

**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 June 30, 2019

or

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

For the transition period from to

Commission file number: 001-34630

Aspen Technology, Inc.

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

04-2739697
(I.R.S. Employer
Identification No.)

20 Crosby Drive
Bedford
Massachusetts
(Address of principal executive offices)

01730
(Zip Code)

Registrant's telephone number, including area code: **781-221-6400**

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

Title of Each Class	Trading Symbol	Name of Each Exchange on Which Registered
Common stock, \$0.10 par value per share	AZPN	NASDAQ Global Select Market

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

None

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 Section 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 checkmark 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 and post such files). Yes No

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	<input checked="" type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer (Do not check if a smaller reporting company)		Smaller reporting company	<input type="checkbox"/>
		Emerging growth company	<input type="checkbox"/>

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

As of December 31, 2018, the aggregate market value of common stock (the only outstanding class of common equity of the registrant) held by non-affiliates of the registrant was \$5,131,947,302 based on a total of 62,447,643 shares of common stock held by non-affiliates and on a closing price of \$82.18 on December 31, 2018 for the common stock as reported on The NASDAQ Global Select Market.

There were 68,367,624 shares of common stock outstanding as of August 30, 2019.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Proxy Statement related to its 2019 Annual Meeting of Stockholders to be filed with the Securities and Exchange Commission pursuant to Regulation 14A not later than 120 days after the end of the fiscal year covered by this Form 10-K are incorporated by reference in Part III, Items 10-14 of this Form 10-K.

EXPLANATORY NOTE

Overview

In this Form 10-K for the fiscal year ended June 30, 2019, we are including unaudited restated financial statements and other information for the quarterly periods ended September 30, 2018, December 31, 2018 and March 31, 2019, (the "Restated Quarters"). As a result, this filing includes more information than would normally be included in an Annual Report on Form 10-K in order to provide a composite presentation of information for the Restated Quarters.

We have not filed and do not intend to file amendments to any of our previously filed Quarterly Reports on Form 10-Q for the Restated Quarters. Accordingly, with respect to each of the Restated Quarters, investors and others should rely on the financial information and other disclosures contained in this Form 10-K, or in our future filings with the Securities and Exchange Commission and not on any previously issued or filed reports, earnings releases or similar communications relating to the Restated Quarters.

Quarterly Period Restatement

In completing our procedures to finalize our financial statements for the fiscal year ended June 30, 2019, we identified errors affecting the transition adjustment through the recording of revenue and related contract balances upon the adoption of Accounting Standard Update No. 2014-09, *Revenue from Contracts with Customers*, or ASC 606, and the classification of contract cost assets and related deferred tax assets and liabilities on our balance sheet. In connection with the review of the matters described above, on September 5, 2019, management (a) concluded that our previously issued financial statements and other financial data for the Restated Quarters should be restated and should no longer be relied upon for the reasons described below and (b) determined that our disclosures related to those financial statements and related communications issued by or on behalf of us with respect to the Restated Quarters should no longer be relied upon.

During the course of our review, we concluded that our financial statements for the Restated Quarters were not prepared in accordance with generally accepted accounting principles and required adjustments that decreased total contract assets by \$87.6 million, decreased net deferred income taxes by \$19.4 million, and decreased retained earnings by \$68.3 million as of June 30, 2018, and decreased total contract assets by \$84.0 million, decreased net deferred income taxes by \$19.4 million, decreased accounts receivable by \$3.7 million, and decreased retained earnings by \$68.3 million as of September 30, 2018, December 31, 2018 and March 31, 2019. Further information regarding the adjustments is provided in Note 19, "Quarterly Financial Data (Unaudited)," to our audited financial statements.

Management also concluded that our lack of adequate internal control over financial reporting relating to these matters for the Restated Quarters constituted the material weakness in internal control over financial reporting described below.

Material Weakness and Remediation Measures

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting such that there is a reasonable possibility that a material misstatement of annual or interim financial statements will not be prevented or detected on a timely basis. Based on an assessment under the criteria set forth in *Internal Control-Integrated Framework (2013)*, management concluded that our internal control over financial reporting was not effective as of June 30, 2019, due to the material weakness in our internal control over financial reporting discussed below.

We did not effectively design process level control activities over the accuracy of the retrospective restatement of revenue and related contract balances recorded upon the adoption of ASC Topic 606, and the classification of contract cost assets and related deferred tax assets and liabilities on the consolidated balance sheet. The control deficiencies identified resulted from an ineffective risk assessment and the lack of timely creation of relevant reporting tools and information used to support the functioning of internal control. These deficiencies created a reasonable possibility that a material misstatement would not have been prevented or detected on a timely basis and accordingly management concluded that the deficiencies represented a material weakness in our internal control over financial reporting.

Since identifying the errors made in the transition adjustment related to ASC 606, we have been, and continue to be, actively engaged in the design and implementation of remediation measures to address the material weakness in our internal control over financial reporting, as described under "Remediation" in "Item 9A. Controls and Procedures" of this Form 10-K. We believe these actions will strengthen our internal control over financial reporting and will remediate the material weakness by the end of fiscal 2020.

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Our registered trademarks include aspenONE and Aspen Plus. All other trademarks, trade names and service marks appearing in this Form 10-K are the property of their respective owners.

Our fiscal year ends on June 30, and references to a specific fiscal year are the twelve months ended June 30 of such year (for example, "fiscal 2019" refers to the year ended June 30, 2019).

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS AND INDUSTRY DATA

This 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. Forward-looking statements relate to future events or our future financial performance. We generally identify forward-looking statements by terminology such as "anticipate," "believe," "could," "estimate," "expect," "intend," "may," "potential," "should," "target," or the negative of these terms or other similar words. These statements are only predictions. The outcome of the events described in these forward-looking statements is subject to known and unknown risks, uncertainties and other factors that may cause our, our customers' or our industry's actual results, levels of activity, performance or achievements expressed or implied by these forward-looking statements, to differ. "Item 1. Business," "Item 1A. Risk Factors" and "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations" as well as other sections in this Form 10-K, discuss some of the factors that could contribute to these differences. The forward-looking statements made in this Form 10-K relate only to events as of the date on which the statements are made. We undertake no obligation to update any forward-looking statement to reflect events or circumstances after the date on which the statement is made or to reflect the occurrence of unanticipated events. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments we may make. The industry in which we operate is subject to a high degree of uncertainty and risk due to variety of factors, including those described in "Item 1A. Risk Factors." Unless the context indicates otherwise, references in this report to "we", "us", "our" and other similar references mean Aspen Technology, Inc. and its subsidiaries.

PART I

Item 1. Business.

Overview

We are a leading global supplier of asset optimization solutions that optimize asset design, operations and maintenance in complex, industrial environments. We combine decades of process modeling and operations expertise with big data machine-learning and analytics. Our purpose-built software solutions improve the competitiveness and profitability of our customers by increasing throughput, energy efficiency, and production, reducing unplanned downtime, enhancing capital efficiency, and decreasing working capital requirements over the entire asset lifecycle to support operational excellence.

Our software incorporates our proprietary mathematical and empirical models of manufacturing and planning processes and reflects the deep domain expertise we have amassed from focusing on solutions for the process and other capital-intensive industries for over 35 years. We have developed our applications to design and optimize processes across three principal business areas: engineering, manufacturing and supply chain, and asset performance management. We are a recognized market and technology leader in providing process optimization and asset performance management software solutions for each of these business areas.

We have established sustainable competitive advantages based on the following strengths:

- Innovative products that can enhance our customers' profitability and productivity;
- Long-term customer relationships;
- Large installed base of users of our software; and
- Long-term license contracts.

We have approximately 2,300 customers globally. Our customers consist of companies engaged in the process and other capital-intensive industries such as energy, chemicals, engineering and construction, as well as pharmaceuticals, transportation, power, metals and mining, pulp and paper, and consumer packaged goods.

Industry Background

The process manufacturing industries consist of companies that typically manufacture finished products by applying a controlled chemical process either to a raw material that is fed continuously through the plant or to a specific batch of raw material.

Process industry characteristics and dynamics are complex; therefore, any small improvement in the high-volume feedstocks used, or to the chemical process applied, can have a significant impact on the efficiency and cost-effectiveness of manufacturing operations. As a result, process manufacturers, as well as the engineering and construction firms that partner with these manufacturers, have extensive technical requirements and need sophisticated, integrated software to help design,

operate and maintain complex manufacturing assets. The unique characteristics associated with process manufacturing create special demands for business applications that frequently exceed the capabilities of generic or non-process manufacturing software packages.

Industry Specific Challenges Facing the Process Industries

Companies in different segments of the process industries face specific challenges that drive the need for software solutions that design, operate and maintain manufacturing environments more effectively:

Energy. Our energy markets are comprised of three primary sectors: Exploration and Production, also called "upstream," Oil and Gas Production and Processing, also called "midstream," and Refining and Marketing, also called "downstream":

- Companies engaged in Exploration and Production explore for and produce hydrocarbons. They target reserves in increasingly diverse geographies involving geological, logistical and political challenges. They need to design and develop ever larger, more complex and more remote production, gathering and processing facilities as quickly as possible with the objective of optimizing production and ensuring regulatory compliance.
- Companies engaged in Oil and Gas Production and Processing produce and gather oil and natural gas from well heads, clean it, process it, and separate it into oil, dry natural gas, and natural gas liquids in preparation for transport to downstream markets. The number of oil and gas processing plants in North America has increased significantly in recent years to process the oil and gas extracted from shale deposits.
- Companies engaged in Refining and Marketing convert crude oil through a thermal and chemical manufacturing process into end products such as gasoline, jet and diesel fuels and into intermediate products for downstream chemical manufacturing companies. These companies are characterized by high volumes and low operating margins. In order to deliver better margins, they focus on optimizing feedstock selection and product mix, reducing energy and capital costs, maximizing throughput, and minimizing inventory, all while operating safely and in accordance with regulations.

Chemicals. The chemicals industry includes both bulk and specialty chemical companies:

- Bulk chemical producers manufacture commodity chemicals and compete primarily on price; they seek to achieve economies of scale and manage operating margin pressure by building larger, more complex plants located near feedstock sources.
- Specialty chemical manufacturers, which primarily manufacture highly differentiated customer-specific products, face challenges in managing diverse product lines, multiple plants, complex supply chains and product quality.

Engineering and construction. Engineering and construction firms that work with process manufacturers compete on a global basis by bidding on and executing on complex, large-scale projects. They need a digital environment in which optimal plant designs can be produced quickly and efficiently, incorporating highly accurate modeling, analysis and cost estimation technology. In addition, these projects require software that enables significant collaboration internally, with the manufacturer, and in many cases, with other engineering and construction firms.

Companies in the metals and mining, consumer packaged goods, power, pulp and paper, pharmaceuticals and biofuels industries are also seeking asset optimization solutions that help them deliver improved financial and operating results in the face of varied process manufacturing challenges.

Complexity of the Process Industries

Companies in the process industries constantly face pressure on margins causing them to continually seek ways to operate more efficiently. At the same time, these manufacturers face complexity as a result of the following:

Globalization of markets. Process manufacturers are continuously expanding their operations to take advantage of growing demand and more economically viable sources of feedstocks. Process manufacturers must be able to design, build and operate plants efficiently and economically while managing and optimizing ever broadening supply chains.

Market volatility. Process manufacturers must react quickly to frequent changes in feedstock prices, temporary or longer-term feedstock shortages, and rapid changes in finished product prices. Unpredictable commodity markets strain the manufacturing and supply chain operations of process manufacturers, which must evaluate and implement changes in inventory levels, feedstock inputs, equipment usage and operational processes to remain competitive.

Environmental and safety regulations. Process companies must comply with an expanding array of data maintenance and reporting requirements under governmental and regulatory mandates, and the global nature of their operations can subject them to numerous regulatory regimes. These companies are increasingly relying upon software applications to model potential outcomes, store operating data and develop reporting capabilities in response to heightened scrutiny and oversight because of environmental, safety and other implications of their products and manufacturing processes.

Evolving Workforce. Process companies must adapt to the changing nature of the technical workforce. A generation of highly experienced plant operators and engineers is nearing retirement.

Market Opportunity

Technology solutions play a major role in helping companies in the process industries improve their manufacturing productivity. In the 1980s, process manufacturers implemented distributed control systems, or DCS, to automate the management of plant hardware. DCS use computer hardware, communication networks and industrial instruments to measure, record and automatically control process variables. In the 1990s, these manufacturers adopted enterprise resource planning, or ERP, systems to streamline back office functions and interact with DCS. These systems allowed process manufacturers to track, monitor and report the performance of each plant, rather than rely on traditional paper and generic desktop spreadsheets.

Many process manufacturers have implemented both DCS and ERP systems but have realized that their investments in hardware and back-office systems are inadequate. DCS are only able to control and monitor processes based on fixed sets of parameters and cannot dynamically react to changes in the manufacturing process unless instructed by end users. ERP systems can only record what is produced in operations. Although DCS and ERP systems help manage manufacturing performance, neither of these systems can optimize what is produced, how it is produced or where it is produced. Moreover, neither can help a process manufacturer understand how to improve its processes or how to identify opportunities to decrease operating expenses.

Asset optimization software focuses on the optimum design, operation, and maintenance of the manufacturing process; how the design is optimized for operations and reliability, how the process is operated for optimal economic performance, and how the design and operations impact the longevity and reliability of the equipment. By connecting DCS and ERP systems with intelligent, dynamic applications, asset optimization software allows a manufacturer to make better, faster economic decisions. Examples of how asset optimization software can optimize a manufacturing environment include incorporating process manufacturing domain knowledge, supporting real-time decision making, predicting equipment failure, and providing the ability to respond and adapt to operational changes. Furthermore, these solutions can optimize the supply chain by helping a manufacturer to understand the operating conditions in each plant, enabling more efficient and optimized production decisions.

