ANSYS INC
Form 10-K
February 28, 2019

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549
FORM 10-K
(Mark One)

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

For the fiscal year ended
December 31, 2018
OR

	TRANSITION REPORT PURSUANT TO SECTION
o	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	04-3219960
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
2600 ANSYS Drive, Canonsburg, PA	15317
(Address of principal executive offices)	(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	The Nasdaq Global Select Market
(Title of each class)	(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 x 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 x

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 x No ¨

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted 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 such files). Yes x 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 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. x

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. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer x	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 Rule 12b-2 of the Act). Yes ¨ No x

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 29, 2018 as reported on the Nasdaq Global Select Market, was $11,318,000,000.

The number of shares of the registrant's Common Stock, par value $.01 per share, outstanding as of February 22, 2019 was 83,771,828 shares.

Documents Incorporated By Reference:

Portions of the Proxy Statement for the Registrant's 2019 Annual Meeting of Stockholders are incorporated by reference into Part III.

ANSYS, Inc.
ANNUAL REPORT ON FORM 10-K FOR FISCAL YEAR 2018
Table of Contents

PART I

PART II

PART III

PART IV

Table of Contents

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, 2018, unless otherwise indicated.

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 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.

3

Table of Contents

- The Company's intention to repatriate previously taxed earnings in excess of working capital needs 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 assessment of its ability to realize deferred tax assets.
- The Company's performance expectations related to its partnerships and strategic alliances.
- The Company's expectations regarding acquisitions and integrating such acquired companies to realize the benefits of cost reductions and other synergies relating thereto.

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.

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 3,400 people as of December 31, 2018. 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 operates and reports as one segment.

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™.

Table of Contents

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.

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™, 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.

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.

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. The Company also provides comprehensive topology optimization tools that engineers use to design structural components to meet loading requirements with minimal material and component weight. The Company offers a complete simulation workflow for additive manufacturing that allows reliable 3D printing by simulating the laser sintering process and delivering compensated CAD geometries that ensure reliable printed parts.

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.

Electromagnetics

The Company's electromagnetics 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.

Table of Contents

Embedded Software

The Company's SCADE® 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 automotive applications. SCADE software supports the entire development workflow, from requirements analysis and design, through verification, implementation and deployment. SCADE 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.

3D Design

The Company’s Discovery™ 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.

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 non-commercial 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's total research and development expenses were $233.8 million, $202.7 million and $183.1 million in 2018, 2017 and 2016, respectively, or 18.1%, 18.5% and 18.5% of total revenue, respectively. As of December 31, 2018, the Company's product development staff consisted of approximately 1,200 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.

Table of Contents

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

- In February 2019, the Company released ANSYS 2019 R1. The new ANSYS Fluent® user experience improves the workflow process without compromising accuracy. Engineers benefit from the complete, single-window solution within ANSYS Fluent. ANSYS Motion™ was released with the most-powerful multibody dynamics solution. New offerings in the electronics and electromagnetics suite include an EMI Scanner, electromigration analysis and noise-vibration-harshness (NVH) capabilities. In structures, ANSYS Mechanical added thermal compliance to enable the generation of designs that maximize heat transfer using topology optimization. A new semi-implicit method allows efficient solution of problems that involve both large strain and large deformation. ANSYS Additive Suite™ includes ANSYS Additive Science™, an exploratory environment for engineers to determine how process parameters affect meltpool sizes and material porosity. Improvements to the SCADE suite for automotive make it simpler and faster to comply with industry standards like AUTOSAR and ISO 26262 for model-based systems and software in autonomous vehicles. ANSYS VRXPERIENCE™ integrates two new camera models, enabling users to test the perception algorithm in night driving conditions. New features in ANSYS medini® analyze allow users to more quickly and accurately perform functional safety analysis for DO-178C and other standards on aircraft systems. ANSYS SPEOS™ strengthens predictive design capabilities for creating, testing and validating a virtual design in a fast iteration loop, ensuring compliance with international standards and regulations. Topology optimization has been added to ANSYS Discovery Live, taking a leap forward in making digital exploration and generative design accessible for every engineer.
- In September 2018, the Company released ANSYS 19.2 with faster problem-solving capabilities. In fluids, ANSYS 19.2 delivered new features to accelerate computational fluid dynamics simulations using a task-based workflow for watertight geometries and Mosaic meshing technology, empowering more engineers to get accurate results faster and with less training. ANSYS 19.2 introduced System Coupling 2.0 for multiphysics simulation with improved and consistent performance for any scenario, enabling HPC for multiphysics simulations. Engineers benefit from new functionality to improve workflow for semiconductors, specifically those used in the automotive and autonomous vehicle industries, with dedicated ISO 26262 support to meet safety regulations in ANSYS medini analyze. ANSYS introduced ANSYS VRXPERIENCE, providing virtual reality simulation and validation for autonomous vehicle simulation, complex systems such as intelligent headlamps, interior and exterior lighting, autonomous vehicles controls and HMI validation. A new product bundle, ANSYS SPEOS, provides a complete solution for designing and simulating illumination, interior and exterior lighting, cameras and lidars. New inverse analysis in the ANSYS structural suite, material designer and topology optimization developments give engineers more simulation options. Inverse Analysis predicts the shape of a component, helping achieve the desired shape during operation. Additive solutions provided improved robustness for both ANSYS Additive Print™ and ANSYS Workbench Additive, including physics-driven lattice optimization. In topology optimization, ANSYS 19.2 added loading options; manufacturing constraints that are ideal for additive manufacturing; and a unique lattice optimization capability. In the electromagnetics suite, new advancements in multi-channel radar system simulation include a lightweight geometry modeler that enables rapid meshing and an efficient actor movement in pulse-by-pulse road scene simulation resulting in 20 times faster processing.
- In May 2018, the Company released ANSYS 19.1 with new simulation-based digital twin functionality. ANSYS Twin Builder™ is a first-of-its-kind product, enabling customers to build, validate and deploy simulation-based digital twins. A digital twin combines accurate physics-based virtual replicas of a product with data collected using industrial internet of things connectivity platforms, providing intelligence and predictive maintenance insights in real-world operating conditions. ANSYS 19.1 also provided updates across all physics and delivered new metal additive manufacturing solutions, empowering customers to quickly test their product designs virtually before printing a part. ANSYS Additive Suite enables designers to optimize weight reduction and lattice density; create, repair and clean up CAD geometry; simulate the additive process; and conduct structural and thermal analysis for data validation. In fluids, ANSYS 19.1 offered a new approach to cavitation modeling across diverse applications, from hydro pumps to rocket fuel systems. Users reliably predict cavitation using pre-existing material properties, without the need for empirical model parameters or extensive physical testing. ANSYS 19.1 introduced ANSYS EnVision™ Pro, a new version of ANSYS EnSight™ Viewer, which empowers engineers to interact with EnSight data and create new views

