to evaluate the effect that this update will have on its financial results upon adoption. The Company's preliminary assessment is that this update may materially increase the Company's assets and liabilities upon adoption. The Company has completed the initial inventory of its leases and policy elections, and the Company is currently developing new processes and controls to meet the accounting and disclosure requirements under the new standard.

**Employee share-based payment accounting:** In March 2016, the FASB issued Accounting Standards Update No. 2016-09, *Compensation - Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting* (ASU 2016-09). This update includes various areas for simplification related to aspects of the accounting for share-based payment transactions. One simplification is that the tax effects of share-based payment settlements will be recorded in the income statement. Prior guidance required tax windfalls at settlement, and tax shortfalls to the extent of previous windfalls, to be recorded in equity. This provision was required to be adopted prospectively.

The Company adopted the guidance during the quarter ended March 31, 2017. The primary impact of adoption was the recognition of excess tax benefits in the Company's provision for income taxes rather than paid-in capital, which resulted in the recognition of excess tax benefits in the provision for income taxes of \$13.3 million during the year ended December 31, 2017. In addition, the Company applied the change in classification of such benefits from financing to operating on the consolidated statements of cash flows on a retrospective basis, resulting in an increase to both net cash provided by operating activities and net cash used in financing activities of \$9.2 million and \$8.2 million for the years ended December 31, 2016 and 2015, respectively.

**Credit losses:** In June 2016, the FASB issued Accounting Standards Update No. 2016-13, *Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments* (ASU 2016-13). Previous guidance requires the allowance for doubtful accounts to be estimated based on an incurred loss model, which considers past and current conditions.

ASU 2016-13 requires companies to use an expected loss model that also considers reasonable and supportable forecasts of future conditions. ASU 2016-13 is effective for annual periods beginning after December 15, 2019, including interim periods within that reporting period. Early adoption is permitted for annual periods beginning after December 15, 2018, including interim periods within that reporting period. The standard requires a cumulative-effect adjustment to the statement of financial position as of the beginning of the first reporting period in which the guidance is effective. The Company is currently evaluating the effect that this update will have on its financial results upon adoption.

**Income taxes:** In October 2016, the FASB issued Accounting Standards Update No. 2016-16, *Income Taxes (Topic 740): Intra-Entity Transfers of Assets Other Than Inventory* (ASU 2016-16). Previous guidance requires the tax effects from intra-entity asset transfers to be deferred until the asset is sold to a third party or recovered through use. ASU 2016-16 eliminates this deferral for all intra-entity asset transfers other than inventory. The standard is effective for annual periods beginning after December 15, 2017, including interim periods within that reporting period. Early adoption is permitted and a modified retrospective transition is required upon adoption. The Company plans to adopt ASU 2016-16 effective January 1, 2018 and expects adoption to have an immaterial effect, if any, on its financial results.

**Business combinations:** In January 2017, the FASB issued Accounting Standards Update No. 2017-01, *Business Combinations (Topic 805): Clarifying the Definition of a Business* (ASU 2017-01). This update narrows the definition of a business. If substantially all the fair value of the gross assets acquired is concentrated in a single identifiable asset or group of similar identifiable assets, the acquiree is not a business. The update also requires a business to include an input and a substantive process that significantly contributes to the ability to create outputs. This definition is expected to reduce the number of acquisitions accounted for as business combinations, which will impact the accounting treatment of certain items, including the accounting treatment of contingent consideration and transaction expenses. ASU 2017-01 is effective for annual periods beginning after December 15, 2017, including interim periods within that reporting period. Early adoption is permitted and the update will be applied prospectively. The effect of the implementation will depend upon the nature of the Company's future acquisitions, if any. Historically, the Company has entered into acquisitions that would meet the definition of a business under ASU 2017-01. The Company plans to adopt ASU 2017-01 effective January 1, 2018.

### 3. Acquisitions

During the years ended December 31, 2017, 2016 and 2015 the Company completed various acquisitions to expand its customer base and accelerate the development of new and innovative products to the marketplace while lowering design and engineering costs for customers. The acquisitions were not individually significant. The combined purchase prices of the acquisitions purchased during the years ended December 31, 2017, 2016 and 2015 were approximately \$67.0 million, \$10.3 million and \$49.7 million, respectively. The 2017 technology acquisitions are further described in the table below:

Date of Closing	Company	Details
November 15, 2017	3DSIM	3DSIM, a developer of premier additive manufacturing technology, gives ANSYS a complete additive manufacturing simulation workflow solution. 3DSIM's software solutions empower manufacturers, designers, materials scientists and engineers to achieve their objectives through simulation-driven innovation rather than physical trial and error.
July 5, 2017	Computational Engineering International, Inc. (CEI Inc.)	CEI Inc., the developer of EnSight, aids engineers and scientists in their ability to analyze, visualize and communicate large simulation data sets in clear, higher-resolution outputs.
March 10, 2017	CLK Design Automation (CLK-DA)	CLK-DA offers fast transistor simulation technology that complements the Company's semiconductor product portfolio.

The operating results of each acquisition have been included in the Company's consolidated financial statements since each respective date of acquisition. The effects of the business combinations were not material to the Company's consolidated results of operations individually or in the aggregate.

In valuing deferred revenue on the balance sheets of the Company's acquisitions as of their respective acquisition dates, the Company applied the fair value provisions applicable to the accounting for business combinations, resulting in a reduction of deferred revenue as compared to the historical carrying amounts. As a result, the Company's post-acquisition revenue will be less than the sum of what would have otherwise been reported by ANSYS and each acquiree absent the acquisitions. The impacts on reported revenue for the years ended December 31, 2017, 2016 and 2015 were \$2.9 million, \$0.1 million and \$0.8 million, respectively.

#### 4. Other Receivables and Current Assets

The Company's other receivables and current assets comprise the following balances:

<i>(in thousands)</i>	December 31,	
	2017	2016
Receivables related to unrecognized revenue	\$ 215,155	\$ 199,119
Income taxes receivable, including overpayments and refunds	21,663	15,718
Prepaid expenses and other current assets	27,002	24,512
Total other receivables and current assets	<u>\$ 263,820</u>	<u>\$ 239,349</u>

Receivables for unrecognized revenue represent the current portion of billings made for annual lease licenses and software maintenance that have not yet been recognized as revenue.

#### 5. Property and Equipment

Property and equipment consists of the following:

<i>(in thousands)</i>	Estimated Useful Lives	December 31,	
		2017	2016
Equipment	1-10 years	\$ 88,189	\$ 78,614
Computer software	1-5 years	34,994	30,867
Buildings and improvements	5-40 years	26,423	25,472
Leasehold improvements	1-16 years	13,316	11,571
Furniture	1-13 years	9,239	8,618
Land		1,759	1,759
Property and equipment, gross		173,920	156,901
Less: Accumulated depreciation		(116,824)	(102,224)
Property and equipment, net		<u>\$ 57,096</u>	<u>\$ 54,677</u>

Depreciation expense related to property and equipment was \$17.9 million, \$18.7 million and \$19.5 million for the years ended December 31, 2017, 2016 and 2015, respectively.

#### 6. Goodwill and Intangible Assets

Goodwill represents the excess of the fair value of the consideration transferred over the value of net tangible and identifiable intangible assets of acquired businesses. Identifiable intangible assets acquired in business combinations are recorded based on their fair values on the date of acquisition.

During the first quarter of 2017, the Company completed the annual impairment test for goodwill and the indefinite-lived intangible asset and determined that these assets had not been impaired as of the test date, January 1, 2017. No other events or circumstances changed during the year ended December 31, 2017 that would indicate that the fair values of the Company's reporting unit and indefinite-lived intangible asset are below their carrying values.

The Company's intangible assets and estimated useful lives are classified as follows:

<i>(in thousands)</i>	December 31, 2017		December 31, 2016	
	Gross Carrying Amount	Accumulated Amortization	Gross Carrying Amount	Accumulated Amortization
Finite-lived intangible assets:				
Developed software and core technologies (3 – 11 years)	\$ 365,317	\$ (297,645)	\$ 338,594	\$ (275,130)
Customer lists and contract backlog (5 – 15 years)	171,048	(104,522)	159,549	(88,414)
Trade names (2 – 10 years)	127,200	(104,130)	127,952	(90,289)
Total	<u>\$ 663,565</u>	<u>\$ (506,297)</u>	<u>\$ 626,095</u>	<u>\$ (453,833)</u>
Indefinite-lived intangible assets:				
Trade name	<u>\$ 357</u>		<u>\$ 357</u>	

Amortization expense for the intangible assets reflected above was \$49.8 million, \$50.8 million and \$58.1 million for the years ended December 31, 2017, 2016 and 2015, respectively.