Process manufacturers employ highly skilled technical personnel specializing in areas such as process design, equipment design, control engineering, manufacturing operations, analytics, planning, scheduling, and supply chain management. To drive efficiency and improve operating margins, these personnel need to collaborate across functional areas and increasingly rely on software to enable this collaboration as well as automate complex tasks associated with their jobs. Process companies must adapt to the changing nature of the technical workforce. A generation of highly experienced plant operators and engineers is nearing retirement. As a result, we believe there is increasing demand for intelligent software applications that capture and automate expert knowledge and are intuitive and easy-to-learn.

aspenONE Solutions

We provide integrated asset optimization software solutions designed and developed specifically for the process and other capital-intensive industries. Customers use our solutions to improve their competitiveness and profitability by increasing throughput and productivity, reducing operating and maintenance costs, increasing reliability, enhancing capital efficiency, enabling collaboration among different functions and decreasing working capital requirements. Our aspenONE solutions are organized into three suites: 1) engineering; 2) manufacturing and supply chain; and 3) asset performance management (APM):

Engineering. Our engineering software is used to develop process designs of new plants, re-vamp existing plants, and simulate and optimize existing processes.

Manufacturing and Supply Chain. Our manufacturing software is used to optimize day-to-day processing activities, enabling process manufacturers to make better, more profitable decisions and to improve plant performance. Our supply chain management software is designed to enable process manufacturers to reduce inventory levels, increase asset efficiency, respond rapidly to market demands and optimize supply chain operations.

Asset Performance Management. Our asset performance management software is used to understand and predict the reliability of a system; be it multiple assets, a single asset, or equipment in a plant. The factors that impact reliability include how operating conditions degrade equipment performance over time, or how process conditions lead to equipment

failure, and the ability to predict when the equipment will fail and prescribe actions to avoid such occurrences. The APM suite is a comprehensive suite of machine learning and analytics technologies which, when used in a standalone or integrated manner with historical and real time asset and equipment data, can help our customers improve their return on capital employed.

Our aspenONE licensing model is a subscription offering under which customers receive access to all the products within the aspenONE suite(s) they license, including the right to any new unspecified future software products and updates that may be introduced into the licensed aspenONE software suite. This affords customers the ability to use our software whenever required and to experiment with different applications to best solve whatever critical business challenges they face.

We offer customer support, professional services and training services to our customers. Under our aspenONE licensing model, software maintenance and support is included for the term of the arrangement. Professional services are offered to customers as a means to further implement and extend our technology across their corporations.

The key benefits of our aspenONE solutions include:

Broad and comprehensive software suites. We believe we are the only software provider that has developed comprehensive suites of software applications addressing the engineering, manufacturing and supply chain and maintenance requirements of process manufacturers. While some competitors offer solutions in one or two principal business areas, no other vendor can match the breadth of our aspenONE offerings. In addition, we have developed an extensive array of software applications that address extremely specific and complex industry and end user challenges, such as feedstock selection and production scheduling for petroleum companies.

Integrated software solutions. aspenONE provides a standards-based framework that integrates applications, data and models within each of our software suites. Process manufacturers seeking to improve their business operations can use the integrated software applications in the aspenONE Manufacturing and Supply Chain suite to support real-time decision making both for individual production facilities and across multiple sites.

Flexible commercial model. Our aspenONE licensing model provides a customer with access to all of the applications within and across the aspenONE suite(s) the customer licenses, including the right to any new unspecified future software products and updates that may be introduced into the licensed aspenONE software suite. The customer can change or alternate the use of multiple applications in a licensed suite through the use of exchangeable units of measurement, or tokens, licensed in quantities determined by the customer. This enables the customer to use those applications whenever required and to experiment with different applications to best solve whatever critical business challenges the customer faces. The customer can easily increase its usage of our software as their business requirements evolve.

Our Competitive Strengths

In addition to the breadth and depth of our integrated aspenONE software and the flexibility of our aspenONE licensing model, we believe our key competitive advantages include the following:

Industry-leading innovation based on substantial process expertise. For over 35 years, our significant investment in research and development has led to a number of major process engineering advances considered to be industry-standard applications. Our development organization is comprised of software engineers, chemical engineers and data scientists. This combination of expertise has been essential to the development of leading products embedded with chemical engineering principles, optimization and machine learning algorithms, analytics, and the process industries' workflows and best practices.

Rapid, high return on investment. Many customers purchase our software because they believe it will provide rapid, demonstrable and significant returns on their investment and increase their profitability. For some customers, economic benefits in the first year following installation have exceeded the total cost of our software. For many customers, even a relatively small improvement in performance can generate substantial recurring benefits due to the large production volumes and limited profit margins typical in process industries. In addition, our solutions can generate organizational efficiencies and operational improvements that can further increase a process company's profitability.

Growth Strategy

We seek to maintain and extend our position as a leading global provider of process optimization software and related services to the process industries. We have introduced a new strategy to evolve our scope of optimization from the process units in a plant to the process and the equipment in the plant or entire asset. We plan to expand our reach in optimization from conceptualization and design, operations, and supply chain to the maintenance aspects of the plant. We plan to build on our expertise in process optimization, our installed base, and long term customer relationships to expand our reach in the maintenance area of the plant. By focusing on asset optimization, we will be able to optimize the design and operations of a plant considering the performance and constraints of process equipment so as to optimize the full asset lifecycle. Our primary growth strategy is to expand organically within our core verticals by leveraging our market leadership position and driving

increased usage and product adoption of the broad capabilities in our aspenONE offerings. Additionally, we seek acquisitions to accelerate our overall growth in the design and operations of the process, and acquisitions that will expand our maintenance solution to deliver asset optimization. To accomplish these goals, we will pursue the following activities:

Continue to provide innovative, market-leading solutions. Our recent innovations include multi-unit dynamic process optimization, adaptive process control, modeling of solids and batch processes, rundown blending optimization, crude assay characterization and refinery reactor modeling using molecular science, electrolyte and biofuel characterizations, process safety, sulfur recovery, methodologies for carbon management, multivariate analysis, process reliability, and equipment and process analytics. Most recently we introduced integrated steady state and batch process modeling capabilities for specialty chemical and pharmaceutical processes and a solution for operator training, as well as solutions for Industrial IoT Edge and enterprise data collection. We intend to continue to invest in research and development in order to develop and offer new and enhanced solutions for our aspenONE suites. We have pioneered a number of industry standard and award-winning software applications. For example, Aspen Plus, our process modeling tool for the chemicals industry, has won the *Chemical Processing* magazine Readers' Choice Award for "Process Simulation Software" multiple times. We have also been recognized by *R&D Magazine* for innovation in out of the box modeling capabilities that we developed with the National Institute of Standards and Technology.

Further penetrate existing customer base. We have an installed base of approximately 2,300 customers. Many of our customers only use a fraction of our products. We work with our customers to identify ways in which they can improve their business performance by using the entire licensed suite of aspenONE solutions, both at an individual user level and across all of their plant locations. Our customers are segmented based on their size and complexity. Our large complex customers are serviced by our Field Sales organization, while our other customers are serviced by our inside sales group. Additionally, we regularly enhance our products to make them easier to use and seek to increase productivity of users by offering more integrated workflows.

Adoption and usage in customer base. We strive for our customers to adopt and sustain the use of our products by maximizing the consumption of their token entitlement. We do so by focusing our go-to-market resources through specific customer success management activities that generate and sustain the value from our products by ensuring that customers are using the latest version of our products, that our software is deployed in the most optimal manner in their IT networks, and that our customers are familiar with the latest value enhancing functionality in our products.

Asset Performance Management expansion. In fiscal year 2017, we introduced a new suite of products focused on improving the reliability of our customers' assets and equipment using a combination of machine learning, data science and process modeling together with historical and real time asset and equipment data. We have increased our investment in the research and development, sales and marketing, and channel sales functions to build out the capabilities that will enable us to grow this new business area and deliver value for our customers. In addition, we target additional capital-intensive industries with the APM functionality that we refer to as the global economy industries. These include metals and mining, power, pulp and paper, pharmaceutical, and food and beverage.

Build an ecosystem. The relevance of our solutions in the markets we serve means that we have the opportunity to leverage third parties interested in building or expanding their businesses to increase our market penetration. The breadth of relationships that we establish will depend on the profile of the third-party company and the objectives specified to be achieved from the promotion and implementation of our products and solutions.

Pursue acquisitions. As part of our make-vs-buy analyses, we regularly explore and evaluate acquisitions. We have made several acquisitions in recent years and believe the opportunity exists to do more, especially as we seek to evolve our strategy to asset optimization and the maintenance area of the plant.

Expand our total addressable market. Our focus on innovation also means introducing product capabilities or new product categories that create value for our customers and therefore expand our total addressable market.

Products

Our integrated asset optimization software solutions are designed and developed specifically for the process industries. Customers use our solutions to improve their competitiveness and profitability by increasing throughput and productivity, reducing operating costs, enhancing capital efficiency, and decreasing working capital requirements. We have designed and developed our software applications across four principal business areas:

Engineering. Our engineering software applications are used during both the design and the ongoing operation of plant facilities to model and improve the way engineers develop and deploy manufacturing assets. Process manufacturers must address a variety of challenges including design, operational improvement, collaborative engineering and economic evaluation.

They must, for example, determine where they should locate facilities, how they can lower capital and manufacturing costs, what they should produce and how they can maximize plant efficiency.

Manufacturing. Our manufacturing software products focus on optimizing day-to-day processing activities, enabling customers to make better, faster decisions that lead to improved plant performance and operating results. These solutions include desktop and server applications that help customers make real-time decisions, which can reduce fixed and variable costs and improve product yields. Process manufacturers must address a wide range of manufacturing challenges such as optimizing execution efficiency, reducing costs, selecting the right raw materials, scheduling and coordinating production processes, and identifying an appropriate balance between turnaround times, delivery schedules, product quality, cost and inventory.

Supply Chain Management. Our supply chain management solutions include desktop and server applications that help customers optimize critical supply chain decisions in order to reduce inventory, increase asset efficiency, and respond more quickly to changing market conditions. Process manufacturers must address numerous challenges as they strive to manage raw materials inventory, production schedules and feedstock purchasing decisions effectively and efficiently. Supply chain managers face these challenges in an environment of ever-changing market prices, supply constraints and customer demands.

Asset Performance Management. Our asset performance management products are used to understand and predict the reliability of a system; be it multiple assets, a single asset, or equipment in a plant. Factors that impact reliability include how operating conditions degrade equipment performance over time, or how process conditions can lead to equipment failure. The APM suite is a comprehensive suite of machine learning and analytics technologies which can be used in a standalone or integrated manner with historical and real time asset and equipment data to help our customers predict when the equipment will fail and prescribe actions to avoid such occurrences, thereby improving return on capital employed.

Our software applications are currently offered in three suites: aspenONE Engineering, aspenONE Manufacturing and Supply Chain, and aspenONE Asset Performance Management. These suites are integrated applications that allow end users to design process manufacturing environments, monitor operational performance, respond and adapt to operational changes, predict asset reliability and equipment failure, and manage planning and scheduling activities as well as collaborate across these functions and activities. The three suites are designed around core modules and applications that allow customers to design, operate and maintain their process manufacturing environments, as shown below:

aspenONE Engineering

Business Area	aspenONE Module	Major Products	Product Description
Engineering	Process Simulation for Energy	Aspen HYSYS	Process modeling software for the design and optimization of hydrocarbon processes, including flow assurance, refinery reactors, acid gas clean-up, and sulfur recovery
		Aspen Operator Training	Solution for developing and deploying dynamic plant simulations for the purpose of training plant operators to respond to operational and safety scenarios in a virtual training environment
	Process Simulation for Chemicals	Aspen Plus	Process modeling software for the design and optimization of chemical processes, including solids and batch processes
	Economic Evaluation	Aspen Economic Evaluation	Economic evaluation software for estimating project capital costs and lifecycle asset economics - from conceptual definition through detailed cost estimation
	Equipment Design & Rating	Aspen Exchanger Design and Rating	Software for the design, simulation and rating of various types of heat exchangers
	Basic Engineering	Aspen Basic Engineering	Collaborative platform for managing process engineering data and producing front-end design deliverables such as multi-disciplinary datasheets, process flow diagrams, piping and instrument diagrams, and equipment lists
	Operation Support	Aspen Online	Solution that connects process models to real-time plant data for expedited decisions, operational guidance, and optimization

aspenONE Manufacturing and Supply Chain

Business Area	aspenONE Module	Major Products	Product Description
Manufacturing	Advanced Process Control	Aspen DMC3	Multi-variable controller software for maintaining processes at their optimal operating point under changing process conditions
		Aspen Watch Performance Monitor	Real-time monitoring and diagnostic information software to help engineers and operators focus on the problems that erode margins
	Dynamic Optimization	Aspen GDOT	Multi-unit dynamic optimization software for alignment of Advanced Process Control (APC) with Planning & Scheduling to enable unified production optimization for refineries and ethylene plants
	Manufacturing Execution Systems	Aspen Info Plus.21	Data historian software for storing, visualizing and analyzing large volumes of data to improve production execution and enhance performance management
		AspenONE Process Explorer	Software for combining process measurements, product characteristics, alarms, events and unstructured data for a complete view of production
Aspen Production Record Manager		Easy and fast segmentation of production data into batches, campaigns or other logical groupings for easier analysis and production reporting	
Supply Chain	Refinery Planning & Scheduling	Aspen Production Execution Manager	Workflow, order and recipe management software per cGMP guidelines that ensures operational consistency for improved yields, higher quality and lower production costs
		Aspen PIMS Advanced Optimization	Refinery planning software for optimizing feedstock selection, product slate and operational execution
		Aspen Petroleum Scheduler	Refinery scheduling software for scheduling and optimization of refinery operations with integration to refinery planning, blending and dock operations
		Supply & Distribution	Aspen Petroleum Supply Chain Planner
	Aspen Fleet Optimizer		Software for inventory management and truck transportation optimization in secondary petroleum distribution
	Supply Chain Management	Aspen Collaborative Demand Manager	Software for forecasting market demand and managing forecast through changes in the business environment by combining historical and real time data
		Aspen Plant Scheduler	Software for generating optimal production schedules to meet total demand
		Aspen Supply Planner	Software for determining the optimal production plan taking into account labor and equipment, feedstock, inbound /outbound transportation, storage capacity, and other variables

aspenONE Asset Performance Management

Business Area	aspenONE Module	Major Products	Product Description
Asset Performance Management	Risk Analysis	Aspen Fidelis Reliability	Software for predicting the future performance of any system and quantifying the change in performance due to changes in design, capacity, operations, maintenance, logistics, market dynamics, and weather
	Process Analytics	Aspen ProMV	Multivariate analysis software for analyzing interrelated process data for continuous and batch processes, to identify the minimum critical set of variables driving product quality and process performance, and identifying optimal set points
		Aspen Asset Analytics	Software for analyzing plant operations in real time to identify causal precursors that can lead to an unplanned downtime event
	Equipment Analytics	Aspen Mtell	Software for recognizing unique data patterns as predictions of future equipment behavior
	Connect	Aspen Edge Connect	Software to collect data from assets, enterprise data sources, and MES systems using Industrial IoT technology, and integrating the data into enterprise systems on-premise or in the cloud
Aspen Cloud Connect			

Our product development activities are currently focused on strengthening the integration of our applications and adding new capabilities that address specific operational business processes in each industry. As of June 30, 2019, we had a total of 568 employees in our research and development group, which is comprised of product management, software development and quality assurance. Research and development expenses were \$83.1 million in fiscal 2019, \$82.1 million in fiscal 2018 and \$79.5 million in fiscal 2017.