and photorealistic images. In semiconductors, a new 3D IC graphical user interface wizard enabled automatic and seamless connections between multiple dies, interposer and package for chip-level power and thermal integrity analysis, significantly improving usability and easing 3D IC setup and analysis.

Table of Contents

New Product Offerings

Optical

On May 2, 2018, the Company acquired OPTIS, a premier provider of software for scientific simulation of light, human vision and physics-based visualization. Adding OPTIS' optical sensor and closed-loop, real-time simulation to the Company's leading multiphysics portfolio, the Company now offers the broadest toolset for validating the safety and reliability of autonomous vehicles.

The Company's capabilities now span the simulation of all sensors, including lidar, cameras and radar; the multiphysics simulation of physical and electronic components; the analysis of systems functional safety; as well as the automated development of safety-certified embedded software. This functionality can be integrated into a closed-loop simulation environment that interacts with weather and traffic simulators, enabling thousands of driving scenarios to be executed virtually.

Beyond the autonomous vehicle sector, the acquisition reinforces the Company as a world-class simulation provider across various industries and verticals.

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 9001:2015 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 its own direct sales offices, as well as a global network of independent channel partners. 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 help mitigate geography-specific economic trends and provides the Company with an opportunity to take advantage of new geographic markets or enhance its sales coverage in existing markets. The Company derived 22.4%, 24.8% and 24.4% of its total revenue through the indirect sales channel for the years ended December 31, 2018, 2017 and 2016, 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 2018, the Company continued to invest in its existing domestic and international strategic sales offices. In total, the Company's direct sales organization comprises 1,700 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 2018, 2017 or 2016.

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

Table of Contents

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.

In 2018, the Company partnered with PTC to accelerate product innovation by providing customers a world-class simulation-driven design solution. Working together, ANSYS and PTC will deliver ANSYS Discovery Live real-time simulation within PTC's Creo® 3D CAD software. The combined solution will be sold by PTC as part of the Creo product suite. This solution will offer customers a unified modeling and simulation environment, removing the boundaries between CAD and simulation and enabling design engineers to gain insight into each of the many design decisions they make throughout the product development process. This insight will enable design engineers to create higher quality products, while reducing product and development costs. The product is expected to be commercially available in the first half of 2019.

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 3D 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. 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 Nimbix, Rescale and Gompute 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. In 2018, the Company entered into an agreement with SAP to embed ANSYS' pervasive simulation solutions for digital twins into SAP's market-leading digital supply chain, manufacturing and asset management portfolio. The partnership's first solution, expected in 2019, will run on SAP Cloud Platform and empower industrial asset operators to optimize operations and maintenance through real-time engineering insights, to reduce product cycle times and increase profitability.

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® 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® combined product.

The Company has a license agreement with Dynardo GmbH involving the optiSLang software for robust design optimization. Under this arrangement, Dynardo provides its optiSLang software and assists with marketing, customer

support, training, and integration into the Company's platform, in return for royalties from sales of the combined product. ANSYS optiSLang applies across many industries, extending and strengthening the Company's capabilities in sensitivity analysis and simulation process automation to enable faster and better-performing product designs.

Table of Contents

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. The Company's competitors include large, global, publicly traded companies; small, geographically-focused firms; startup firms; and solutions produced in-house by the end users. 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 (i.e. online agreements where the website provider posts terms and conditions, and the user clicks on the "accept" button). 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.

Table of Contents

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. The deferred revenue on the Company's consolidated balance sheets does not represent the total value of annual or multi-year, noncancellable 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, 2018 and 2017 consisted of the following:

ASC 606[1]	Balance at December 31, 2018		
(in thousands)	Total	Current	Long-Term
Deferred revenue	$343,174	$328,584	$ 14,590
Backlog	315,998	147,299	168,699
Total	$659,172		