As of December 31, 2017, estimated future amortization expense for the intangible assets reflected above is as follows:

<i>(in thousands)</i>	
2018	\$ 39,162
2019	26,362
2020	25,449
2021	21,225
2022	16,197
Thereafter	28,873
Total intangible assets subject to amortization, net	<u>157,268</u>
Indefinite-lived trade name	357
Other intangible assets, net	<u>\$ 157,625</u>

The changes in goodwill during the years ended December 31, 2017 and 2016 are as follows:

<i>(in thousands)</i>	2017	2016
Beginning balance - January 1	\$ 1,337,215	\$ 1,332,348
Acquisitions	36,554	6,184
Adjustments <sup>(1)</sup>	(111)	(1)
Currency translation	4,895	(1,316)
Ending balance - December 31	<u>\$ 1,378,553</u>	<u>\$ 1,337,215</u>

<sup>(1)</sup> In accordance with the accounting for business combinations, the Company recorded adjustments to goodwill for the effect of changes in the provisional fair values of the assets acquired and liabilities assumed during the measurement period (up to one year from the acquisition date) as the Company obtained new information about facts and circumstances that existed as of the acquisition date that, if known, would have affected the measurement of the amounts recognized as of that date.

## 7. Fair Value Measurement

The valuation hierarchy for disclosure of assets and liabilities reported at fair value prioritizes the inputs for such valuations into three broad levels:

- Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities;
- Level 2: quoted prices for similar assets and liabilities in active markets or inputs that are observable for the asset or liability, either directly or indirectly through market corroboration, for substantially the full term of the financial instrument; or
- Level 3: unobservable inputs based on the Company's own assumptions used to measure assets and liabilities at fair value.

A financial asset's or liability's classification within the hierarchy is determined based on the lowest level input that is significant to the fair value measurement.

The following tables provide the assets carried at fair value and measured on a recurring basis:

<i>(in thousands)</i>	Fair Value Measurements at Reporting Date Using:			
	December 31, 2017	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
<b>Assets</b>				
Cash equivalents	\$ 312,914	\$ 312,914	\$ —	\$ —
Short-term investments	\$ 286	\$ —	\$ 286	\$ —
Deferred compensation plan investments	\$ 3,742	\$ 3,742	\$ —	\$ —

<i>(in thousands)</i>	Fair Value Measurements at Reporting Date Using:			
	December 31, 2016	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
<b>Assets</b>				
Cash equivalents	\$ 333,975	\$ 333,975	\$ —	\$ —
Short-term investments	\$ 381	\$ —	\$ 381	\$ —
Deferred compensation plan investments	\$ 459	\$ 459	\$ —	\$ —

The cash equivalents in the preceding tables represent money market funds.

The short-term investments in the preceding tables represent deposits held by certain foreign subsidiaries of the Company. The deposits have fixed interest rates with original maturities ranging from three months to one year.

The deferred compensation plan investments in the preceding tables represent trading securities held in a rabbi trust for the benefit of the non-affiliate Independent Directors. These securities consist of mutual funds traded in an active market with quoted prices. As a result, the plan assets were classified as Level 1 in the fair value hierarchy. The plan assets are recorded within other long-term assets on the Company's consolidated balance sheet.

The carrying values of cash, accounts receivable, accounts payable, accrued expenses, other accrued liabilities and short-term obligations approximate their fair values because of their short-term nature.

## 8. Income Taxes

Income before income taxes includes the following components:

<i>(in thousands)</i>	Year Ended December 31,		
	2017	2016	2015
Domestic	\$ 344,447	\$ 340,251	\$ 325,097
Foreign	51,247	40,064	31,668
Total	\$ 395,694	\$ 380,315	\$ 356,765

The provision for income taxes is composed of the following:

<i>(in thousands)</i>	Year Ended December 31,		
	2017	2016	2015
Current:			
Federal	\$ 112,414	\$ 99,783	\$ 93,853
State	7,879	8,338	7,733
Foreign	18,843	17,479	17,854
Deferred:			
Federal	(7,387)	(13,368)	(14,472)
State	(584)	(1,036)	(1,987)
Foreign	5,278	3,483	1,263
Total	\$ 136,443	\$ 114,679	\$ 104,244

The reconciliation of the U.S. federal statutory tax rate to the consolidated effective tax rate is as follows:

	Year Ended December 31,		
	2017	2016	2015
Federal statutory tax rate	35.0%	35.0%	35.0%
U.S. tax reform	4.5	—	—
State income taxes, net of federal benefit	1.1	1.6	1.1
Uncertain tax positions	0.3	(0.2)	(0.4)
Benefit from restructuring activities	—	(2.2)	(2.7)
Research and development credits	(1.4)	(1.0)	(1.1)
Domestic production activity benefit	(2.6)	(3.7)	(3.1)
Stock-based compensation	(3.1)	0.2	—
Other	0.7	0.5	0.4
	34.5%	30.2%	29.2%

On December 22, 2017, the U.S. government enacted comprehensive tax legislation commonly referred to as the Tax Cuts and Jobs Act (Tax Reform). Tax Reform makes broad and complex changes to the U.S. tax code, including, but not limited to, (1) reducing the U.S. federal corporate tax rate from 35 percent to 21 percent; (2) requiring companies to pay a one-time transition tax on certain unrepatriated earnings of foreign subsidiaries (Transition Tax); (3) generally eliminating U.S. federal income taxes on dividends from foreign subsidiaries; (4) creating a new provision designed to tax global intangible low-taxed income (GILTI) which allows for the possibility of using foreign tax credits (FTCs) and a deduction of up to 50 percent to offset the income tax liability (subject to some limitations); (5) repealing the domestic production activity deduction; (6) creating the base erosion anti-abuse tax, a new minimum tax; (7) allowing for full expensing of qualified property through bonus depreciation; and (8) creating limitations on the deductibility of certain executive compensation.

The SEC staff issued Staff Accounting Bulletin (SAB) 118, which provides guidance on accounting for the tax effects of Tax Reform. SAB 118 provides a measurement period that should not extend beyond one year from enactment for companies to complete the accounting under ASC 740, *Income Taxes*. In accordance with SAB 118, a company must reflect the income tax effects of those aspects of Tax Reform for which the accounting under ASC 740 is complete in the financial statements. To the extent that a company's accounting for certain income tax effects of Tax Reform is incomplete, but a reasonable estimate is able to be made, the company must record a provisional estimate in the financial statements. If a company cannot determine a provisional estimate to be included in the financial statements, it should continue to apply ASC 740 on the basis of the tax laws that were in effect immediately before the enactment of Tax Reform.

In connection with the Company's initial analysis of the impact of Tax Reform, a discrete net tax expense of \$17.9 million was recorded in the period ending December 31, 2017, primarily consisting of \$1.9 million for the revaluation of net deferred tax assets and \$16.0 million for the Transition Tax. As further discussed below, the Company was able to complete final or provisional calculations for certain elements of Tax Reform and the amounts and estimates are included in the financial statements. For other elements, the Company was not able to make reasonable estimates and therefore those elements have not been recorded and are accounted for in accordance with ASC 740 on the basis of the tax laws in effect before Tax Reform.

The Company's accounting for the impact of the reduction in the U.S. federal corporate tax rate on the Company's deferred tax assets and liabilities is complete. Tax Reform reduces the corporate tax rate to 21 percent, effective January 1, 2018. Consequently, the Company has recorded a net adjustment to deferred income tax expense of \$1.9 million for the year ended December 31, 2017 to revalue the Company's deferred tax assets and liabilities.

The Company's accounting for the Transition Tax is incomplete. However, reasonable estimates of certain effects were able to be calculated and, therefore, a provisional adjustment was recorded. The Transition Tax is a tax on the deemed repatriation of previously untaxed accumulated current earnings and profits (E&P) of certain foreign subsidiaries. To determine the amount of the Transition Tax, the Company must determine, in addition to other factors, the amount of post-1986 E&P of the relevant subsidiaries, as well as the amount of non-U.S. income taxes paid on such earnings. The Company was able to make a reasonable estimate of the Transition Tax and recorded a provisional Transition Tax expense of \$16.0 million. However, the Company will continue to gather additional information to more precisely compute the final amount. The Company plans to elect to pay this liability over eight years and has recorded \$14.5 million of the obligation in other long-term liabilities, with the balance recorded to accrued income taxes.

The Company's accounting for the indefinite reinvestment assertion is incomplete. However, a reasonable estimate of book and tax basis was calculated, and the Company made a provisional assertion. In general, it is the practice and intention of the Company to repatriate previously taxed earnings and to reinvest all other earnings of its non-U.S. subsidiaries. As part of Tax Reform, the Company incurred U.S. tax on substantially all of the earnings of its non-U.S. subsidiaries as part of the Transition Tax. This tax increased the Company's previously taxed earnings and will allow for the repatriation of the majority of its foreign earnings without any residual U.S. federal tax. The Company does not believe that there is an excess of the financial reporting basis over the tax basis of investments in foreign subsidiaries. Accordingly, any repatriation in excess of previously taxed earnings will be a non-taxable return of basis. This assertion is subject to change as additional information is gathered to precisely compute the book and tax basis of the Company's non-U.S. subsidiaries.