Sales and Marketing

We employ a value-based sales approach, offering our customers a comprehensive suite of software and services that enhance the efficiency and productivity of their engineering, manufacturing and supply chain and maintenance operations. We have increasingly focused on positioning our products as a strategic investment and therefore devote an increasing portion of our sales efforts to our customers' senior management, including senior decision makers in manufacturing, operations, maintenance and technology. Our aspenONE solution strategy supports this value-based approach by broadening the scope of optimization across the entire enterprise over its lifecycle, expanding the use of process models in the operations environment, and enabling the use of analytics and data science to enhance equipment and process reliability. We offer a variety of training programs focused on illustrating the capabilities of our applications as well as online training built into our applications. We have implemented incentive compensation programs for our sales force to reward efforts that increase customer usage of our products. Furthermore, we believe our aspenONE licensing model enables our sales force to develop consultative sales relationships with our customers.

Historically, most of our license sales have been generated through our direct Field Sales organization. In order to market the specific functionality and other technical features of our software, our account managers work with specialized teams of technical sales personnel and product specialists organized for each sales and marketing effort. Our technical sales personnel typically have degrees in chemical engineering or related disciplines and actively consult with a customer's plant engineers. Product specialists share their detailed knowledge of the specific features of our software solutions as they apply to the unique business processes of different vertical industries. In addition to our direct Field Sales organization, we employ an inside sales team that targets customers in certain market segments.

We have established channel relationships with select companies that we believe can help us pursue opportunities in non-core target markets. We also license our software products to universities that agree to use our products in teaching and research. We believe that students' familiarity with our products will stimulate future demand once the students enter the workplace.

We supplement our sales efforts with a variety of marketing initiatives, including industry analyst and public relations activities, campaigns to promote product usage and adoption, user group meetings and customer relationship programs. Our broad user base spans multiple verticals and geographies and these users possess a variety of skills, experience and business needs. In order to reach each of them in an effective, productive and leveraged manner we will increasingly capitalize on digital customer engagement solutions. Using webinars, digital communities, social media, videos, email and other digital means, we

seek to engage our extensive user base with targeted messages intended to address the specific needs of each market, customer and user.

Our overall sales force, which consists of sales account managers, technical sales personnel, indirect-channel personnel, inside sales personnel, and marketing personnel, consisted of 474 employees as of June 30, 2019.

Software Maintenance and Support, Professional Services and Training

Software maintenance and support (“SMS”) consists primarily of providing customer technical support and access to software fixes and upgrades. Customer technical support services are provided throughout the world by our three global call centers as well as via email and through our support website. For license term arrangements entered into subsequent to our transition to a subscription-based licensing model, SMS is included with the license arrangement. For license arrangements that do not include SMS, customers can purchase standalone SMS.

We offer professional services focused on implementation of our solutions. Our professional services team primarily consists of project engineers with degrees in chemical engineering or a similar discipline, or who have significant relevant industry experience. Our employees include experts in fields such as thermophysical properties, distillation, adsorption processes, polymer processes, industrial reactor modeling, the identification of empirical models for process control or analysis, large-scale optimization, supply distribution systems modeling and scheduling methods. Our primary focus is the successful implementation and usage of our software, and in many instances, this work can be professionally performed by qualified third parties. As a result, we often compete with third-party consulting firms when bidding for professional services contracts, particularly in developed markets. We offer our services on either a time-and-material or fixed-price basis.

We offer a variety of training solutions ranging from standardized training, which can be delivered in a public forum, on-site at a customer's location or over the Internet, to customized training sessions, which can be tailored to fit customer needs. We have also introduced a wide range of online computer-based training courses offering customers on-demand training in basic and advanced features of our products directly from within the products. As of June 30, 2019, we had a total of 296 employees in our customer support, professional services and training groups.

Business Segments

We have two operating and reportable segments, which are consistent with our reporting units: i) subscription and software and ii) services and other. The subscription and software segment is engaged in the licensing of process optimization and asset performance management software solutions and associated support services, and includes our license and maintenance revenue. The services and other segment includes professional services and training, and includes our services and other revenue.

Competition

Our markets in general are competitive, and we expect the intensity of competition in our markets to increase as existing competitors enhance and expand their product and service offerings and as new participants enter the market. Increased competition may result in price reductions, reduced profitability and loss of market share. We cannot ensure that we will be able to compete successfully against existing or future competitors. Some of our customers and companies with which we have strategic relationships also are, or may become, competitors.

Many of our current and potential competitors have greater financial, technical, marketing, service and other resources than we have. As a result, these companies may be able to offer lower prices, additional products or services, or other incentives that we cannot match or offer. These competitors may be in a stronger position to respond more quickly to new technologies and may be able to undertake more extensive marketing campaigns. We believe they also have adopted and may continue to pursue more aggressive pricing policies and make more attractive offers to potential customers, employees and strategic partners. For example, some competitors may be able to initiate relationships through sales and installations of hardware and then seek to expand their customer relationships by offering asset optimization software at a discount. In addition, competitors with greater financial resources may make strategic acquisitions to increase their ability to gain market share or improve the quality or marketability of their products. Furthermore, we face challenges in selling our solutions to large companies in the process industries that have internally developed their own proprietary software solutions.

We seek to develop and offer integrated suites of targeted, high-value vertical industry solutions that can be implemented with relatively limited service requirements. We believe this approach provides us with an advantage over many of our competitors that offer software products that are point solutions or are more service-based. Our key competitive differentiators include:

- Breadth, depth and integration of our aspenONE software offering;

- Rapid return on investment and increase in profitability;
- Domain expertise of chemical engineering personnel;
- Focus on software for the process industries;
- Flexibility of our usage-based aspenONE licensing model; and
- Consistent global support.

Proprietary Rights

Our software is proprietary and fundamental to our business. To protect our proprietary technology and brand, and prevent unauthorized use of our software, we rely on a combination of copyright, patent, trademark and trade secret laws in the United States and other jurisdictions, license and confidentiality agreements, and technology. We generally seek to protect our trade secrets by entering into non-disclosure agreements with our employees and customers, and historically have restricted access to our software and source code, which we regard as proprietary information. We have obtained or applied for patent protection with respect to some of our intellectual property and have registered or applied to register some of our trademarks in the United States and in selected other countries. We actively monitor use of our intellectual property and have enforced, and will continue to enforce, our intellectual property rights. In the United States, we are generally able to maintain our patents for up to 20 years from the earliest effective filing date, and to maintain our trademark registrations for as long as the trademarks are in use.

The laws of many countries in which our products are licensed may not protect our intellectual property rights to the same extent as the laws of the United States. While we consider our intellectual property rights to be valuable, we do not believe that our competitive position in the industry depends solely on obtaining legal protection for our software products and technology. Instead, we believe that the success of our business also depends on our ability to maintain a leadership position by continuing to develop innovative software products and technology.

Our proprietary rights are subject to risks and uncertainties described under Item 1A. "Risk Factors" below. You should read that discussion, which is incorporated into this section by reference.

Licenses

In connection with our acquisition of Hyprotech Ltd. and related subsidiaries of AEA Technology plc in May 2002 and the consent decree we entered into with the Federal Trade Commission in December 2004 to resolve allegations that the acquisition was improperly anticompetitive, we and certain of our subsidiaries entered into a purchase and sale agreement with Honeywell International Inc. and certain of its subsidiaries, pursuant to which we sold intellectual property and other assets to Honeywell relating to our operator training business and our Hyprotech engineering software products. Under the terms of the transactions, we retained a perpetual, irrevocable, worldwide, royalty-free non-exclusive license to the Hyprotech engineering software and have the right to continue to develop, license and sell the Hyprotech engineering products.

In March 1982, we entered into a System License Agreement with the Massachusetts Institute of Technology, or MIT, granting us a worldwide, perpetual non-exclusive license (with the right to sublicense) to use, reproduce, distribute and create derivative works of the computer program known as "ASPEN" which provides a framework for simulating the steady-state behavior of chemical processes that we utilize in the simulation engine for our Aspen Plus product. MIT agreed that we would own any derivative works and enhancements. MIT has the right to terminate the agreement if: we breach it and do not cure the breach within 90 days after receiving a written notice from MIT; we cease to carry on our business; or certain bankruptcy or insolvency proceedings are commenced and not dismissed. In the event of such termination, sublicenses granted to our customers prior to termination will remain in effect.

Employees

As of June 30, 2019, we had a total of approximately 1,600 full-time employees, of whom 809 were located in the United States. None of our employees is represented by a labor union, except for one employee of our subsidiary Hyprotech UK Limited who belongs to the Prospect union for professionals. We have experienced no work stoppages and believe that our employee relations are satisfactory.

Corporate Information

Aspen Technology, Inc. was formed in Massachusetts in 1981 and reincorporated in Delaware in 1998. Our principal executive offices are at 20 Crosby Drive, Bedford, Massachusetts 01730, and our telephone number at that address is (781) 221-6400. Our website address is <http://www.aspentech.com>. The information on our website is not part of this Form 10-K, unless expressly noted.

Available Information

We file reports with the Securities and Exchange Commission, or the SEC, which we make available on our website free of charge. These reports include annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to such reports, each of which is provided on our website as soon as reasonably practicable after we electronically file such materials with or furnish them to the SEC. You can also read and copy any materials we file with the SEC at the SEC's Public Reference Room at 100 F Street, N.E., Washington, DC 20549. You can obtain additional information about the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. In addition, the SEC maintains a website (<http://www.sec.gov>) that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC, including us.

Item 1A. Risk Factors.

Investing in our common stock involves a high degree of risk. You should carefully consider the risks and uncertainties described below before purchasing our common stock. The risks and uncertainties described below are not the only ones facing our company. Additional risks and uncertainties may also impair our business operations. If any of the following risks actually occurs, our business, financial condition, results of operations or cash flows would likely suffer. In that case, the trading price of our common stock could fall, and you may lose all or part of your investment in our common stock.

Risks Related to Our Business

If we fail to increase usage and product adoption of our aspenONE engineering and manufacturing and supply chain offerings and grow our aspenONE APM business, or fail to continue to provide innovative, market-leading solutions, we may be unable to implement our growth strategy successfully, and our business could be seriously harmed.

The maintenance and extension of our market leadership and our future growth is largely dependent upon our ability to increase usage and product adoption of our aspenONE engineering and manufacturing and supply chain offerings and grow our aspenONE APM business, and to develop new software products that achieve market acceptance with acceptable operating margins. Enterprises are requiring their application software vendors to provide greater levels of functionality and broader product offerings. We must continue to enhance our current product line and develop and introduce new products and services that keep pace with increasingly sophisticated customer requirements and the technological developments of our competitors. Our business and operating results could suffer if we cannot successfully execute our strategy and drive usage and product adoption.

We have implemented a product strategy that unifies our software solutions under the aspenONE brand with differentiated aspenONE vertical solutions targeted at specific capital-intensive industries. We cannot ensure that our product strategy will result in products that will continue to meet market needs and achieve significant usage and product adoption. If we fail to increase usage and product adoption or fail to develop or acquire new software products that meet the demands of our customers or our target markets, our operating results and cash flows from operations will grow at a slower rate than we anticipate and our financial condition could suffer.

Our business could suffer if we do not grow our aspenONE APM business or if the demand for, or usage of, our other aspenONE software declines for any reason, including declines due to adverse changes in the process and other capital-intensive industries.

We have introduced the aspenONE APM suite, and our aspenONE engineering and manufacturing and supply chain suites account for a significant majority of our revenue and will continue to do so for the foreseeable future. If we do not grow our aspenONE APM business or if demand for, or usage of, our other suites declines for any reason, our operating results, cash flows from operations and financial position would suffer. Our business could be adversely affected by:

- insufficient growth in our aspenONE APM business;
- any decline in demand for or usage of our aspenONE suites;
- the introduction of products and technologies that serve as a replacement or substitute for, or represent an improvement over, our aspenONE suites;
- technological innovations that our aspenONE suites do not address;
- our inability to release enhanced versions of our aspenONE suites on a timely basis; and

- adverse changes in capital intensive industries or otherwise that lead to reductions, postponements or cancellations of customer purchases of our products and services, or delays in the execution of license agreement renewals in the same quarter in which the original agreements expire.

Because of the nature of their products and manufacturing processes and their global operations, companies in the process and other capital-intensive industries are subject to risk of adverse or even catastrophic environmental, safety and health accidents or incidents and are often subject to changing standards and regulations worldwide.

In addition, worldwide economic downturns and pricing pressures experienced by energy, chemical, engineering and construction, and other capital-intensive industries have led to consolidations and reorganizations. In particular, we believe that the volatility in oil prices has impacted and may continue to impact the operating levels and capital spending by certain of our customers in the engineering and construction market, which has resulted and could continue to result in less predictable and lower demand for our products and services.

Any such adverse environmental, safety or health incident, change in regulatory standards, or economic downturn that affects the capital-intensive industries, including continued challenges and uncertainty among customers whose business is adversely affected by volatility in oil prices, as well as general domestic and foreign economic conditions and other factors that reduce spending by companies in these industries, could harm our operating results in the future.

Unfavorable economic and market conditions or a lessening demand in the market for asset optimization software could adversely affect our operating results.

Our business is influenced by a range of factors that are beyond our control and difficult or impossible to predict. If the market for asset optimization software grows more slowly than we anticipate, demand for our products and services could decline and our operating results could be impaired. Further, the state of the global economy may deteriorate in the future. Our operating results may be adversely affected by unfavorable global economic and market conditions, including significant volatility in oil prices, as well as a lessening demand for asset optimization software generally.

Customer demand for our products is linked to the strength of the global economy. If weakness in the global economy persists, many customers, including those whose businesses are negatively impacted by lower oil prices, may delay or reduce technology purchases. This could result in reductions in sales of our products, longer sales cycles, slower adoption of new technologies, increased price competition or reduced use of our products by our customers. We will lose revenue if demand for our products is reduced because potential customers experience weak or deteriorating economic conditions, catastrophic environmental or other events, and our business, results of operations, financial condition and cash flow from operations would likely be adversely affected.

The majority of our revenue is attributable to operations outside the United States, and our operating results therefore may be materially affected by the economic, political, military, regulatory and other risks of foreign operations or of transacting business with customers outside the United States.

As of June 30, 2019, we operated in 32 countries. We sell our products primarily through a direct sales force located throughout the world. In the event that we are unable to adequately staff and maintain our foreign operations, we could face difficulties managing our international operations.

Customers outside the United States accounted for the majority of our total revenue during the fiscal years ended June 30, 2019, 2018 and 2017. We anticipate that revenue from customers outside the United States will continue to account for a significant portion of our total revenue for the foreseeable future. Our operating results attributable to operations outside the United States are subject to additional risks, including:

- unexpected changes in regulatory or environmental requirements, tariffs and other barriers, including, for example, international trade disputes, changes in climate regulations, sanctions or other regulatory restrictions imposed by the United States or foreign governments; and the effects of the United Kingdom European Union membership referendum in June 2016 and the subsequent withdrawal process initiated in March 2017;
- less effective protection of intellectual property;
- requirements of foreign laws and other governmental controls;
- delays in the execution of license agreement renewals in the same quarter in which the original agreements expire;
- difficulties in collecting trade accounts receivable in other countries;
- adverse tax consequences; and

- the challenges of managing legal disputes in foreign jurisdictions.

Fluctuations in foreign currency exchange rates could result in declines in our reported revenue and operating results.

During fiscal 2019, 2018 and 2017, 10.2%, 9.1% and 9.4% of our total revenue was denominated in a currency other than the U.S. dollar, respectively. In addition, certain of our operating expenses incurred outside the United States are denominated in currencies other than the U.S. dollar. Our reported revenue and operating results are subject to fluctuations in foreign exchange rates. Foreign currency risk arises primarily from the net difference between non-U.S. dollar receipts from customers outside the United States and non-U.S. dollar operating expenses for subsidiaries in foreign countries. Currently, our largest exposures to foreign exchange rates exist primarily with the Euro, Pound Sterling, Canadian Dollar and Japanese Yen against the U.S. dollar. During fiscal 2019, 2018 and 2017, we did not enter into, and were not a party to any, derivative financial instruments, such as forward currency exchange contracts, intended to manage the volatility of these market risks. We cannot predict the impact of foreign currency fluctuations, and foreign currency fluctuations in the future may adversely affect our revenue and operating results. Any hedging policies we may implement in the future may not be successful, and the cost of those hedging techniques may have a significant negative impact on our operating results.

Competition from software offered by current competitors and new market entrants, as well as from internally developed solutions by our customers, could adversely affect our ability to sell our software products and related services and could result in pressure to price our products in a manner that reduces our margins.

Our markets in general are competitive and differ among our principal product areas: engineering, manufacturing, supply chain management and asset performance management. We face challenges in selling our solutions to large companies that have internally developed their own proprietary software solutions, and we face competition from well-established vendors as well as new entrants in our markets. Many of our current and potential competitors have greater financial, technical, marketing, service and other resources than we have. As a result, these companies may be able to offer lower prices, additional products or services, or other incentives that we cannot match or offer. These competitors may be in a stronger position to respond more quickly to new technologies and may be able to undertake more extensive marketing campaigns. We believe they also have adopted and may continue to pursue more aggressive pricing policies and make more attractive offers to potential customers, employees and strategic partners. For example, some competitors may be able to initiate relationships through sales and installations of hardware and then seek to expand their customer relationships by offering asset optimization software at a discount. In addition, many of our competitors have established, and may in the future continue to establish, cooperative relationships with third parties to improve their product offerings and to increase the availability of their products in the marketplace. Competitors with greater financial resources may make strategic acquisitions to increase their ability to gain market share or improve the quality or marketability of their products.

Competition could seriously impede our ability to sell additional software products and related services on terms favorable to us. Businesses may continue to enhance their internally developed solutions, rather than investing in commercial software such as ours. Our current and potential commercial competitors may develop and market new technologies that render our existing or future products obsolete, unmarketable or less competitive. In addition, if these competitors develop products with similar or superior functionality to our products, we may need to decrease the prices for our products in order to remain competitive. If we are unable to maintain our current pricing due to competitive pressures, our margins will be reduced and our operating results will be negatively affected. We cannot ensure that we will be able to compete successfully against current or future competitors or that competitive pressures will not materially adversely affect our business, financial condition and operating results.

Defects or errors in our software products could harm our reputation, impair our ability to sell our products and result in significant costs to us.

Our software products are complex and may contain undetected defects or errors. We have not suffered significant harm from any defects or errors to date, but we have from time to time found defects in our products and we may discover additional defects in the future. We may not be able to detect and correct defects or errors before releasing products. Consequently, we or our customers may discover defects or errors after our products have been implemented. We have in the past issued, and may in the future need to issue, corrective releases of our products to remedy defects or errors. The occurrence of any defects or errors could result in:

- lost or delayed market acceptance and sales of our products;
- delays in payment to us by customers;
- product returns;
- injury to our reputation;

- diversion of our resources;
- increased service and warranty expenses or financial concessions;
- increased insurance costs; and
- legal claims, including product liability claims.

Defects and errors in our software products could result in claims for substantial damages against us.

Potential acquisitions could be difficult to consummate and integrate into our operations, and they and investment transactions could disrupt our business, dilute stockholder value or impair our financial results.

As part of our business strategy, we may continue from time to time to seek to grow our business through acquisitions of or investments in new or complementary businesses, technologies or products that we believe can improve our ability to compete in our existing customer markets or allow us to enter new markets. The potential risks associated with acquisitions and investment transactions include, but are not limited to:

- failure to realize anticipated returns on investment, cost savings and synergies;
- difficulty in assimilating the operations, policies and personnel of the acquired company;
- unanticipated costs associated with acquisitions;
- challenges in combining product offerings and entering into new markets in which we may not have experience;
- distraction of management's attention from normal business operations;
- potential loss of key employees of the acquired company;
- difficulty implementing effective internal controls over financial reporting and disclosure controls and procedures;
- impairment of relationships with customers or suppliers;
- possibility of incurring impairment losses related to goodwill and intangible assets; and
- other issues not discovered in due diligence, which may include product quality issues or legal or other contingencies

Acquisitions and/or investments may also result in potentially dilutive issuances of equity securities, the incurrence of debt and contingent liabilities, the expenditure of available cash, and amortization expenses or write-downs related to intangible assets such as goodwill, any of which could have a material adverse effect on our operating results or financial condition. Investments in immature businesses with unproven track records and technologies have an especially high degree of risk, with the possibility that we may lose our entire investment or incur unexpected liabilities. We may experience risks relating to the challenges and costs of closing a business combination or investment transaction and the risk that an announced business combination or investment transaction may not close. There can be no assurance that we will be successful in making additional acquisitions in the future or in integrating or executing on our business plan for existing or future acquisitions.

We may be subject to significant expenses and damages because of product-related claims.

In the ordinary course of business, we are, from time to time, involved in lawsuits, claims, investigations, proceedings and threats of litigation. The amount of damages cannot be predicted with certainty, and a successful claim brought against us could materially harm our business and financial condition. Product-related claims, even if not successful, could damage our reputation, cause us to lose existing clients, limit our ability to obtain new clients, divert management's attention from operations, result in significant revenue loss, create potential liabilities for our clients and us, and increase insurance and other operational costs.

Claims that we infringe the intellectual property rights of others may be costly to defend or settle and could damage our business.

We cannot be certain that our software and services do not infringe patents, copyrights, trademarks or other intellectual property rights, so infringement claims might be asserted against us. In addition, we have agreed, and may agree in the future, to indemnify certain of our customers against infringement claims that third parties may assert against our customers based on use of our software or services. Such claims may have a material adverse effect on our business, may be time-consuming and may result in substantial costs and diversion of resources, including our management's attention to our business. Furthermore, a party making an infringement claim could secure a judgment that requires us to pay substantial damages and could also include

an injunction or other court order that could prevent us from selling our software or require that we re-engineer some or all of our products. Claims of intellectual property infringement also might require us to enter costly royalty or license agreements. We may be unable to obtain royalty or license agreements on terms acceptable to us or at all. Our business, operating results and financial condition could be harmed significantly if any of these events were to occur, and the price of our common stock could be adversely affected.

We may not be able to protect our intellectual property rights, which could make us less competitive and cause us to lose market share.

Our software is proprietary. Our strategy is to rely on a combination of copyright, patent, trademark and trade secret laws in the United States and other jurisdictions, and to rely on license and confidentiality agreements and software security measures to further protect our proprietary technology and brand. We have obtained or applied for patent protection with respect to some of our intellectual property, but generally do not rely on patents as a principal means of protecting our intellectual property. We have registered or applied to register some of our trademarks in the United States and in selected other countries. We generally enter into non-disclosure agreements with our employees and customers, and historically have restricted third-party access to our software and source code, which we regard as proprietary information. In certain cases, we have provided copies of source code to customers for the purpose of special product customization or have deposited copies of the source code with a third-party escrow agent as security for ongoing service and license obligations. In these cases, we rely on non-disclosure and other contractual provisions to protect our proprietary rights.

The steps we have taken to protect our proprietary rights may not be adequate to deter misappropriation of our technology or independent development by others of technologies that are substantially equivalent or superior to our technology. Our intellectual property rights may expire or be challenged, invalidated or infringed upon by third parties or we may be unable to maintain, renew or enter into new licenses on commercially reasonable terms. Any misappropriation of our technology or development of competitive technologies could harm our business and could diminish or cause us to lose the competitive advantages associated with our proprietary technology, and could subject us to substantial costs in protecting and enforcing our intellectual property rights, and/or temporarily or permanently disrupt our sales and marketing of the affected products or services. The laws of some countries in which our products are licensed do not protect our intellectual property rights to the same extent as the laws of the United States. Moreover, in some non-U.S. countries, laws affecting intellectual property rights are uncertain in their application, which can affect the scope of enforceability of our intellectual property rights.

Our software research and development initiatives and our customer relationships could be compromised if the security of our information technology is breached as a result of a cyber-attack. This could have a material adverse effect on our business, operating results and financial condition, and could harm our competitive position.

We devote significant resources to continually updating our software and developing new products, and our financial performance is dependent in part upon our ability to bring new products and services to market. Our customers use our software to optimize their manufacturing processes and manage asset performance, and they rely on us to provide updates and releases as part of our software maintenance and support services, and to provide remote on-line troubleshooting support. The security of our information technology environment is therefore important to our research and development initiatives, and an important consideration in our customers' purchasing decisions. We maintain cybersecurity policies and procedures, including employee training, to manage risk to our information systems, and we continually evaluate and adapt our systems and processes to mitigate evolving cybersecurity threats. We may incur additional costs to maintain appropriate cybersecurity protections in response to evolving cybersecurity threats, and we may not be able to safeguard against all data security breaches or misuses of data. If the security of our systems is impaired, our development initiatives might be disrupted, and we might be unable to provide service. Our customer relationships might deteriorate, our reputation in the industry could be harmed, and we could be subject to liability claims. This could reduce our revenues, and expose us to significant costs to detect, correct and avoid recurrences of any breach of security and to defend any claims against us. In addition, our insurance coverage may not be adequate to cover all costs related to cybersecurity incidents and the disruptions resulting from such events.

Risks Related to Our Common Stock

Our common stock may experience substantial price and volume fluctuations.

The equity markets have from time to time experienced extreme price and volume fluctuations, particularly in the high technology sector, and those fluctuations often have been unrelated to the operating performance of particular companies. In addition, the market price of our common stock may be affected by other factors, such as: (i) our financial performance; (ii) announcements of technological innovations or new products by us or our competitors; and (iii) market conditions in the computer software or hardware industries.

In the past, following periods of volatility in the market price of a public company's securities, securities class action litigation has often been instituted against that company. This type of litigation against us could result in substantial liability and costs and divert management's attention and resources.

Our corporate documents and provisions of Delaware law may prevent a change in control or management that stockholders may consider desirable.

Section 203 of the Delaware General Corporation Law, our charter and our by-laws contain provisions that might enable our management to resist a takeover of our company. These provisions include:

- limitations on the removal of directors;
- a classified board of directors, so that not all members of the board are elected at one time;
- advance notice requirements for stockholder proposals and nominations;
- the inability of stockholders to act by written consent or to call special meetings;
- the ability of the board to make, alter or repeal our by-laws; and
- the ability of the board to designate the terms of and issue new series of preferred stock without stockholder approval.

These provisions could:

- have the effect of delaying, deferring or preventing a change in control of our company or a change in our management that stockholders may consider favorable or beneficial;
- discourage proxy contests and make it more difficult for stockholders to elect directors and take other corporate actions; and
- limit the price that investors might be willing to pay in the future for shares of our common stock.

Item 1B. Unresolved Staff Comments.

None.

Item 2. Properties.

Our principal executive offices are located in leased facilities in Bedford, Massachusetts, consisting of approximately 143,000 square feet of office space to accommodate our product development, sales, marketing, operations, finance and administrative functions. The lease for our Bedford executive offices commenced in November 2014 and is scheduled to expire March 2025. Subject to the terms and conditions of the lease, we may extend the term of the lease for two successive terms of five years each.

We also lease approximately 63,000 square feet in Houston, Texas to accommodate sales, services and product development functions. In addition to our Bedford and Houston locations, we lease office space in the United Kingdom, Shanghai, Mexico City, Singapore, Beijing, Pune, Moscow, Tokyo, and Bahrain, to accommodate sales, services and product development functions.