The Company's accounting for GILTI is incomplete, and reasonable estimates of the effects are not able to be made. Therefore, no provisional adjustments were recorded. Tax Reform creates a new requirement that GILTI earned by controlled foreign corporations (CFCs) must be included currently in the gross income of the CFCs' U.S. shareholder. GILTI is the excess of the shareholder's "net CFC tested income" over the net deemed tangible income return which is currently defined as the excess of (1) 10 percent of the aggregate of the U.S. shareholder's pro rata share of the qualified business asset investment of each CFC over (2) the amount of certain interest expense taken into account in the determination of net CFC-tested income.

Due to the complexity of the new GILTI tax rules, the Company is continuing to evaluate this provision of Tax Reform and the application of ASC 740. Under U.S. GAAP, the Company is allowed to make an accounting policy choice of either (1) treating taxes due on future U.S. inclusions in taxable income related to GILTI as a current-period expense when incurred (the "period cost method") or (2) factoring such amounts into the Company's measurement of its deferred taxes (the "deferred method"). The Company's selection of an accounting policy with respect to the new GILTI tax rules will depend, in part, on analyzing global income to determine whether future U.S. inclusions in taxable income related to GILTI are expected and, if so, the expected impact. Whether the Company expects to have future U.S. inclusions in taxable income related to GILTI depends not only on the current structure and estimated future results of global operations, but also on the Company's intent and ability to modify the structure and/or the business. The Company is not yet able to reasonably estimate the effect of this provision of Tax Reform and therefore has not made any adjustments related to potential GILTI tax in the financial statements. In addition, the Company has not made the accounting policy decision regarding whether to record deferred taxes on GILTI or expense taxes as incurred on GILTI.

The components of deferred tax assets and liabilities are as follows:

<i>(in thousands)</i>	December 31,	
	2017	2016
Deferred tax assets:		
Net operating loss carryforwards	\$ 21,391	\$ 32,969
Stock-based compensation	17,825	23,652
Uncertain tax positions	15,424	11,562
Employee benefits	8,603	17,187
Deferred revenue	5,134	6,382
Research and development credits	3,699	3,889
Allowance for doubtful accounts	1,462	2,078
Other	2,003	3,114
Valuation allowance	(1,906)	(1,625)
	<u>73,635</u>	<u>99,208</u>
Deferred tax liabilities:		
Other intangible assets	(29,924)	(56,195)
Property and equipment	(1,557)	(2,994)
Unremitted foreign earnings	(1,504)	49
	<u>(32,985)</u>	<u>(59,140)</u>
Net deferred tax assets	<u>\$ 40,650</u>	<u>\$ 40,068</u>

At December 31, 2017 and 2016, respectively, the Company excluded from the above table deferred tax assets associated with foreign net operating loss carryforwards of \$25.2 million and \$13.2 million and corresponding valuation allowances of \$25.2 million and \$13.2 million in a jurisdiction where the Company determined utilization is remote.

The net increase in the valuation allowance was primarily due to a change in circumstances related to the ability to utilize a net operating loss in a foreign jurisdiction. As of each reporting date, management considers new evidence, both positive and negative, that could affect the future realization of deferred tax assets. If management determines it is more likely than not that an asset, or a portion of an asset, will not be realized, a valuation allowance is recorded.

As of December 31, 2017, the Company had federal net operating loss carryforwards of \$16.7 million. These losses expire between 2024 - 2034, and are subject to limitations on their utilization. Deferred tax assets of \$0.6 million have been recorded for state operating loss carryforwards. These losses expire between 2025 - 2035, and are subject to limitations on their utilization. The Company had total foreign net operating loss carryforwards of \$66.4 million, of which \$29.6 million are not currently subject to expiration dates. The remainder, \$36.8 million, expires between 2019 - 2034. The Company had tax credit carryforwards of \$4.6 million, of which \$2.3 million are subject to limitations on their utilization. Approximately \$0.6 million of these tax credit carryforwards are not currently subject to expiration dates. The remainder, \$4.0 million, expires in various years between 2019 - 2037.

The following is a reconciliation of the total amounts of unrecognized tax benefits:

<i>(in thousands)</i>	Year Ended December 31,		
	2017	2016	2015
Unrecognized tax benefit as of January 1	\$ 15,209	\$ 16,067	\$ 16,342
Gross increases—tax positions in prior period	905	983	64
Gross decreases—tax positions in prior period	(765)	(2,502)	(850)
Gross increases—tax positions in current period	3,757	2,725	4,064
Reductions due to a lapse of the applicable statute of limitations	(847)	(927)	(2,808)
Changes due to currency fluctuation	1,414	(348)	(653)
Settlements	(16)	(789)	(92)
Unrecognized tax benefit as of December 31	<u>\$ 19,657</u>	<u>\$ 15,209</u>	<u>\$ 16,067</u>

The Company believes that it is reasonably possible that approximately \$0.8 million of uncertain tax positions may be resolved within the next twelve months as a result of settlement with a taxing authority or a lapse of the statute of limitations. Of the total unrecognized tax benefit as of December 31, 2017, \$11.7 million would affect the effective tax rate, if recognized.



The Company recognizes interest and penalties related to income taxes as income tax expense. During the years ended December 31, 2017, 2016 and 2015, the Company recorded penalty expense of \$1.1 million, \$0.8 million and \$0.3 million, respectively. The Company recorded interest expense of \$0.4 million and \$0.1 million during the years ended December 31, 2017 and 2016, respectively. As of December 31, 2017, the Company accrued a liability for penalties of \$3.9 million and interest of \$3.6 million. As of December 31, 2016, the Company accrued a liability for penalties of \$2.7 million and interest of \$2.8 million.

The Company is subject to taxation in the U.S. and various states and foreign jurisdictions. In the U.S., the Company's only major tax jurisdiction, the 2014 - 2017 tax years are open to examination by the Internal Revenue Service.

## **9. Pension and Profit-Sharing Plans**

The Company has a 401(k)/profit-sharing plan for all qualifying salaried domestic employees that permits participants to make contributions by salary reduction pursuant to Section 401(k) of the Internal Revenue Code. The Company makes matching contributions on behalf of each eligible participant in an amount equal to 100% of the first 3% and an additional 25% of the next 5%, for a maximum total of 4.25% of the employee's compensation. The Company may make a discretionary contribution based on the participant's eligible compensation, provided the employee is employed at the end of the year and has worked at least 1,000 hours. The Company also maintains various defined contribution and defined benefit pension arrangements for its international employees. The Company meets the minimum statutory funding requirements for its foreign defined benefit and contribution plans. The unfunded portion of the defined benefit obligation for each plan is accrued in other long-term liabilities.

Expenses related to the Company's retirement programs were \$10.1 million in 2017, \$9.1 million in 2016 and \$8.4 million in 2015.

## **10. Non-Compete and Employment Agreements**

Employees of the Company have signed agreements under which they have agreed not to disclose trade secrets or confidential information that, where legally permitted, restrict engagement in or connection with any business that is competitive with the Company anywhere in the world while employed by the Company (and, in some cases, for specified periods thereafter in relevant geographic areas), and that any products or technology created by them during their term of employment are the property of the Company. In addition, the Company requires all channel partners to enter into agreements not to disclose the Company's trade secrets and other proprietary information.

The Company has an employment agreement with the Chief Executive Officer. This agreement provides for, among other things, in the case of termination for reasons other than death, disability or cause and subject to non-compete and non-solicit clauses, minimum severance payments equal to two times his base salary and target bonus paid out over two years from the date of termination and up to two years of payments for health care coverage from the date of termination. The Chief Executive Officer is subject to a two-year restriction on competition and solicitation following termination of employment under the circumstances described in the contract.

The Company has a transition agreement with its Chairman of the Board. This agreement provides for, among other things, that the Chairman of the Board shall be employed by the Company until April 30, 2019 unless terminated earlier in accordance with the terms of the agreement. The Chairman of the Board shall receive salary paid in bi-monthly installments as specified in the transition agreement and restricted stock units vesting in part in February 2018 and the remainder at the end of the transition agreement, subject to the Chairman of the Board's continued employment, in accordance with the terms of the transition agreement. The Chairman of the Board will not be entitled to bonus payments during his employment pursuant to the transition agreement, but he will be eligible to participate in all of the Company's benefit plans subject to the terms of such plans. The transition agreement provides for an additional payment (less salary received and equity calculations as set forth in the transition agreement) in the event that the Chairman of the Board's employment is terminated without cause prior to April 30, 2019.