In the remainder of our other locations, the majority of our leases have lease terms of one year or less that are generally based on the number of workstations required. We believe this facilities strategy provides us with significant flexibility to adjust to changes in our business environment. We do not own any real property. We believe that our leased facilities are adequate for our anticipated future needs.

Item 3. Legal Proceedings.

None.

Item 4. Mine Safety Disclosures

None.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Market Information

Our common stock currently trades on The NASDAQ Global Select Market under the symbol "AZPN." The closing price of our common stock on June 30, 2019 was \$124.28.

Holders

On August 30, 2019, there were 343 holders of record of our common stock. The number of record holders does not include persons who held common stock in nominee or "street name" accounts through brokers.

Dividends

We have never declared or paid cash dividends on our common stock. We do not anticipate paying cash dividends on our common stock in the foreseeable future. On February 26, 2016, we entered into a \$250.0 million Credit Agreement (the "Credit Agreement") with JPMorgan Chase Bank, N.A., as administrative agent, Silicon Valley Bank, as syndication agent, and the lenders and other parties named therein (the "Lenders"). On August 9, 2017, we entered into an Amendment to increase the Credit Agreement to \$350.0 million. The Credit Agreement restricts us from declaring or paying dividends in cash on our capital stock if our Leverage Ratio is in excess of 2.75 to 1.00 (refer to "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations" and Note 11, "Credit Agreement," to our Consolidated Financial Statements for further discussion of the Credit Agreement). Our Leverage Ratio is below 2.75 to 1.00 as of June 30, 2019. Any future determination relating to our dividend policy will be made at the discretion of the Board of Directors and will depend on a number of factors, including our future earnings, capital requirements, financial condition and future prospects and such other factors as the Board of Directors may deem relevant.

Purchases of Equity Securities by the Issuer

As of June 30, 2019, the total number of shares of common stock repurchased since November 1, 2010 under all programs approved by the Board of Directors was 35,017,726 shares.

On January 22, 2015, our Board of Directors approved a share repurchase program (the "Share Repurchase Program") for up to \$450.0 million worth of our common stock. On April 26, 2016, June 8, 2017, April 18, 2018, December 6, 2018, and April 17, 2019, the Board of Directors approved a \$400.0 million, \$200.0 million, \$200.0 million, \$100.0 million, and \$200.0 million increase in the Share Repurchase Program, respectively. Under the share repurchase program, purchases can be made from time to time using a variety of methods, which may include open market purchases, accelerated buyback programs, and others. The specific timing, price and size of purchases will depend on prevailing stock prices, general market and economic conditions, and other considerations, including the amount of cash generated in the United States and other potential uses of cash, such as acquisitions. Purchases may be made through a Rule 10b5-1 plan pursuant to predetermined metrics set forth in such plan. The Board of Directors' authorization of the share repurchase program does not obligate us to acquire any particular amount of common stock, and the program may be suspended or discontinued at any time.

During fiscal 2019, we repurchased 3,074,127 shares of our common stock in the open market for \$300.0 million. During fiscal 2018, we repurchased 2,797,623 shares of our common stock in the open market for \$200.0 million. During fiscal 2017, we repurchased 5,185,257 shares of our common stock in the open market for \$275.0 million and 2,106,709 shares of our common stock for \$100.0 million as part of an accelerated share repurchase program.

As of June 30, 2019, the total remaining value under the Share Repurchase Program was approximately \$346.3 million.

The following table sets forth, for the month indicated, our purchases of common stock during the fourth quarter of fiscal 2019:

Issuer Purchases of Equity Securities

Period	Total Number of Shares Purchased (2)	Average Price Paid per Share (3)	Total Number of Shares Purchased as Part of Publicly Announced Program (1)	Approximate Dollar Value of Shares that May Yet Be Purchased Under the Program (4)
April 1 to 30, 2019	220,494	\$ 109.87	220,494	
May 1 to 31, 2019	228,757	116.23	228,757	
June 1 to 30, 2019	198,400	121.90	198,400	
	<u>647,651</u>	<u>\$ 115.80</u>	<u>647,651</u>	<u>\$ 346,293,261</u>

(1) On January 22, 2015, our Board of Directors approved the Share Repurchase Program for up to \$450.0 million worth of our common stock. On April 26, 2016, June 8, 2017, April 18, 2018, December 6, 2018, and April 17, 2019, the Board of Directors approved a \$400.0 million, \$200.0 million, \$200.0 million, \$100.0 million, and \$200.0 million increase in the Share Repurchase Program, respectively.

(2) As of June 30, 2019, the total number of shares of common stock repurchased under all programs approved by the Board of Directors was 35,017,726, including purchases under an accelerated share repurchase program.

(3) The total average price paid per share is calculated as the total amount paid for the repurchase of our common stock during the period divided by the total number of shares repurchased.

(4) As of June 30, 2019, the total remaining value under the Share Repurchase Program approved on January 22, 2015 and amended on April 26, 2016, June 8, 2017, April 18, 2018, December 6, 2018, and April 17, 2019 was approximately \$346.3 million.

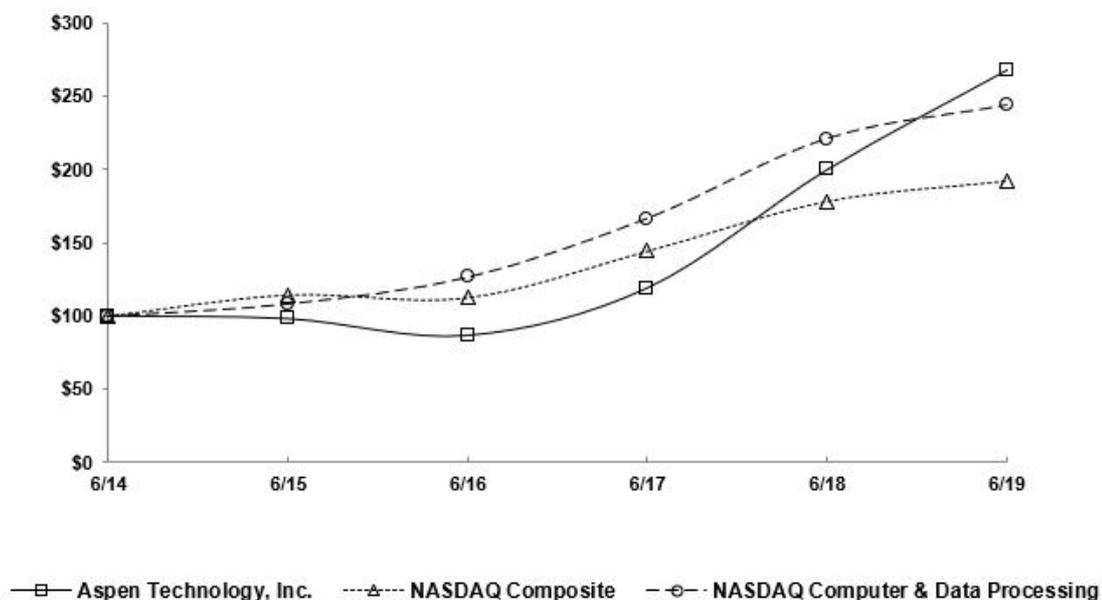
Stockholder Return Comparison

The information included in this section is not deemed to be "soliciting material" or to be "filed" with the SEC or subject to Regulation 14A or 14C under the Securities Exchange Act or to the liabilities of Section 18 of the Securities Exchange Act, and will not be deemed to be incorporated by reference into any filing under the Securities Act or the Securities Exchange Act, except to the extent we specifically incorporate it by reference into such a filing.

The graph below matches the cumulative 5-year total return of holders of our common stock with the cumulative total returns of the NASDAQ Composite index and the NASDAQ Computer & Data Processing index. The graph assumes that the value of the investment in our common stock and in each of the indexes (including reinvestment of dividends) was \$100 on June 30, 2014 and tracks it through June 30, 2019.

COMPARISON OF 5 YEAR CUMULATIVE TOTAL RETURN*

Among Aspen Technology, Inc., the NASDAQ Composite Index and the NASDAQ Computer & Data Processing Index



*\$100 invested on 6/30/14 in stock or index, including reinvestment of dividends.
Fiscal year ending June 30.

The stock price performance included in this graph is not necessarily indicative of future stock price performance.

	Year Ended June 30,					
	2014	2015	2016	2017	2018	2019
Aspen Technology, Inc.	\$ 100.00	\$ 98.17	\$ 86.72	\$ 119.09	\$ 199.87	\$ 267.84
NASDAQ Composite	\$ 100.00	\$ 114.44	\$ 112.51	\$ 144.35	\$ 178.42	\$ 192.30
NASDAQ Computer & Data Processing	\$ 100.00	\$ 108.37	\$ 126.57	\$ 166.63	\$ 221.04	\$ 243.84

Item 6. Selected Financial Data.

The following tables present selected consolidated financial data for Aspen Technology, Inc. The consolidated statements of operations data set forth below for fiscal 2019, 2018 and 2017 and the consolidated balance sheets data as of June 30, 2019 and 2018, are derived from our consolidated financial statements included beginning on page F-1 of this Form 10-K. The consolidated statements of operations data for fiscal 2016 and 2015 and the consolidated balance sheet data as of June 30, 2017, 2016, and 2015 are derived from our consolidated financial statements that are not included in this Form 10-K. The data presented below should be read in conjunction with our consolidated financial statements and accompanying notes beginning on page F-1 and "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations."

Our historical results should not be viewed as indicative of results expected for any future period.

As a result of the adoption of new guidance related to revenue recognition during fiscal year 2019, as described in Note 3, "Revenue from Contracts with Customers," to our audited Consolidated Financial Statements in this Form 10-K, prior period information for fiscal years 2018 and 2017 included below has been restated to reflect the new guidance. Prior period information for fiscal years 2015 and 2016 has not been restated and is, therefore, not comparable to the fiscal year 2019, 2018, and 2017 information.

	Year Ended June 30,				
	2019	2018	2017	2016	2015
	As Adjusted		As Adjusted		
(in Thousands, except per share data)					
Consolidated Statements of Operations Data:					
Revenue(1)	\$ 598,345	\$ 518,859	\$ 494,427	\$ 472,344	\$ 440,401
Gross profit	540,529	468,215	446,961	423,733	390,825
Income from operations	282,802	219,221	216,719	211,381	179,792
Net income	\$ 262,734	\$ 293,703	\$ 179,386	\$ 139,951	\$ 118,407
Basic income per share	\$ 3.76	\$ 4.07	\$ 2.35	\$ 1.69	\$ 1.34
Diluted income per share	\$ 3.71	\$ 4.03	\$ 2.33	\$ 1.68	\$ 1.33
Weighted average shares outstanding—Basic	69,925	72,140	76,491	82,892	88,398
Weighted average shares outstanding—Diluted	70,787	72,956	76,978	83,309	89,016

	Year Ended June 30,				
	2019	2018	2017	2016	2015
	As Restated		As Adjusted		
(in Thousands)					
Consolidated Balance Sheet Data:					
Cash and cash equivalents	\$ 71,926	\$ 96,165	\$ 101,954	\$ 318,336	\$ 156,249
Marketable securities	—	—	—	3,006	62,244
Accounts receivable, net	47,784	41,810	42,656	20,476	30,721
Installments receivable, net	—	—	—	267	1,842
Contract assets	619,703	557,377	561,017	—	—
Total assets	903,065	852,843	843,828	419,738	315,361
Borrowings (1)	220,000	170,000	140,000	140,000	—
Deferred revenue	44,891	27,504	44,860	282,078	288,887
Working capital (deficit)	108,285	158,029	215,790	(71,300)	(32,836)
Total stockholders' equity (deficit)	393,285	407,927	286,242	(75,034)	(48,546)

(1) In February 2016, we entered into a Credit Agreement. Refer to “Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations” and Note 11, “Credit Agreement,” to our Consolidated Financial Statements for further discussion of the Credit Agreement.

Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations.

You should read the following discussion in conjunction with our consolidated financial statements and related notes beginning on page F-1. In addition to historical information, this discussion contains forward-looking statements that involve risks and uncertainties. You should read “Item 1A. Risk Factors” for a discussion of important factors that could cause our actual results to differ materially from our expectations.

Our fiscal year ends on June 30, and references to a specific fiscal year are the twelve months ended June 30 of such year (for example, “fiscal 2019” refers to the year ended June 30, 2019).

Business Overview

We are a leading global supplier of asset optimization solutions that optimize asset design, operations and maintenance in complex, industrial environments. We combine decades of process modeling and operations expertise with big data machine-

learning and analytics. Our purpose-built software solutions improve the competitiveness and profitability of our customers by increasing throughput, energy efficiency, and production, reducing unplanned downtime, enhancing capital efficiency, and decreasing working capital requirements over the entire asset lifecycle to support operational excellence.

Our software incorporates our proprietary mathematical and empirical models of manufacturing and planning processes and reflects the deep domain expertise we have amassed from focusing on solutions for the process and other capital-intensive industries for over 35 years. We have developed our applications to design and optimize processes across three principal business areas: engineering, manufacturing and supply chain, and asset performance management. We are a recognized market and technology leader in providing process optimization and asset performance management software solutions for each of these business areas.

We have established sustainable competitive advantages based on the following strengths:

- Innovative products that can enhance our customers' profitability and productivity;
- Long-term customer relationships;
- Large installed base of users of our software; and
- Long-term license contracts.

We have approximately 2,300 customers globally. Our customers consist of companies engaged in the process and other capital-intensive industries such as energy, chemicals, engineering and construction, as well as pharmaceuticals, transportation, power, metals and mining, pulp and paper, and consumer packaged goods.

Business Segments

We have two operating and reportable segments, which are consistent with our reporting units: i) subscription and software and ii) services and other. The subscription and software segment is engaged in the licensing of process optimization and asset performance management software solutions and associated support services, and includes our license and maintenance revenue. The services and other segment includes professional services and training, and includes our services and other revenue.

Recent Events

On July 12, 2019, we completed the acquisition of all the outstanding shares of Mnubo Inc. ("Mnubo"), a provider of purpose-built artificial intelligence and analytics infrastructure for the internet of things, for a total cash consideration of \$78.0 million. We intend to account for the Mnubo acquisition as a business combination. The allocation of the purchase price is subject to the valuation of the net assets acquired.

Key Components of Operations

Revenue

We generate revenue primarily from the following sources:

License Revenue. We sell our software products to end users, primarily under fixed-term licenses, through a subscription offering which we refer to as our aspenONE licensing model. The aspenONE licensing model includes software maintenance and support, known as our Premier Plus SMS offering, for the entire term. Our aspenONE products are organized into three suites: 1) engineering; 2) manufacturing and supply chain; and 3) asset performance management. The aspenONE licensing model provides customers with access to all of the products within the aspenONE suite(s) they license. Customers can change or alternate the use of multiple products in a licensed suite through the use of exchangeable units of measurement, called tokens, licensed in quantities determined by the customer. This licensing system enables customers to use products as needed and to experiment with different products to best solve whatever critical business challenges they face. Customers can increase their usage of our software by purchasing additional tokens as business needs evolve.

We also license our software through point product arrangements with our Premier Plus SMS offering included for the contract term.

Maintenance Revenue. We provide customers technical support, access to software fixes and updates and the right to any new unspecified future software products and updates that may be introduced into the licensed aspenONE software suite. Our technical support services are provided from our customer support centers throughout the world, as well as via email and through our support website.

Services and Other Revenue. We provide training and professional services to our customers. Our professional services are focused on implementing our technology in order to improve customers' plant performance and gain better operational data. Customers who use our professional services typically engage us to provide those services over periods of up to 24 months. We charge customers for professional services on a time-and-materials or fixed-price basis. We provide training services to our customers, including on-site, Internet-based and customized training.

Cost of Revenue

Cost of License. Our cost of license revenue consists of (i) royalties, (ii) amortization of capitalized software and intangibles, and (iii) distribution fees.

Cost of Maintenance. Our cost of maintenance revenue consists primarily of personnel-related costs of providing Premier Plus SMS bundled with our aspenONE licensing and point product arrangements.

Cost of Services and Other. Our cost of services and other revenue consists primarily of personnel-related and external consultant costs associated with providing customers professional services and training.

Operating Expenses

Selling and Marketing Expenses. Selling expenses consist primarily of the personnel and travel expenses related to the effort expended to license our products and services to current and potential customers, as well as for overall management of customer relationships. Marketing expenses include expenses needed to promote our company and our products and to conduct market research to help us better understand our customers and their business needs.

Research and Development Expenses. Research and development expenses consist primarily of personnel expenses related to the creation of new software products, enhancements and engineering changes to existing products.

General and Administrative Expenses. General and administrative expenses include the costs of corporate and support functions, such as executive leadership and administration groups, finance, legal, human resources and corporate communications, and other costs, such as outside professional and consultant fees and provision for bad debts.

Other Income and Expenses

Interest Income. Interest income is recorded for financing components under Accounting Standards Update (ASU) No. 2014-09, *Revenue from Contracts with Customers* ("Topic 606"). When a contract includes a significant financing component, we generally receive the majority of the customer consideration after the recognition of a substantial portion of the arrangement fee as license revenue. As a result, we decrease the amount of revenue recognized and increase interest income by a corresponding amount. Interest income also includes the accretion of interest on investments in short-term money market instruments.

Interest (Expense). Interest (expense) is primarily related to our Credit Agreement.

Other Income (Expense), Net. Other income (expense), net is comprised primarily of foreign currency exchange gains (losses) generated from the settlement and remeasurement of transactions denominated in currencies other than the functional currency of our operating units. During fiscal 2017, other income (expense), net also included a \$0.7 million litigation related recovery receipt.

Provision for (Benefit From) Income Taxes. Provision for (benefit from) income taxes is comprised of domestic and foreign taxes. We record interest and penalties related to income tax matters as a component of income tax expense. Our effective income tax rate may fluctuate between fiscal years and from quarter to quarter due to items arising from discrete events, such as tax benefits from the disposition of employee equity awards, settlements of tax audits and assessments and tax law changes. Our effective income tax rate is also impacted by, and may fluctuate in any given period because of, the composition of income in foreign jurisdictions where tax rates differ.

Key Business Metrics

Background

We utilize key business measures to track and assess the performance of our business. We have identified the following set of appropriate business metrics in the context of our evolving business:

- Annual spend
- Total contract value
- Bookings

We also use the following non-GAAP business metrics in addition to GAAP measures to track our business performance:

- Free cash flow
- Non-GAAP operating income

We make these measures available to investors and none of these metrics should be considered as an alternative to any measure of financial performance calculated in accordance with GAAP.

Annual Spend

Annual spend is an estimate of the annualized value of our portfolio of term license arrangements, as of a specific date. Management believes that this measure is a useful metric to investors as it provides insight into the growth component of license bookings during a fiscal period. Annual spend is calculated by summing the most recent annual invoice value of each of our active term license contracts. Annual spend also includes the annualized value of standalone SMS agreements purchased in conjunction with term license agreements. Comparing annual spend for different dates can provide insight into the growth and retention rates of our business, and since annual spend represents the estimated annualized billings associated with our active term license agreements, it provides insight into the future value of subscription and software revenue.

Annual spend increases as a result of new term license agreements with new or existing customers, renewals or modifications of existing term license agreements that result in higher license fees due to price escalation or an increase in the number of tokens (units of software usage) or products licensed, and escalation of annual payments in our active term license contracts.

Annual spend is adversely affected by term license and standalone SMS agreements that are renewed at a lower entitlement level or not renewed and, to a lesser extent, by customer contracts that are terminated during the contract term due to the customer's business ceasing operations.

We estimate that annual spend grew by approximately 10.6% during fiscal 2019, from \$489.3 million as of June 30, 2018 to \$541.0 million as of June 30, 2019. We estimate that annual spend grew by approximately 6.4% during fiscal 2018, from \$459.6 million as of June 30, 2017 to \$489.3 million as of June 30, 2018.

Total Contract Value

Total Contract Value ("TCV") is the aggregate value of all payments received or to be received under all active term license agreements, including maintenance and escalation. TCV was \$2.6 billion as of June 30, 2019.

Bookings

Bookings is the total value of customer term license contracts signed in the current period, less the value of such contracts signed in the current period where the initial licenses are not yet deemed delivered, plus term license contracts signed in a previous period for which the initial licenses are deemed delivered in the current period.

Bookings increased to \$651.8 million during fiscal 2019, compared to \$502.3 million and \$490.4 million during fiscal 2018 and 2017, respectively.

Free Cash Flow

We use a non-GAAP measure of free cash flow to analyze cash flows generated from our operations. Management believes that this financial measure is useful to investors because it permits investors to view our performance using the same tools that management uses to gauge progress in achieving our goals. We believe this measure is also useful to investors because it is an indication of cash flow that may be available to fund investments in future growth initiatives or to repay borrowings under the Credit Agreement, and it is a basis for comparing our performance with that of our competitors. The presentation of free cash flow is not meant to be considered in isolation or as an alternative to cash flows from operating activities as a measure of liquidity.

Free cash flow is calculated as net cash provided by operating activities adjusted for the net impact of (a) purchases of property, equipment and leasehold improvements, (b) capitalized computer software development costs, (c) excess tax benefits from stock-based compensation, (d) non-capitalized acquired technology, and (e) other nonrecurring items, such as acquisition and litigation related payments.

The following table provides a reconciliation of GAAP cash flow from operating activities to free cash flow for the indicated periods:

	June 30,		
	2019	2018	2017
	(Dollars in Thousands)		
GAAP cash flow from operating activities	\$ 238,313	\$ 206,936	\$ 182,386
Purchase of property, equipment, and leasehold improvements	(436)	(331)	(2,720)
Capitalized computer software development costs	(1,131)	(329)	(405)
Excess tax benefits from stock-based compensation	—	—	5,965
Non-capitalized acquired technology	—	75	2,246
Litigation related payments (receipts)	—	4,546	(721)
Acquisition related fee payments	27	1,148	448
Free cash flow (non-GAAP)	<u>\$ 236,773</u>	<u>\$ 212,045</u>	<u>\$ 187,199</u>

Excess tax benefits are related to stock-based compensation tax deductions in excess of book compensation expense and reduce our income taxes payable. We have included the impact of excess tax benefits within free cash flow in fiscal 2017 to be consistent with the treatment of other tax benefits. As a result of adopting ASU No. 2016-09, effective July 1, 2017, excess tax benefits from stock-based compensation are now reflected in the consolidated statements of operations as a component of the provision for income taxes, whereas they were previously a component of stockholders' equity.

In fiscal 2018 and 2017, we have excluded payments of \$0.1 million, and \$2.2 million, respectively, for non-capitalized acquired technology (including \$0.1 million and \$0.5 million in fiscal 2018 and 2017, respectively, of final payments related to non-capitalized acquired technology from prior fiscal years) from free cash flow to be consistent with the treatment of other transactions where the acquired technology assets were capitalized.

In fiscal 2018 we have excluded litigation related payments of \$4.5 million. In fiscal 2017, we have excluded a \$(0.7) million litigation related recovery receipt.

Fiscal 2019 Compared to Fiscal 2018

Total free cash flow increased \$24.7 million during fiscal 2019 as compared to the prior fiscal year primarily due to changes in working capital. For a more detailed description of these changes refer to "Liquidity and Capital Resources."

Fiscal 2018 Compared to Fiscal 2017

Total free cash flow increased \$24.8 million during fiscal 2018 as compared to the prior fiscal year primarily due to changes in working capital. For a more detailed description of these changes refer to "Liquidity and Capital Resources."

Non-GAAP Operating Income

Non-GAAP operating income excludes certain non-cash and non-recurring expenses, and is used as a supplement to operating income presented on a GAAP basis. We believe that non-GAAP operating income is a useful financial measure because removing certain non-cash and other items provides additional insight into recurring profitability and cash flow from operations.

The following table presents our net income, as adjusted for stock-based compensation expense, non-capitalized acquired technology, amortization of intangibles, and other items, such as the impact of litigation judgments and acquisition related fees, for the indicated periods, as adjusted for the adoption of Topic 606:

	June 30,			2019 Compared to 2018		2018 Compared to 2017	
	2019	2018	2017	\$	%	\$	%
	As Adjusted		As Adjusted				
GAAP income from operations	\$ 282,802	\$ 219,221	\$ 216,719	\$ 63,581	29.0 %	\$ 2,502	1.2 %
Plus:							
Stock-based compensation	27,573	22,688	18,800	4,885	21.5 %	3,888	20.7 %
Non-capitalized acquired technology	—	—	2,250	—	— %	(2,250)	(100.0)%
Amortization of intangibles	4,533	2,231	950	2,302	103.2 %	1,281	134.8 %
Litigation judgment	—	1,689	—	(1,689)	(100.0)%	1,689	100.0 %
Acquisition related fees	1,438	721	1,754	717	99.4 %	(1,033)	(58.9)%
Non-GAAP operating income	\$ 316,346	\$ 246,550	\$ 240,473	\$ 69,796	28.3 %	\$ 6,077	2.5 %

In fiscal 2017, we acquired technology that did not meet the accounting requirements for capitalization and therefore the cost of the acquired technology was expensed as research and development. We have excluded the expense of the acquired technology from non-GAAP operating income to be consistent with transactions where the acquired assets were capitalized. In fiscal 2018, we incurred an expense associated with a litigation judgment in the amount of \$1.7 million.

Results of Operations

The following table sets forth the results of operations, percentage of total revenue and the year-over-year percentage change in certain financial data for fiscal 2019, 2018 and 2017, as adjusted for the adoption of Topic 606:

	Year Ended June 30,						2019 Compared to 2018 %	2018 Compared to 2017 %
	2019		2018		2017			
	As Adjusted		As Adjusted		As Adjusted			
(Dollars in Thousands)								
Revenue:								
License	\$ 404,122	67.5 %	\$ 326,549	62.9 %	\$ 307,259	62.1 %	23.8 %	6.3 %
Maintenance	165,436	27.6	161,065	31.0	157,012	31.8	2.7	2.6
Services and other	28,787	4.9	31,245	6.1	30,156	6.1	(7.9)	3.6
Total revenue	598,345	100.0	518,859	100.0	494,427	100.0	15.3	4.9
Cost of revenue:								
License	7,060	1.2	5,236	1.0	4,231	0.9	34.8	23.8
Maintenance	19,208	3.2	17,408	3.4	16,821	3.4	10.3	3.5
Services and other	31,548	5.3	28,000	5.4	26,414	5.3	12.7	6.0
Total cost of revenue	57,816	9.7	50,644	9.8	47,466	9.6	14.2	6.7
Gross profit	540,529	90.3	468,215	90.2	446,961	90.4	15.4	4.8
Operating expenses:								
Selling and marketing	111,374	18.6	99,737	19.2	91,977	18.6	11.7	8.4
Research and development	83,122	13.9	82,076	15.8	79,530	16.1	1.3	3.2
General and administrative	63,231	10.6	67,181	12.9	58,735	11.9	(5.9)	14.4
Total operating expenses	257,727	43.1	248,994	47.9	230,242	46.6	3.5	8.1
Income from operations	282,802	47.3	219,221	42.3	216,719	43.8	29.0	1.2
Interest income	28,457	4.8	24,954	4.8	22,942	4.6	14.0	8.8
Interest expense	(8,733)	(1.5)	(5,691)	(1.1)	(3,787)	(0.8)	53.5	50.3
Other income (expense), net	664	0.1	(838)	(0.2)	1,309	0.3	(179.2)	(164.0)
Income before income taxes	303,190	50.7	237,646	45.8	237,183	47.9	27.6	0.2
Provision for (benefit from) income taxes	40,456	6.8	(56,057)	(10.8)	57,797	11.7	(172.2)	(197.0)
Net income	\$ 262,734	43.9 %	\$ 293,703	56.6 %	\$ 179,386	36.2 %	(10.5)%	63.7 %

Revenue

Fiscal 2019 Compared to Fiscal 2018

Total revenue increased by \$79.5 million during fiscal 2019 as compared to the prior fiscal year. The increase of \$79.5 million was due to an increase in license revenue of \$77.6 million and an increase in maintenance revenue of \$4.4 million, partially offset by a decrease in services and other revenue of \$(2.5) million, as compared to the prior fiscal year.