The Company also has employment agreements with several other employees, primarily in foreign jurisdictions. The terms of these employment agreements generally include annual compensation, severance payment provisions and non-compete clauses.

## 11. Stock-Based Compensation

The Company has a stock option and grant plan—the Fifth Amended and Restated 1996 Stock Option and Grant Plan (Stock Plan). The Stock Plan, as amended, authorizes the grant of up to 39.8 million shares of the Company's common stock in the form of: (i) incentive stock options (ISOs), (ii) nonqualified stock options, (iii) common stock with or without vesting or other restrictions, (iv) common stock upon the attainment of specified performance goals, (v) restricted stock awards, (vi) the right to receive cash dividends with the holders of the common stock as if the recipient held a specified number of shares of the common stock, (vii) deferred stock awards, (viii) restricted stock unit awards, (ix) stock appreciation rights and (x) cash-based awards.

The Stock Plan provides that: (i) the exercise price of an ISO must be no less than the fair value of the stock at the date of grant and (ii) the exercise price of an ISO held by an optionee who possesses more than 10% of the total combined voting power of all classes of stock must be no less than 110% of the fair market value of the stock at the time of grant. The Compensation Committee of the Board of Directors has the authority to set expiration dates no later than ten years from the date of grant (or five years for an optionee who meets the 10% criterion), payment terms, and other provisions for each grant. The majority of options granted have a four-year vesting period. Shares associated with unexercised options or reacquired shares of common stock (except those shares withheld as a result of tax withholding or net issuance) become available for option grants and common stock issuances under the Stock Plan. The Compensation Committee of the Board of Directors may, at its sole discretion, accelerate or extend the date or dates on which all or any particular award or awards granted under the Stock Plan may vest or be exercised.

In the event of a "sale event," defined in the Stock Plan as a "Transaction," all outstanding awards will be assumed or continued by the successor entity, with appropriate adjustment in the awards to reflect the transaction. In such event, except as the Compensation Committee may otherwise specify with respect to particular awards in the award agreements, if the service relationship of the holder of an award is terminated without cause within 18 months after the sale event, then all awards held by such holder will become fully vested and exercisable at that time. If there is a sale event in which the successor entity refuses to assume or continue outstanding awards, then subject to the consummation of the sale event, all awards with time-based vesting conditions will become fully vested and exercisable at the effective time of the sale event and all awards with performance-based vesting conditions may become vested and exercisable in accordance with the award agreements at the discretion of the Compensation Committee. If awards are not assumed or continued after a sale event, then all such awards will terminate at the time of the sale event. In the event of the termination of stock options or stock appreciation rights in connection with a sale event, the Compensation Committee may either make or provide for a cash payment to the holders of such awards equal to the difference between the per share transaction consideration and the exercise price of such awards or permit each holder to have at least a 15-day period to exercise such awards prior to their termination.

The Company currently issues shares related to exercised stock options or vested awards from its existing pool of treasury shares and has no specific policy to repurchase treasury shares as stock options are exercised or as awards vest. If the treasury pool is depleted, the Company will issue new shares.

Total stock-based compensation expense recognized for the years ended December 31, 2017, 2016 and 2015 is as follows:

<i>(in thousands, except per share amounts)</i>	Year Ended December 31,		
	2017	2016	2015
Cost of sales:			
Software licenses	\$ 969	\$ 701	\$ 745
Maintenance and service	2,533	1,578	1,868
Operating expenses:			
Selling, general and administrative	30,817	15,990	17,153
Research and development	18,835	15,078	14,185
Stock-based compensation expense before taxes	53,154	33,347	33,951
Related income tax benefits	(20,503)	(10,538)	(11,656)
Stock-based compensation expense, net of taxes	\$ 32,651	\$ 22,809	\$ 22,295
Net impact on earnings per share:			
Basic earnings per share	\$ (0.38)	\$ (0.26)	\$ (0.25)
Diluted earnings per share	\$ (0.38)	\$ (0.26)	\$ (0.24)

Information regarding stock option transactions is summarized below:

<i>(options in thousands)</i>	Year Ended December 31,					
	2017		2016		2015	
	Options	Weighted-Average Exercise Price	Options	Weighted-Average Exercise Price	Options	Weighted-Average Exercise Price
Outstanding, beginning of year	3,136	\$ 56.37	3,986	\$ 51.07	4,932	\$ 48.76
Granted	—	\$ —	260	\$ 94.38	57	\$ 88.10
Issued pursuant to acquisitions	—	\$ —	—	\$ —	8	\$ 12.26
Exercised	(956)	\$ 49.78	(1,082)	\$ 45.57	(975)	\$ 40.52
Forfeited	(10)	\$ 80.92	(28)	\$ 72.07	(36)	\$ 70.15
Outstanding, end of year	2,170	\$ 59.17	3,136	\$ 56.37	3,986	\$ 51.07
Vested and Exercisable, end of year	1,930	\$ 55.11	2,762	\$ 51.80	3,539	\$ 48.29

	2017	2016	2015
Weighted-Average Remaining Contractual Term <i>(in years)</i>			
Outstanding	4.10	4.62	4.85
Vested and Exercisable	3.57	4.04	4.53
Aggregate Intrinsic Value <i>(in thousands)</i>			
Outstanding	\$ 191,895	\$ 113,822	\$ 165,131
Vested and Exercisable	\$ 178,456	\$ 112,379	\$ 156,487

Historical and future expected forfeitures have not been significant and, as a result, the outstanding option amounts reflected in the tables above approximate the options expected to vest.

The fair value of each option grant is estimated on the date of grant, or date of acquisition for options issued in a business combination, using the Black-Scholes option pricing model, which was developed for use in estimating the fair value of traded options that have no vesting restrictions and are fully transferable. The Company's options have characteristics significantly different from those of traded options, and changes in input assumptions can materially affect the fair value estimates. The interest rates used were determined by using the five-year Treasury Note yield at the date of grant or date of acquisition for options issued in a business combination. The volatility was determined based on the historic volatility of the Company's stock during the preceding six years for 2017, 2016 and 2015.

The table below presents the weighted average input assumptions used and resulting fair values for options granted or issued in business combinations during each respective year:

	Year Ended December 31,	
	2016	2015
Risk-free interest rate	1.19% to 1.93%	1.18% to 1.65%
Expected dividend yield	—%	—%
Expected volatility	24%	25%
Expected term	5.7 years	5.6 years
Weighted-average fair value per share	\$23.96	\$30.83

The Company did not grant stock option awards in 2017. Forfeitures of awards are accounted for as they occur. The effect of pre-vesting forfeitures on the Company's recorded expense has historically been negligible due to the relatively low turnover of stock option holders.

The Company's determination of fair value of share-based payment awards on the date of grant using an option pricing model is affected by the Company's stock price as well as assumptions regarding a number of variables. The total estimated grant-date fair values of stock options that vested during the years ended December 31, 2017, 2016 and 2015 were \$2.9 million, \$7.4 million and \$12.3 million, respectively. As of December 31, 2017, total unrecognized estimated compensation cost related to unvested stock options granted prior to that date was \$5.0 million, which is expected to be recognized over a weighted-average period of 1.8 years. The total intrinsic values of stock options exercised during the years ended December 31, 2017, 2016 and 2015 were \$58.5 million, \$49.8 million and \$47.1 million, respectively. As of December 31, 2017, 0.2 million unvested options with an aggregate intrinsic value of \$13.4 million are expected to vest and have a weighted-average exercise price of \$91.71 and a weighted-average remaining contractual term of 8.3 years. The Company recorded cash received from the exercise of stock options of \$47.6 million and net tax benefits related to stock activity of \$20.5 million for the year ended December 31, 2017.

Information regarding stock options outstanding as of December 31, 2017 is summarized below:

<i>(options in thousands)</i>	Options Outstanding			Options Exercisable	
	Options	Weighted-Average Remaining Contractual Life (years)	Weighted-Average Exercise Price	Options	Weighted-Average Exercise Price
Range of Exercise Prices					
\$5.91 - \$40.89	437	1.74	\$ 32.01	434	\$ 32.15
\$48.97 - \$55.30	392	2.80	\$ 49.11	392	\$ 49.11
\$58.67	492	3.85	\$ 58.67	492	\$ 58.67
\$61.68 - \$95.09	849	6.05	\$ 78.06	612	\$ 72.35

Under the terms of the ANSYS, Inc. Long-Term Incentive Plan, the Company issues various restricted stock awards, which may have a market condition, an operating performance condition or a service condition, or any combination of the three. The Company granted 26,227, 35,000 and 34,450 performance-based restricted stock units with a market condition in 2017, 2016 and 2015, respectively. The percentage of the award that vests is based on the Company's performance as measured by total shareholder return relative to the appreciation of a specified stock index over the measurement period, subject to each participant's continued employment with the Company through the conclusion of the measurement period. As of December 31, 2017, 33,187 units of the total 2015 awards granted were earned and will be issued in 2018. The measurement periods for the restricted stock units granted pursuant to the Long-Term Incentive Plan are one-, two- and three-year periods beginning January 1 of the year of the grant. Each restricted stock unit relates to one share of the Company's common stock. The weighted-average fair value of each restricted stock unit granted in 2017, 2016 and 2015 was estimated on the grant date to be \$120.94, \$78.71 and \$81.61, respectively. The fair value of the restricted stock units was estimated using a Monte Carlo simulation model. The determination of the fair value of the awards was affected by the grant date and a number of variables, each of which has been identified in the chart below. Share-based compensation expense based on the fair value of the award is being recorded from the grant date through the conclusion of the three-year measurement period. Total compensation expense associated with the market condition awards recorded for the years ended December 31, 2017, 2016 and 2015 was \$1.8 million, \$2.2 million and \$3.1 million, respectively.

The table below represents the assumptions used in the Monte Carlo simulation model to determine the fair value of the restricted stock units during each respective year:

Assumptions used in Monte Carlo lattice pricing model	Year Ended December 31,		
	2017	2016	2015
Risk-free interest rate	1.5%	1.0%	1.1%
Expected dividend yield	—%	—%	—%
Expected volatility—ANSYS stock price	19%	21%	23%
Expected volatility—NASDAQ Composite Index	15%	16%	14%
Expected term	2.8 years	2.8 years	2.8 years
Correlation factor	0.70	0.65	0.60

The Company issued 104,910, 35,000 and 115,485 performance-based restricted stock awards during 2017, 2016 and 2015, respectively. Of the cumulative performance-based restricted stock awards issued, defined operating metrics were assigned to 85,132, 63,462 and 51,795 awards with grant-date fair values of \$106.95, \$84.61 and \$86.38 during 2017, 2016 and 2015, respectively. The grant-date fair value of the awards is being recorded from the grant date through the conclusion of the measurement period associated with each operating metric based on management's estimates concerning the probability of

vesting. As of December 31, 2017, 11,059 units of the total 2015 awards granted were earned and will be issued in 2018. As of December 31, 2017, a total of 69,908 units of the 2017 awards granted were earned and of this total, 34,954 units will be issued in 2018 and 34,954 will be issued in 2020. Total compensation expense associated with the awards recorded for the years ended December 31, 2017, 2016 and 2015 was \$6.6 million, \$0.4 million and \$0.4 million, respectively.

In addition, in 2017, 2016 and 2015, the Company granted restricted stock units of 762,732, 488,622 and 344,500, respectively, that will vest over a three- or four-year period with weighted-average grant-date fair values of \$109.56, \$88.51 and \$86.34, respectively. During 2017, 2016 and 2015, 261,618, 162,019 and 85,713 shares vested and were released, respectively. As of December 31, 2017, 2016 and 2015, 1,262,496, 838,327 and 571,462 units were outstanding, respectively. Total compensation expense is being recorded over the service period and was \$37.3 million, \$19.1 million and \$12.5 million for the years ended December 31, 2017, 2016 and 2015, respectively.

In conjunction with a 2015 acquisition, ANSYS issued 68,451 shares of replacement restricted stock with a weighted-average grant-date fair value of \$90.48. Of the \$6.2 million grant-date fair value, \$3.5 million, related to partially vested awards, was recorded as non-cash purchase price consideration. The remaining fair value will be recognized as stock compensation expense through the conclusion of the service period. Total compensation expense associated with the awards recorded for the years ended December 31, 2017, 2016 and 2015 was \$0.6 million, \$1.2 million and \$0.6 million, respectively.

The Company has granted deferred stock awards to non-affiliate Independent Directors, which are rights to receive shares of common stock upon termination of service as a Director. In 2015 and prior, the deferred stock awards were granted quarterly in arrears and vested immediately upon grant. Associated with these awards, the Company established a non-qualified 409(a) deferred compensation plan with assets held under a rabbi trust to provide Directors an opportunity to diversify their vested awards. During open trading windows and at their elective option, the Directors may convert their Company shares into a variety of non-Company-stock investment options in order to diversify their holdings. As of December 31, 2017, 29,500 shares have been diversified and 159,599 undiversified deferred stock awards have vested with the underlying shares remaining unissued until the service termination of the respective Director owners. In 2017 and 2016, the Company granted 18,018 and 38,400 deferred stock awards, respectively, which will vest in full on the one-year anniversary of the grant. Total compensation expense associated with the awards recorded for the years ended December 31, 2017, 2016 and 2015 was \$2.6 million, \$1.9 million and \$4.0 million, respectively.

## 12. Stock Repurchase Program

Under the Company's stock repurchase program, the Company repurchased shares as follows:

<i>(in thousands, except per share data)</i>	Year Ended December 31,		
	2017	2016	2015
Number of shares repurchased	2,750	3,700	3,833
Average price paid per share	\$ 122.20	\$ 90.90	\$ 88.16
Total cost	\$ 336,042	\$ 336,335	\$ 337,910

In February 2018, the Company's Board of Directors increased the number of shares authorized for repurchase to a total of 5.0 million shares under the stock repurchase program. As of December 31, 2017, 2.8 million shares remained available for repurchase under the program.

## 13. Employee Stock Purchase Plan

The Company's 1996 Employee Stock Purchase Plan (the "Purchase Plan") was adopted by the Board of Directors on April 19, 1996 and was subsequently approved by the Company's stockholders. The stockholders approved an amendment to the Purchase Plan in May 2016 to increase the number of shares available for offerings to 1.8 million shares. The Purchase Plan is administered by the Compensation Committee. Offerings under the Purchase Plan commence on each February 1 and August 1, and have a duration of six months. An employee who owns or is deemed to own shares of stock representing in excess of 5% of the combined voting power of all classes of stock of the Company may not participate in the Purchase Plan.

During each offering, an eligible employee may purchase shares under the Purchase Plan by authorizing payroll deductions of up to 10% of his or her cash compensation during the offering period. The maximum number of shares that may be purchased by any participating employee during any offering period is limited to 3,840 shares (as adjusted by the Compensation

Committee from time to time). Unless the employee has previously withdrawn from the offering, his or her accumulated payroll deductions will be used to purchase common stock on the last business day of the period at a price equal to 90% of the fair market value of the common stock on the first or last day of the offering period, whichever is lower. Under applicable tax rules, an employee may not accrue the right to purchase more than \$25,000 of common stock, based on the grant-date fair value, in any calendar year in which the option is outstanding at any time. As of December 31, 2017, 1.5 million shares of common stock had been issued under the Purchase Plan. The total compensation expense recorded under the Purchase Plan during the years ended December 31, 2017, 2016 and 2015 was \$1.2 million, \$1.2 million and \$1.0 million, respectively.

#### 14. Leases

##### *Office Space*

The Company's executive offices and those related to certain domestic product development, marketing, production and administration are located in a 186,000 square foot office facility in Canonsburg, Pennsylvania. The term of the lease is 183 months, beginning on October 1, 2014 and expiring on December 31, 2029. Absent the exercise of options in the lease for additional rentable space or early lease termination, the Company's base rent (inclusive of property taxes and certain operating expenses) will be \$4.3 million per annum for the first five years of the lease term, \$4.5 million per annum for years six through ten and \$4.7 million per annum for years eleven through fifteen. The Company incurred \$4.4 million in lease expense related to this facility during each of the years ended December 31, 2017, 2016 and 2015.

The Company has entered into various other noncancellable operating leases for office space.

Office space lease expense totaled \$17.1 million, \$16.9 million and \$16.5 million for the years ended December 31, 2017, 2016 and 2015, respectively. Future minimum lease payments, including termination fees, under noncancellable operating leases for office space in effect at December 31, 2017 are as follows:

*(in thousands)*

2018	\$ 14,139
2019	11,570
2020	8,785
2021	7,675
2022	7,046
Thereafter	15,898
Total	<u>\$ 65,113</u>

#### 15. Royalty Agreements

The Company has entered into various renewable, nonexclusive license agreements under which the Company has been granted access to the licensor's technology and the right to sell the technology in the Company's product line. Royalties are payable to developers of the software at various rates and amounts, which generally are based upon unit sales, revenue or flat fees. Royalty fees are reported in cost of goods sold and were \$16.0 million, \$13.1 million and \$11.8 million for the years ended December 31, 2017, 2016 and 2015, respectively.