Fiscal 2018 Compared to Fiscal 2017

Total revenue increased by \$24.4 million during fiscal 2018 as compared to the prior fiscal year. The increase of \$24.4 million was due to an increase in license revenue of \$19.3 million, an increase in maintenance revenue of \$4.1 million, and an increase in services and other revenue of \$1.1 million as compared to the prior fiscal year.

License Revenue

	Year Ended June 30,			2019 Compared to 2018		2018 Compared to 2017	
	2019	2018	2017	\$	%	\$	%
	As Adjusted		As Adjusted				
(Dollars in Thousands)							
License revenue	\$ 404,122	\$ 326,549	\$ 307,259	\$ 77,573	23.8%	\$ 19,290	6.3%
As a percent of total revenue	67.5%	62.9%	62.1%				

Fiscal 2019 Compared to Fiscal 2018

The increase in license revenue of \$77.6 million during fiscal 2019 as compared to the prior fiscal year was primarily due to an increase in bookings and the timing of renewals.

Fiscal 2018 Compared to Fiscal 2017

The increase in license revenue of \$19.3 million during fiscal 2018 as compared to the prior fiscal year was primarily due to the timing of renewals.

Maintenance Revenue

	Year Ended June 30,			2019 Compared to 2018		2018 Compared to 2017	
	2019	2018	2017	\$	%	\$	%
	As Adjusted		As Adjusted				
(Dollars in Thousands)							
Maintenance revenue	\$ 165,436	\$ 161,065	\$ 157,012	\$ 4,371	2.7%	\$ 4,053	2.6%
As a percent of total revenue	27.6%	31.0%	31.8%				

Fiscal 2019 Compared to Fiscal 2018

The increase in maintenance revenue of \$4.4 million during fiscal 2019 as compared to the prior fiscal year was primarily due to growth of our base of arrangements, which include maintenance, being recognized on a ratable basis.

We expect maintenance revenue to increase as a result of: (i) having a larger base of arrangements recognized on a ratable basis; (ii) increased customer usage of our software; (iii) adding new customers; and (iv) escalating annual payments.

Fiscal 2018 Compared to Fiscal 2017

The increase in maintenance revenue of \$4.1 million during fiscal 2018 as compared to the prior fiscal year was primarily due to growth of our base of arrangements, which include maintenance, being recognized on a ratable basis.

Services and Other Revenue

	Year Ended June 30,			2019 Compared to 2018		2018 Compared to 2017	
	2019	2018	2017	\$	%	\$	%
	As Adjusted		As Adjusted				
(Dollars in Thousands)							
Services and other revenue	\$ 28,787	\$ 31,245	\$ 30,156	\$ (2,458)	(7.9)%	\$ 1,089	3.6%
As a percent of total revenue	4.9%	6.1%	6.1%				

We recognize professional services revenue for our time-and-materials ("T&M") contracts based upon hours worked and contractually agreed-upon hourly rates. Revenue from fixed-price engagements is recognized using the proportional performance method based on the ratio of costs incurred to the total estimated project costs.

Fiscal 2019 Compared to Fiscal 2018

Services and other revenue decreased by \$2.5 million during fiscal 2019 as compared to the prior fiscal year primarily due to the timing of professional services engagements.

Fiscal 2018 Compared to Fiscal 2017

Services and other revenue increased by \$1.1 million during fiscal 2018 as compared to the prior fiscal year primarily due to the timing of professional services engagements.

Cost of Revenue

Cost of License Revenue

	Year Ended June 30,			2019 Compared to 2018		2018 Compared to 2017	
	2019	2018	2017	\$	%	\$	%
	As Adjusted		As Adjusted				
(Dollars in Thousands)							
Cost of license revenue	\$ 7,060	\$ 5,236	\$ 4,231	\$ 1,824	34.8%	\$ 1,005	23.8%
As a percent of license revenue	1.7%	1.6%	1.4%				

Cost of license revenue increased by \$1.8 million during fiscal 2019 as compared to the prior fiscal year primarily due to higher amortization of intangibles of \$2.3 million. Cost of license revenue increased by \$1.0 million during fiscal year 2018 as compared to the prior fiscal year primarily due to higher amortization of intangibles of \$1.3 million. License gross profit margin was 98.3% in fiscal 2019 and was consistent with 98.4% and 98.6% in fiscal years 2018 and 2017, respectively.

Cost of Maintenance Revenue

	Year Ended June 30,			2019 Compared to 2018		2018 Compared to 2017	
	2019	2018	2017	\$	%	\$	%
	As Adjusted		As Adjusted				
(Dollars in Thousands)							
Cost of maintenance revenue	\$ 19,208	\$ 17,408	\$ 16,821	\$ 1,800	10.3%	\$ 587	3.5%
As a percent of maintenance revenue	11.6%	10.8%	10.7%				

Cost of maintenance revenue increased by \$1.8 million during fiscal 2019 as compared to the prior fiscal year primarily due to higher headcount related costs. Cost of maintenance revenue increased by \$0.6 million during fiscal year 2018 as compared to the prior fiscal year primarily due to higher headcount related costs. Maintenance gross profit margin was 88.4% in fiscal 2019 and was consistent with 89.2% and 89.3% in fiscal years 2018 and 2017, respectively.

Cost of Services and Other Revenue

	Year Ended June 30,			2019 Compared to 2018		2018 Compared to 2017	
	2019	2018	2017	\$	%	\$	%
	As Adjusted		As Adjusted				
(Dollars in Thousands)							
Cost of services and other revenue	\$ 31,548	\$ 28,000	\$ 26,414	\$ 3,548	12.7%	\$ 1,586	6.0%
As a percent of services and other revenue	109.6%	89.6%	87.6%				

Cost of services and other revenue increased by \$3.5 million during fiscal 2019 as compared to the prior fiscal year primarily due to higher cost of professional services revenue. Cost of services and other revenue increased by \$1.6 million during fiscal 2018 as compared to the prior fiscal year primarily due to higher cost of professional services revenue. Services and other gross profit margin was (9.6)% in fiscal 2019, compared to 10.4% and 12.4% in fiscal years 2018 and 2017, respectively.

The timing of revenue and expense recognition on professional service arrangements can impact the comparability of cost and gross profit margin of professional services revenue from year to year. For example, revenue from fixed-price

engagements is recognized using the proportional performance method based on the ratio of costs incurred to the total estimated project costs.

Gross Profit

	Year Ended June 30,			2019 Compared to 2018		2018 Compared to 2017	
	2019	2018	2017	\$	%	\$	%
	As Adjusted		As Adjusted				
(Dollars in Thousands)							
Gross profit	\$ 540,529	\$ 468,215	\$ 446,961	\$ 72,314	15.4%	\$ 21,254	4.8%
As a percent of total revenue	90.3%	90.2%	90.4%				

For further discussion of subscription and software gross profit and services and other gross profit, please refer to the "Cost of License Revenue," "Cost of Maintenance Revenue," and "Cost of Services and Other Revenue" sections above.

Fiscal 2019 Compared to Fiscal 2018

Gross profit increased by \$72.3 million during fiscal 2019 as compared to the prior fiscal year and gross profit margin remained consistent at 90.3% in fiscal 2019 compared to 90.2% in fiscal 2018.

Fiscal 2018 Compared to Fiscal 2017

Gross profit increased by \$21.3 million during fiscal 2018 as compared to the prior fiscal year and gross profit margin remained consistent at 90.2% in fiscal 2018 compared to 90.4% in fiscal 2017.

Operating Expenses

Selling and Marketing Expense

	Year Ended June 30,			2019 Compared to 2018		2018 Compared to 2017	
	2019	2018	2017	\$	%	\$	%
	As Adjusted		As Adjusted				
(Dollars in Thousands)							
Selling and marketing expense	\$ 111,374	\$ 99,737	\$ 91,977	\$ 11,637	11.7%	\$ 7,760	8.4%
As a percent of total revenue	18.6%	19.2%	18.6%				

Fiscal 2019 Compared to Fiscal 2018

The year-over-year increase in selling and marketing expense in fiscal 2019 as compared to the prior fiscal year was primarily due to higher compensation costs of \$4.9 million related to an increase in headcount, higher commissions expense of \$3.8 million, higher marketing costs of \$1.2 million due to our biennial customer conference held in fiscal 2019, and higher stock-based compensation of \$1.1 million.

Fiscal 2018 Compared to Fiscal 2017

The year-over-year increase in selling and marketing expense in fiscal 2018 as compared to the prior fiscal year was primarily due to higher compensation costs of \$3.8 million related to an increase in headcount, higher commissions expense of \$2.1 million, and higher travel and sales training costs of \$1.6 million.

Research and Development Expense

	Year Ended June 30,			2019 Compared to 2018		2018 Compared to 2017	
	2019	2018	2017	\$	%	\$	%
	As Adjusted		As Adjusted				
(Dollars in Thousands)							
Research and development expense	\$ 83,122	\$ 82,076	\$ 79,530	\$ 1,046	1.3%	\$ 2,546	3.2%
As a percent of total revenue	13.9%	15.8%	16.1%				

Fiscal 2019 Compared to Fiscal 2018

The year-over-year increase in research and development expense in fiscal 2019 as compared to the prior fiscal year was primarily due to higher compensation costs of \$1.2 million related to an increase in headcount, partially offset by lower stock-based compensation of \$0.7 million.

Fiscal 2018 Compared to Fiscal 2017

The year-over-year increase in research and development expense in fiscal 2018 was primarily due to higher compensation costs of \$3.5 million related to an increase in headcount, and higher stock-based compensation of \$1.8 million, partially offset by lower acquisition and acquired technology costs of \$2.5 million.

In fiscal 2017, we acquired technology for \$2.3 million. At the time we acquired the technology, the projects to develop commercially available products did not meet the accounting definition of having reached technological feasibility and therefore the cost of the acquired technology was expensed as a research and development expense.

General and Administrative Expense

	Year Ended June 30,			2019 Compared to 2018		2018 Compared to 2017	
	2019	2018	2017	\$	%	\$	%
	As Adjusted		As Adjusted				
(Dollars in Thousands)							
General and administrative expense	\$ 63,231	\$ 67,181	\$ 58,735	\$ (3,950)	(5.9)%	\$ 8,446	14.4%
As a percent of total revenue	10.6%	12.9%	11.9%				

Fiscal 2019 Compared to Fiscal 2018

The year-over-year decrease in general and administrative expense during fiscal 2019 as compared to the prior fiscal year was primarily due to lower bad debt expense of \$9.3 million and a decrease of \$1.5 million associated with a litigation judgment in the prior period, partially offset by higher stock-based compensation of \$3.4 million and higher compensation costs of \$2.6 million related to an increase in headcount.

Fiscal 2018 Compared to Fiscal 2017

The year-over-year increase in general and administrative expense during fiscal 2018 as compared to the prior fiscal year was primarily due to higher bad debt expense of \$4.9 million, higher compensation costs of \$2.4 million related to an increase in headcount, higher stock-based compensation of \$1.9 million, and an increase in expense of \$1.7 million associated with a litigation judgment, partially offset by lower acquisition costs of \$1.4 million and lower amortization expense of \$0.9 million.

Interest Income

	Year Ended June 30,			2019 Compared to 2018		2018 Compared to 2017	
	2019	2018	2017	\$	%	\$	%
	As Adjusted		As Adjusted				
(Dollars in Thousands)							
Interest income	\$ 28,457	\$ 24,954	\$ 22,942	\$ 3,503	14.0%	\$ 2,012	8.8%
As a percent of total revenue	4.8%	4.8%	4.6%				

Fiscal 2019 Compared to Fiscal 2018

The year-over-year increase in interest income during fiscal 2019 as compared to the prior fiscal year was due to growth in the base of contracts.

Fiscal 2018 Compared to Fiscal 2017

The year-over-year increase in interest income during fiscal 2018 as compared to the prior fiscal year was due to growth in the base of contracts.

We expect interest income to continue to increase as a result of: (i) increased customer usage of our software; (ii) adding new customers; and (iii) escalating annual payments.

Interest Expense

	Year Ended June 30,			2019 Compared to 2018		2018 Compared to 2017	
	2019	2018	2017	\$	%	\$	%
	As Adjusted		As Adjusted				
(Dollars in Thousands)							
Interest expense	\$ (8,733)	\$ (5,691)	\$ (3,787)	\$ (3,042)	53.5%	\$ (1,904)	50.3%
As a percent of total revenue	(1.5)%	(1.1)%	(0.8)%				

Fiscal 2019 Compared to Fiscal 2018

The year-over-year increase in interest expense during fiscal 2019 as compared to the prior fiscal year was primarily due to interest expenses related to higher interest rates and an increase in borrowings under our Credit Agreement.

Fiscal 2018 Compared to Fiscal 2017

The year-over-year increase in interest expense during fiscal 2018 as compared to the prior fiscal year was primarily due to interest expenses related to higher interest rates and an increase in borrowings under our Credit Agreement.

Other Income (Expense), Net

	Year Ended June 30,			2019 Compared to 2018		2018 Compared to 2017	
	2019	2018	2017	\$	%	\$	%
	As Adjusted		As Adjusted				
(Dollars in Thousands)							
Other income (expense), net	\$ 664	\$ (838)	\$ 1,309	\$ 1,502	(179.2)%	\$ (2,147)	(164.0)%
As a percent of total revenue	0.1%	(0.2)%	0.3%				

Other income (expense), net is comprised primarily of unrealized and realized foreign currency exchange gains and losses generated from the settlement and remeasurement of transactions denominated in currencies other than the functional currency of our operating units. Other income (expense), net also includes miscellaneous non-operating gains and losses.

During fiscal 2019, other income (expense), net was comprised of \$0.7 million of net foreign currency exchange gains. During fiscal 2018, other income (expense), net was comprised of \$(0.8) million of net foreign currency exchange losses. During fiscal 2017, other income (expense), net was comprised of a \$0.7 million litigation related recovery receipt and other net currency gains.

Provision for Income Taxes

	Year Ended June 30,			2019 Compared to 2018		2018 Compared to 2017	
	2019	2018	2017	\$	%	\$	%
	As Adjusted		As Adjusted				
(Dollars in Thousands)							
Provision for income taxes	\$ 40,456	\$ (56,057)	\$ 57,797	\$ 96,513	(172.2)%	\$ (113,854)	(197.0)%
Effective tax rate	13.4%	(23.6)%	24.4%				

Fiscal 2019 Compared to Fiscal 2018

The effective tax rate for the periods presented is primarily the result of income earned in the U.S. taxed at U.S. federal and state statutory income tax rates, income earned in foreign tax jurisdictions taxed at the applicable rates, as well as the impact of permanent differences between book and tax income.