## 16. Geographic Information

Revenue to external customers is attributed to individual countries based upon the location of the customer. Revenue by geographic area is as follows:

<i>(in thousands)</i>	Year Ended December 31,		
	2017	2016	2015
United States	\$ 417,342	\$ 367,937	\$ 354,433
Japan	126,262	120,160	104,299
Germany	108,216	99,814	94,546
South Korea	63,011	56,790	55,142
France	53,672	49,294	49,444
Canada	13,824	13,284	13,314
Other European	153,826	139,813	145,985
Other international	159,097	141,373	125,590
Total revenue	<u>\$ 1,095,250</u>	<u>\$ 988,465</u>	<u>\$ 942,753</u>

Property and equipment by geographic area is as follows:

<i>(in thousands)</i>	December 31,	
	2017	2016
United States	\$ 45,498	\$ 43,810
Europe	5,059	4,753
India	3,704	3,033
Other international	2,835	3,081
Total property and equipment, net	<u>\$ 57,096</u>	<u>\$ 54,677</u>

## 17. Unconditional Purchase Obligations

The Company has entered into various unconditional purchase obligations which primarily include royalties, software licenses and long-term purchase contracts for network, communication and office maintenance services. The Company expended \$14.1 million, \$7.2 million and \$5.3 million related to unconditional purchase obligations that existed as of the beginning of each year for the years ended December 31, 2017, 2016 and 2015, respectively. Future expenditures under unconditional purchase obligations in effect as of December 31, 2017 are as follows:

<i>(in thousands)</i>	
2018	\$ 22,408
2019	18,271
2020	6,706
2021	4,545
2022	—
Total	<u>\$ 51,930</u>

## 18. Restructuring

During the fourth quarter of 2016, the Company initiated workforce realignment activities to reallocate resources to align with the Company's future strategic plans. The Company incurred related restructuring charges as follows:

<i>(in thousands)</i>	<b>Gross</b>	<b>Net of Tax</b>
Q4 2016	\$ 3,419	\$ 2,355
Q1 2017	9,273	6,176
Q2 2017	2,000	1,435
Q3 2017	466	331
Total restructuring charges	<b>\$ 15,158</b>	<b>\$ 10,297</b>

The restructuring charges are included in the presentation of cost of software licenses; cost of maintenance and service; research and development expense; and selling, general and administrative expense. During the year ended December 31, 2017, the Company paid \$12.5 million of the gross charges. As of December 31, 2017, \$2.2 million of the gross charges incurred to date remains unpaid. The Company completed the workforce realignment activities as of September 30, 2017.

## 19. Contingencies and Commitments

The Company is subject to various investigations, claims and legal proceedings that arise in the ordinary course of business, including commercial disputes, labor and employment matters, tax audits, alleged infringement of intellectual property rights and other matters. In the opinion of the Company, the resolution of pending matters is not expected to have a material adverse effect on the Company's consolidated results of operations, cash flows or financial position. However, each of these matters is subject to various uncertainties and it is possible that an unfavorable resolution of one or more of these proceedings could materially affect the Company's results of operations, cash flows or financial position.

An Indian subsidiary of the Company has several service tax audits pending that have resulted in formal inquiries being received on transactions through mid-2012. The Company could incur tax charges and related liabilities of approximately \$7.5 million. The service tax issues raised in the Company's notices and inquiries are very similar to the case, M/s Microsoft Corporation (I) (P) Ltd. Vs Commissioner of Service Tax, New Delhi, wherein the Delhi Customs, Excise and Service Tax Appellate Tribunal (CESTAT) has passed a favorable ruling to Microsoft. The Company can provide no assurances on whether the Microsoft case's favorable ruling will be challenged in higher courts or on the impact that the present Microsoft case's decision will have on the Company's cases. The Company is uncertain as to when these service tax matters will be concluded.

A French subsidiary of the Company previously received notice that the French taxing authority rejected the Company's 2012 research and development credit. The Company contested the decision and received a favorable outcome during the first half of 2017. There are currently no challenges to other years' research and development credits for this subsidiary; however, other years are subject to future review and audit.

The Company sells software licenses and services to its customers under proprietary software license agreements. Each license agreement contains the relevant terms of the contractual arrangement with the customer, and generally includes certain provisions for indemnifying the customer against losses, expenses and liabilities from damages that are incurred by or awarded against the customer in the event the Company's software or services are found to infringe upon a patent, copyright or other proprietary right of a third party. To date, the Company has not had to reimburse any of its customers for any losses related to these indemnification provisions and no material claims asserted under these indemnification provisions are outstanding as of December 31, 2017. For several reasons, including the lack of prior material indemnification claims, the Company cannot determine the maximum amount of potential future payments, if any, related to such indemnification provisions.



**ANSYS, INC. AND SUBSIDIARIES**  
**Valuation and Qualifying Accounts**

<i>(in thousands)</i>	Description	Balance at Beginning of Year	Additions: Charges to Costs and Expenses	Deductions: Returns and Write-Offs	Balance at End of Year
	Year ended December 31, 2017				
	Allowance for doubtful accounts	\$ 5,700	\$ 1,474	\$ 374	\$ 6,800
	Year ended December 31, 2016				
	Allowance for doubtful accounts	\$ 5,200	\$ 2,009	\$ 1,509	\$ 5,700
	Year ended December 31, 2015				
	Allowance for doubtful accounts	\$ 5,500	\$ 1,304	\$ 1,604	\$ 5,200

<u>Exhibit No.</u>	<u>Exhibit</u>
3.1	Restated Certificate of Incorporation of the Company (filed as Exhibit 3.1 to the Quarterly Report on Form 10-Q for the fiscal quarter ended June 30, 1996 and incorporated herein by reference).
3.2	Certificate of Amendment to the Company's Restated Certificate of Incorporation as filed with the Secretary of State of the State of Delaware (filed as Exhibit 3.1 to the Company's Current Report on Form 8-K, filed June 21, 2006, and incorporated herein by reference).
3.3	Certificate of Amendment to the Company's Restated Certificate of Incorporation as filed with the Secretary of State of the State of Delaware (filed as Exhibit 3.1 to the Company's Current Report on Form 8-K, filed May 17, 2011, and incorporated herein by reference).
3.4	Certificate of Amendment to the Company's Restated Certificate of Incorporation as filed with the Secretary of State of the State of Delaware (filed as Exhibit 3.1 to the Company's Current Report on Form 8-K, filed May 21, 2012, and incorporated herein by reference).
3.5	Second Amended and Restated By-laws of the Company (filed as Exhibit 3.1 to the Company's Current Report on Form 8-K, filed February 19, 2008, and incorporated herein by reference).
3.6	Amendment No. 1 to the Second Amended and Restated By-laws of the Company (filed as Exhibit 3.1 to the Company's Current Report on Form 8-K, filed July 23, 2008, and incorporated herein by reference).
3.7	Amendment No. 2 to the Second Amended and Restated By-laws of the Company (filed as Exhibit 3.1 to the Company's Current Report on Form 8-K, filed December 20, 2011, and incorporated herein by reference).
3.8	Amendment No. 3 to the Second Amended and Restated By-laws of ANSYS, Inc. (filed as Exhibit 3.1 to the Company's Current Report on Form 8-K filed August 7, 2015, and incorporated herein by reference).
3.9	Amendment No. 4 to the Second Amended and Restated By-laws of ANSYS, Inc. (filed as Exhibit 3.9 to the Company's Annual Report on Form 10-K, filed February 23, 2017, and incorporated herein by reference).
3.10	Third Amended and Restated By-laws of the Company (filed as Exhibit 3.1 to the Company's Current Report on Form 8-K, filed January 19, 2018, and incorporated herein by reference).
10.1	ANSYS, Inc. Second Amended and Restated Employee Stock Purchase Plan (filed as Exhibit 10.1 to the Quarterly Report on Form 10-Q for the fiscal quarter ended September 30, 2007 and incorporated herein by reference).*
10.2	The Company's Pension Plan and Trust, as amended (filed as Exhibit 10.20 to the Company's Registration Statement on Form S-1 (File No. 333-4278) and incorporated herein by reference).*(P)
10.3	Form of Director Indemnification Agreement (filed as Exhibit 10.21 to the Company's Registration Statement on Form S-1 (File No. 333-4278) and incorporated herein by reference).(P)
10.4	Employment Agreement between the Registrant and James E. Cashman III dated as of April 21, 2003 (filed as Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2003 and incorporated herein by reference).*
10.5	Incentive Stock Option Agreement under the ANSYS, Inc. Second Amended and Restated 1996 Stock Option and Grant Plan (filed as Exhibits 99.1 to the Company's Current Report on Form 8-K, filed February 8, 2005, and incorporated herein by reference).*
10.6	Non-Qualified Stock Option Agreement under the ANSYS, Inc. Second Amended and Restated 1996 Stock Option and Grant Plan (filed as Exhibits 99.2 to the Company's Current Report on Form 8-K, filed February 8, 2005, and incorporated herein by reference).*
10.7	Incentive Stock Option Agreement under the ANSYS, Inc. Second Amended and Restated 1996 Stock Option and Grant Plan (filed as Exhibits 99.3 to the Company's Current Report on Form 8-K, filed February 8, 2005, and incorporated herein by reference).*
10.8	Non-Qualified Stock Option Agreement under the ANSYS, Inc. Second Amended and Restated 1996 Stock Option and Grant Plan (filed as Exhibits 99.4 to the Company's Current Report on Form 8-K, filed February 8, 2005, and incorporated herein by reference).*
10.9	Non-Qualified Stock Option Agreement under the ANSYS, Inc. Second Amended and Restated 1996 Stock Option and Grant Plan (filed as Exhibits 99.5 to the Company's Current Report on Form 8-K, filed February 8, 2005, and incorporated herein by reference).*
10.10	Options Granted to Independent Directors Related to the 2005 Annual Meeting of Stockholders on May 10, 2005 (filed as a disclosure in the Company's Current Report on Form 8-K, filed May 13, 2005, and incorporated herein by reference).*

- 10.11 Amendment to Non-Affiliate Independent Director Compensation on February 9, 2006 (filed as a disclosure in the Company's Current Report on Form 8-K, filed February 15, 2006, and incorporated herein by reference).\*
- 10.12 Form of Deferred Stock Unit Agreement under the Third Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (filed as Exhibit 10.2 to the Company's Current Report on Form 8-K, filed July 6, 2006, and incorporated herein by reference).\*
- 10.13 Deferred Stock Unit Agreement under the Third Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (filed as Exhibit 10.4 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2008 and incorporated herein by reference).\*
- 10.14 Amended and Restated ANSYS, Inc. Cash Bonus Plan (filed as Exhibit 10.5 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2008 and incorporated herein by reference).\*
- 10.15 First Amendment of the Employment Agreement Between the Company and James E. Cashman III as of November 6, 2008 (filed as Exhibit 10.6 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2008 and incorporated herein by reference).\*
- 10.16 ANSYS, Inc. Executive Severance Plan, dated February 17, 2010 (filed as Exhibit 10.2 to the Company's Current Report on Form 8-K, filed February 23, 2010, and incorporated herein by reference).\*
- 10.17 Form of Award Notice under the ANSYS, Inc. Long-Term Incentive Plan (filed as Exhibit 10.3 to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2010 and incorporated herein by reference).\*
- 10.18 Second Amendment of the Employment Agreement Between ANSYS, Inc. and James E. Cashman III dated March 14, 2011 (filed as Exhibit 10.1 to the Company's Current Report on Form 8-K, filed March 18, 2011, and incorporated herein by reference).\*
- 10.19 Form of Employee Incentive Stock Option Agreement under the Fourth Amended and Restated ANSYS, Inc. Stock Option and Grant Plan (filed as Exhibit 10.5 to the Company's Current Report on Form 8-K, filed March 18, 2011, and incorporated herein by reference).\*
- 10.20 Form of Employee Non-Qualified Stock Option Agreement under the Fourth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (filed as Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q, filed May 2, 2013, and incorporated herein by reference).\*
- 10.21 Form of Employee Director Non-Qualified Stock Option Agreement under the Fourth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (filed as Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q, filed May 2, 2013, and incorporated herein by reference).\*
- 10.22 Form of Non-Employee Director Non-Qualified Stock Option Agreement under the Fourth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (filed as Exhibit 10.3 to the Company's Quarterly Report on Form 10-Q, filed May 2, 2013, and incorporated herein by reference).\*
- 10.23 Form of Non-Qualified Option Transfer Acknowledgment under the Fourth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (filed as Exhibit 10.4 to the Company's Quarterly Report on Form 10-Q, filed May 2, 2013, and incorporated herein by reference).\*
- 10.24 Form of Indemnification Agreement between ANSYS, Inc. and Non-Employee Directors (filed as Exhibit 10.1 to the Company's Current Report on Form 8-K, filed March 20, 2013, and incorporated herein by reference).
- 10.25 First Amendment to Letter Agreement between ANSYS, Inc. and Maria T. Shields, dated March 14, 2011 (filed as Exhibit 10.2 to the Company's Current Report on Form 8-K, filed March 18, 2011, and incorporated herein by reference).\*
- 10.26 Consent of the Compensation Committee of the ANSYS, Inc. Board of Directors dated March 14, 2011 (filed as Exhibit 10.3 to the Company's Current Report on Form 8-K, filed March 18, 2011, and incorporated herein by reference).\*
- 10.27 Fourth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (filed as Exhibit 10.1 to the Company's Current Report on Form 8-K, filed May 17, 2011, and incorporated herein by reference).\*
- 10.28 Lease by and between ANSYS, Inc. and Quattro Investment Group, L.P., dated as of September 14, 2012 (filed as Exhibit 10.1 to the Company's Current Report on Form 8-K, filed September 18, 2012, and incorporated herein by reference).
- 10.29 Form of Restricted Stock Unit Agreement under the Fourth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (filed as Exhibit 10.39 to the Company's Annual Report on Form 10-K, filed February 27, 2014, and incorporated herein by reference).\*

- 10.30 ANSYS, Inc. Second Amended and Restated Long-Term Incentive Plan, dated March 5, 2014 (filed as Exhibit 10.1 to the Company's Current Report on Form 8-K, filed March 11, 2014, and incorporated herein by reference).\*
- 10.31 Form of Performance-Based Restricted Stock Unit (Total Shareholder Return) Award under the ANSYS, Inc. Second Amended and Restated Long-Term Incentive Plan (filed as Exhibit 10.2 to the Company's Current Report on Form 8-K, filed March 11, 2014, and incorporated herein by reference).\*
- 10.32 Form of Performance-Based Restricted Stock Unit Award under the ANSYS, Inc. Fourth Amended and Restated 1996 Stock Option and Grant Plan (filed as Exhibit 10.3 to the Company's Current Report on Form 8-K, filed March 11, 2014, and incorporated herein by reference).\*
- 10.33 Employment Agreement between ANSYS, Inc. and Ajei S. Gopal, dated August 29, 2016 (filed as Exhibit 10.1 to the Company's Current Report on Form 8-K filed August 29, 2016, and incorporated herein by reference).\*
- 10.34 Form of Restricted Stock Unit Agreement with Ajei S. Gopal (filed as Exhibit 10.2 to the Company's Current Report on Form 8-K filed August 29, 2016, and incorporated herein by reference).\*
- 10.35 Form of Non-Qualified Stock Option Agreement with Ajei S. Gopal (filed as Exhibit 10.3 to the Company's Current Report on Form 8-K filed August 29, 2016, and incorporated herein by reference).\*
- 10.36 Transition Agreement between ANSYS, Inc. and James E. Cashman III, effective as of December 31, 2016 (filed as Exhibit 10.1 to the Company's Current Report on Form 8-K filed December 23, 2016, and incorporated herein by reference).\*
- 10.37 ANSYS, Inc. Third Amended and Restated Employee Stock Purchase Plan (filed as Appendix 2 to the registrant's Definitive Proxy Statement on Schedule 14A filed with the SEC on March 31, 2016 and incorporated herein by reference).\*
- 10.38 Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (filed as Appendix 1 to the registrant's Definitive Proxy Statement on Schedule 14A filed with the SEC on March 31, 2016 and incorporated herein by reference).\*
- 10.39 Form of Restricted Stock Unit Agreement under the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (filed as Exhibit 10.35 to the Company's Annual Report on Form 10-K filed February 23, 2017, and incorporated herein by reference).\*
- 10.40 Form of Non-Qualified Stock Option Agreement under the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (filed as Exhibit 10.36 to the Company's Annual Report on Form 10-K filed February 23, 2017, and incorporated herein by reference).\*
- 10.41 Form of Award Notice under the Fifth Amended and Restated ANSYS, Inc. 1996 Stock Option and Grant Plan (filed as Exhibit 10.37 to the Company's Annual Report on Form 10-K filed February 23, 2017, and incorporated herein by reference).\*
- 10.42 Form of Restricted Stock Unit Agreement (Non-Employee Directors) under the Fifth Amended and Restated Stock Option and Grant Plan (filed as Exhibit 10.38 to the Company's Annual Report on Form 10-K filed February 23, 2017, and incorporated herein by reference).\*
- 10.43 Agreement and General Release by and between the Company and Walid Abu-Hadba, dated May 1, 2017 (filed as Exhibit 10.1 to the Company's Current Report on Form 8-K filed May 1, 2017, and incorporated herein by reference).\*
- 14.1 ANSYS, Inc. - Code of Business Conduct and Ethics, effective July 29, 2016 (filed as Exhibit 14.1 to the Company's Current Report on Form 8-K filed August 4, 2016, and incorporated herein by reference).
- 14.2 Amended and restated ANSYS, Inc. - Code of Business Conduct and Ethics, effective February 7, 2018 (filed as Exhibit 14.1 to the Company's Current Report on Form 8-K filed February 9, 2018, and incorporated herein by reference).
- 21.1 Subsidiaries of the Registrant; filed herewith.
- 23.1 Consent of Deloitte & Touche LLP, independent registered public accounting firm.
- 24.1 Powers of Attorney. Contained on the Signatures page of the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2017 and incorporated herein by reference.
- 31.1 Certification of Chief Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
- 31.2 Certification of Chief Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.

32.1	Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
32.2	Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema
101.CAL	XBRL Taxonomy Extension Calculation Linkbase
101.DEF	XBRL Taxonomy Extension Definition Linkbase
101.LAB	XBRL Taxonomy Extension Label Linkbase
101.PRE	XBRL Taxonomy Extension Presentation Linkbase

\* *Indicates management contract or compensatory plan, contract or arrangement.*

(P) *Indicates a paper filing.*



## POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Ajei S. Gopal, his or her attorney-in-fact, with the power of substitution, for such person in any and all capacities, to sign any amendments to this Report on Form 10-K, and to file the same, with exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, hereby ratifying and confirming all that said attorney-in-fact, or substitute or substitutes, may do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, this Annual Report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated below.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ AJEI S. GOPAL</u> <b>Ajei S. Gopal</b>	President and Chief Executive Officer (Principal Executive Officer)	February 22, 2018
<u>/s/ MARIA T. SHIELDS</u> <b>Maria T. Shields</b>	Chief Financial Officer (Principal Financial Officer and Accounting Officer)	February 22, 2018
<u>/s/ JAMES E. CASHMAN III</u> <b>James E. Cashman III</b>	Non-Executive Chairman of the Board of Directors	February 22, 2018
<u>/s/ GUY DUBOIS</u> <b>Guy Dubois</b>	Director	February 22, 2018
<u>/s/ Dr. Alec D. Gallimore</u> <b>Dr. Alec D. Gallimore</b>	Director	February 22, 2018
<u>/s/ RONALD W. HOVSEPIAN</u> <b>Ronald W. Hovsepian</b>	Lead Independent Director	February 22, 2018
<u>/s/ WILLIAM R. MCDERMOTT</u> <b>William R. McDermott</b>	Director	February 22, 2018
<u>/s/ BRADFORD C. MORLEY</u> <b>Bradford C. Morley</b>	Director	February 22, 2018
<u>/s/ BARBARA V. SCHERER</u> <b>Barbara V. Scherer</b>	Director	February 22, 2018
<u>/s/ MICHAEL C. THURK</u> <b>Michael C. Thurk</b>	Director	February 22, 2018
<u>/s/ PATRICK J. ZILVITIS</u> <b>Patrick J. Zilvitis</b>	Director	February 22, 2018

**Subsidiaries of the Registrant as of December 31, 2017****Jurisdiction of Incorporation**

Esterel Technologies, Inc.	California
Gear Design Solutions, Inc.	Delaware
Fluent China Holdings Limited	Barbados
ANSYS Belgium, S.A.	Belgium
ANSYS Canada Limited	Canada
2011767 Ontario Inc.	Canada
ANSYS France SAS	France
Esterel Technologies, SAS	France
ANSYS Germany GmbH	Germany
ANSYS medini Technologies AG	Germany
ANSYS Hong Kong Ltd.	Hong Kong
ANSYS Software Private Limited	India
Apache Design Solutions Private Ltd.	India
Sequence Design India Private Ltd.	India
ANSYS Software Ltd.	Israel
ANSYS Italia, Srl.	Italy
ANSYS Japan K.K.	Japan
ANSYS Korea LLC	Korea
ANSYS Luxembourg Holding Company sarl	Luxembourg
ANSYS Luxembourg Sarl	Luxembourg
Fluent Software (Shanghai) Co., Limited	People's Republic of China
ANSYS-Fluent (Shanghai) Engineering Software Trading Co., Ltd.	People's Republic of China
Apache Science and Technology (Shanghai) Co. Ltd.	People's Republic of China
Apache Design Solutions, Inc.	People's Republic of China
ANSYS OOO	Russia
ANSYS Singapore Ltd.	Singapore
ANSYS Iberia S.L.	Spain
ANSYS Sweden, AB	Sweden
ANSYS Switzerland GmbH	Switzerland
Taiwan ANSYS Technologies Co.	Taiwan
ANSYS UK Limited	United Kingdom
Computational Engineering, Inc.	North Carolina
CEI GmbH	Germany
CEI Software Co., Ltd.	Japan
Computational Engineering India Pvt., Ltd.	India
3DSim LLC	Delaware



**CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

We consent to the incorporation by reference in Registration Statement Nos. 333-08613, 333-69506, 333-110728, 333-137274, 333-152765, 333-174670, 333-177030, 333-196393, 333-206111 and 333-212412 on Form S-8 of our reports dated February 22, 2018, relating to the consolidated financial statements and financial statement schedule of ANSYS, Inc. and subsidiaries, and the effectiveness of ANSYS, Inc. and subsidiaries' internal control over financial reporting, appearing in this Annual Report on Form 10-K of ANSYS, Inc. and subsidiaries for the year ended December 31, 2017.

/s/ Deloitte & Touche LLP  
Pittsburgh, Pennsylvania  
February 22, 2018

## CHIEF EXECUTIVE OFFICER CERTIFICATION

I, Ajei S. Gopal, certify that:

1. I have reviewed this annual report on Form 10-K of ANSYS, Inc. (“ANSYS”);
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of ANSYS as of, and for, the periods presented in this report;
4. ANSYS’s other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for ANSYS and have:
  - a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to ANSYS, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
  - b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
  - c. Evaluated the effectiveness of ANSYS’s disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
  - d. Disclosed in this report any change in ANSYS’s internal control over financial reporting that occurred during ANSYS’s most recent fiscal quarter (ANSYS’s fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, ANSYS’s internal control over financial reporting; and
5. ANSYS’s other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to ANSYS’s auditors and the audit committee of ANSYS’s board of directors (or persons performing the equivalent functions):
  - a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect ANSYS’s ability to record, process, summarize and report financial information; and
  - b. Any fraud, whether or not material, that involves management or other employees who have a significant role in ANSYS’s internal control over financial reporting.

Date: February 22, 2018

*/s/ Ajei S. Gopal*

Ajei S. Gopal

President and Chief Executive Officer

## CHIEF FINANCIAL OFFICER CERTIFICATION

I, Maria T. Shields, certify that:

1. I have reviewed this annual report on Form 10-K of ANSYS, Inc. (“ANSYS”);
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of ANSYS as of, and for, the periods presented in this report;
4. ANSYS’s other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for ANSYS and have:
  - a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to ANSYS, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
  - b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
  - c. Evaluated the effectiveness of ANSYS’s disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
  - d. Disclosed in this report any change in ANSYS’s internal control over financial reporting that occurred during ANSYS’s most recent fiscal quarter (ANSYS’s fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, ANSYS’s internal control over financial reporting; and
5. ANSYS’s other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to ANSYS’s auditors and the audit committee of ANSYS’s board of directors (or persons performing the equivalent functions):
  - a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect ANSYS’s ability to record, process, summarize and report financial information; and
  - b. Any fraud, whether or not material, that involves management or other employees who have a significant role in ANSYS’s internal control over financial reporting.

Date: February 22, 2018

*/s/ Maria T. Shields*

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Maria T. Shields

Chief Financial Officer

CERTIFICATION PURSUANT TO  
18 U.S.C. SECTION 1350  
AS ADOPTED PURSUANT TO  
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of ANSYS, Inc. (the "Company") on Form 10-K for the year ended December 31, 2017 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Ajei S. Gopal, President and Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

- (1) The Report fully complies with requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

This certification is provided solely pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, and shall not be deemed to be part of the Report or filed for any purpose whatsoever.

*/s/ Ajei S. Gopal*

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Ajei S. Gopal

President and Chief Executive Officer

February 22, 2018

CERTIFICATION PURSUANT TO  
18 U.S.C. SECTION 1350  
AS ADOPTED PURSUANT TO  
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of ANSYS, Inc. (the "Company") on Form 10-K for the year ended December 31, 2017 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Maria T. Shields, Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

- (1) The Report fully complies with requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

This certification is provided solely pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, and shall not be deemed to be part of the Report or filed for any purpose whatsoever.

*/s/ Maria T. Shields*

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Maria T. Shields  
Chief Financial Officer  
February 22, 2018