On December 22, 2017, the President of the United States signed into law Public Law No. 115-97, commonly referred to as the Tax Cuts and Jobs Act (the "Tax Act"), following its passage by the United States Congress. The Tax Act made significant changes to U.S. federal income tax laws, including reduction of the corporate tax rate from 35.0% to 21.0%, and the implementation of a territorial tax system resulting in a one-time transition tax on the unremitted earnings of our foreign subsidiaries. The Tax Act also contains additional provisions that are effective for us in fiscal year 2019, including a new

deduction for Foreign-Derived Intangible Income ("FDII"), the repeal of the domestic production activity deduction, a new tax on Global Intangible Low-Taxed Income ("GILTI"), and increased limitations on the deductibility of certain executive compensation.

Under U.S. GAAP, we are allowed to make an accounting policy choice to either (i) treat 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 (ii) factor in such amounts into the measurement of our deferred taxes (the "deferred method"). Our selection of an accounting policy related to the GILTI tax provisions depends, in part, on analyzing our global income to determine whether we expect to have future U.S. inclusions in taxable income related to GILTI and, if so, what the impact is expected to be. While our future global operations depend on a number of different factors, we do expect to have future U.S. inclusions in taxable income related to GILTI. Further, we have made a policy decision to record GILTI tax as a current-period expense when incurred. We expect to continue to account for the tax on GILTI as a period cost and therefore has not adjusted any of the deferred tax assets and liabilities of its foreign subsidiaries in connection with the Tax Act.

The Tax Act has several significant changes that impact all taxpayers, including a transition tax, which is a one-time tax charge on accumulated, undistributed foreign earnings. The calculation of accumulated foreign earnings requires an analysis of each foreign entity's financial results going back to 1986. We have concluded that we will not be subject to the transition tax associated with our accumulated, undistributed foreign earnings. We do not provide deferred taxes on unremitted earnings of our foreign subsidiaries as we intend to indefinitely reinvest those earnings.

Our effective tax rate was 13.4% and (23.6)% during fiscal 2019 and 2018, respectively.

We recognized income tax expense of \$40.5 million during fiscal 2019 compared to a tax benefit of \$(56.1) million during fiscal 2018. Fiscal 2019 was favorably impacted by the FDII deduction, the recognition of excess tax benefits related to stock-based compensation and the lower U.S. statutory tax rate of 21.0% as a result of the enactment of the Tax Act discussed above. Assuming certain requirements are met, the FDII deduction is a benefit for US companies that sell their products or services to customers outside the US. Fiscal 2018 was favorably impacted by the revaluation of our deferred income tax liabilities using the reduced corporate income tax rate as the result of the Tax Act, recognition of excess tax benefits related to stock-based compensation and the domestic production activity deduction.

As of June 30, 2019, we maintained a valuation allowance in the U.S. primarily for certain deferred tax assets related to the investment in a joint venture. We also maintain a valuation allowance on certain foreign subsidiary net operating loss carryforwards and state research and development ("R&D") credits because it is more likely than not that a benefit will not be realized. During fiscal 2019, we released a valuation allowance for the deferred tax assets related to capital losses that expired unused. As of June 30, 2019 and 2018, our total valuation allowance was \$4.9 million and \$10.4 million, respectively.

We made cash tax payments totaling \$53.2 million during fiscal 2019. We paid \$44.5 million for U.S. federal and state income taxes and \$8.7 million for foreign tax liabilities.

Fiscal 2018 Compared to Fiscal 2017

The effective tax rate for the periods presented is primarily the result of income earned in the U.S. taxed at U.S. federal and state statutory income tax rates, income earned in foreign tax jurisdictions taxed at the applicable rates, as well as the impact of permanent differences between book and tax income.

Our effective tax rate was (23.6)% and 24.4% during fiscal 2018 and 2017, respectively.

Our effective tax rate decreased in fiscal 2018 compared to the same period in 2017 due to the tax benefit recorded during fiscal 2018 for the revaluation of our deferred tax liabilities of approximately \$115.5 million as the result of the Tax Act using the reduced corporate income tax rate from 35% to a blended tax rate of 28.1%, recognition of excess tax benefits related to stock-based compensation and the domestic production activity deduction. Fiscal 2017 was favorably impacted primarily by an income tax benefit of \$19.1 million resulted from the release of tax contingency reserves following an examination of our fiscal 2015 federal tax return by the IRS.

As of June 30, 2018, we maintained a valuation allowance in the U.S. primarily for certain deferred tax assets related to capital losses that are anticipated to expire unused. We also maintain a valuation allowance on certain foreign subsidiary net operating loss carryforwards and state R&D credits because it is more likely than not that a benefit will not be realized. As of June 30, 2018 and 2017, our total valuation allowance was \$10.4 million and \$11.3 million, respectively.

We made cash tax payments totaling \$50.6 million during fiscal 2018. We paid \$44.0 million for U.S. federal and state income taxes and \$6.6 million for foreign tax liabilities.

Liquidity and Capital Resources

Resources

In recent years, we have financed our operations with cash generated from operating activities. As of June 30, 2019 and 2018, our principal sources of liquidity consisted of \$71.9 million and \$96.2 million in cash and cash equivalents, respectively.

We believe our existing cash and cash equivalents, together with our cash flows from operating activities, will be sufficient to meet our anticipated cash needs for at least the next twelve months. We may need to raise additional funds if we decide to make one or more acquisitions of businesses, technologies or products. If additional funding for such purposes is required beyond existing resources and our Credit Agreement described below, we may not be able to effect a receivable, equity or debt financing on terms acceptable to us or at all.

Credit Agreement

On February 26, 2016, we entered into a \$250.0 million Credit Agreement (the "Credit Agreement") with JPMorgan Chase Bank, N.A., as administrative agent, Silicon Valley Bank, as syndication agent, and the lenders and other parties named therein (the "Lenders"). On August 9, 2017, we entered into an Amendment to increase the Credit Agreement to \$350.0 million. The indebtedness evidenced by the Credit Agreement matures on February 26, 2021. Prior to the maturity of the Credit Agreement, any amounts borrowed may be repaid and, subject to the terms and conditions of the Credit Agreement, borrowed again in whole or in part without penalty. We had \$220.0 million and \$170.0 million in outstanding borrowings under the Credit Agreement as of June 30, 2019 and 2018, respectively.

For a more detailed description of the Credit Agreement, refer to Note 11, "Credit Agreement," to our Consolidated Financial Statements.

Cash Equivalents and Cash Flows

Our cash equivalents of \$1.0 million and \$5.0 million as of June 30, 2019 and 2018, respectively, consisted of money market funds. The objective of our investment policy is to manage our cash and investments to preserve principal and maintain liquidity.

The following table summarizes our cash flow activities for the periods indicated:

	Year Ended June 30,		
	2019	2018	2017
	(Dollars in Thousands)		
Cash flow provided by (used in):			
Operating activities	\$ 238,313	\$ 206,936	\$ 182,386
Investing activities	(7,665)	(34,360)	(36,698)
Financing activities	(254,527)	(178,479)	(362,017)
Effect of exchange rates on cash balances	(360)	114	(53)
Decrease in cash and cash equivalents	<u>\$ (24,239)</u>	<u>\$ (5,789)</u>	<u>\$ (216,382)</u>

Operating Activities

Our primary source of cash is from the annual installments associated with our software license arrangements and related software support services, and to a lesser extent from professional services and training. We believe that cash inflows from our term license business will grow as we benefit from the continued growth of our portfolio of term license contracts.

Fiscal 2019

Cash from operating activities provided \$238.3 million during fiscal 2019. This amount resulted from net income of \$262.7 million, adjusted for non-cash items of \$8.7 million, and net uses of cash of \$(33.1) million related to changes in working capital.

Non-cash items within net income consisted primarily of stock-based compensation expense of \$27.6 million, depreciation and amortization expense of \$8.1 million, deferred income taxes of \$(26.8) million, provision for bad debts of \$0.6 million, and net foreign currency gains of \$(1.3) million.

Cash used by working capital of \$(33.1) million was primarily attributable to cash used by increases in contract assets of \$59.3 million, increases in accounts receivable of \$6.6 million, increases in contract costs of \$4.5 million, and increases in prepaid expenses, prepaid income taxes, and other assets of \$2.4 million, partially offset by cash provided by increases in accounts payable, accrued expenses and other current liabilities of \$21.9 million, and increases in deferred revenue of \$17.8 million. The increase in accounts payable, accrued expenses and other current liabilities is primarily due to an increase in income taxes payable as of June 30, 2019 from the tax liability associated with adopting Topic 606. There was a correlating decrease in deferred income taxes during fiscal 2019.

Fiscal 2018

Cash from operating activities provided \$206.9 million during fiscal 2018. This amount resulted from net income of \$293.7 million, adjusted for non-cash items of \$(78.3) million, and net uses of cash of \$(8.5) million related to changes in working capital.

Non-cash items within net income consisted primarily of stock-based compensation expense of \$22.7 million, depreciation and amortization expense of \$6.5 million, deferred income taxes of \$(110.3) million, provision for bad debts of \$1.4 million, and net foreign currency losses of \$1.0 million.

Cash used by working capital of \$(8.5) million was primarily attributable to cash used by decreases in deferred revenue of \$17.4 million and increases in contract costs of \$0.6 million, partially offset by cash provided by decreases in accounts receivable of \$0.8 million, decreases in prepaid expenses, prepaid income taxes, and other assets of \$3.8 million, decreases in contract assets of \$3.6 million, and increases in accounts payable, accrued expenses and other current liabilities of \$1.2 million.

Fiscal 2017

Cash from operating activities provided \$182.4 million during fiscal 2017. This amount resulted from net income of \$179.4 million, adjusted for non-cash items of \$30.2 million, and net sources of cash of \$(27.2) million related to changes in working capital.

Non-cash items within net income consisted primarily of stock-based compensation expense of \$18.8 million, depreciation and amortization expense of \$6.4 million, deferred income taxes of \$5.3 million, net foreign currency gains of \$(1.0) million, and provision for bad debts of \$0.2 million,

Cash used by working capital of \$(27.2) million was primarily attributable to cash used by increases in accounts receivable of \$8.2 million, increases in contract assets of \$4.3 million, decreases in deferred revenue of \$3.1 million, increases in contract costs of \$0.2 million, increases in prepaid expenses, prepaid income taxes, and other assets of \$2.4 million, and decreases in accounts payable, accrued expenses and other current liabilities of \$9.1 million.

Investing Activities

Fiscal 2019

During fiscal 2019, we used \$7.7 million of cash from investing activities. We used \$6.1 million for business acquisitions, \$1.1 million for capitalized computer software development costs, and \$0.4 million for capital expenditures.

Fiscal 2018

During fiscal 2018, we used \$34.4 million of cash from investing activities. We used \$33.7 million for business acquisitions, \$0.3 million for capitalized computer software development costs, and \$0.3 million for capital expenditures.

Fiscal 2017

During fiscal 2017, we used \$36.7 million of cash from investing activities. We used \$683.7 million for purchases of marketable securities, \$36.2 million for business acquisitions, \$2.7 million for capital expenditures, and \$0.4 million for capitalized computer software development costs, partially offset by \$686.3 million for maturities of marketable securities.

Financing Activities

Fiscal 2019

During fiscal 2019, we used \$254.5 million of cash for financing activities. We used \$299.2 million for repurchases of our common stock, \$1.7 million for deferred business acquisition payments, and \$14.5 million for withholding taxes on vested

and settled restricted stock units. Sources of cash in the period included proceeds of \$50.0 million from the Credit Agreement and proceeds of \$10.9 million from the exercise of employee stock options.

Fiscal 2018

During fiscal 2018, we used \$178.5 million of cash for financing activities. We used \$205.0 million for repurchases of our common stock, \$8.6 million for deferred business acquisition payments, \$7.9 million for withholding taxes on vested and settled restricted stock units, and \$0.4 million for issuance costs related to our Credit Agreement. Sources of cash in the period included proceeds of \$30.0 million from the Credit Agreement and proceeds of \$13.5 million from the exercise of employee stock options.

Fiscal 2017

During fiscal 2017, we used \$362.0 million of cash for financing activities. We used \$371.5 million for repurchases of our common stock and \$5.8 million for withholding taxes on vested and settled restricted stock units, partially offset by proceeds of \$9.3 million from the exercise of employee stock options and \$6.0 million from excess tax benefits from stock-based compensation.

Contractual Obligations and Requirements

Our contractual obligations consisted primarily of borrowings and interest under our Credit Agreement, operating lease commitments for our headquarters and other facilities, royalty and other obligations and were as follows as of June 30, 2019:

	Payments due by Period				
	Total	Less than 1 Year	1 to 3 Years	3 to 5 Years	More than 5 Years
<i>Contractual Cash Obligations:</i>					
Credit agreement (1)	\$ 229,028	\$ 229,028	\$ —	\$ —	\$ —
Operating leases	36,834	8,399	14,334	10,794	3,307
Royalty obligations	5,522	3,967	870	233	452
Deferred acquisition payments	6,124	4,600	1,524	—	—
Other purchase obligations	18,254	12,667	3,825	1,496	266
Total contractual cash obligations	\$ 295,762	\$ 258,661	\$ 20,553	\$ 12,523	\$ 4,025
<i>Other Commercial Commitments:</i>					
Standby letters of credit	\$ 3,934	\$ 3,202	\$ 464	\$ —	\$ 268
Total commercial commitments	\$ 299,696	\$ 261,863	\$ 21,017	\$ 12,523	\$ 4,293

(1) The \$229.0 million contractual obligation related to our Credit Agreement includes \$220.0 million in outstanding borrowings and \$9.0 million of interest expense and commitment fees as of June 30, 2019.

Except for the commitments under the aforementioned lease agreement, we are not currently a party to any other material purchase contracts related to future capital expenditures, and we do not expect our future investment in capital expenditures to be materially different from recent levels.

The standby letters of credit were issued by Silicon Valley Bank in the United States and secure our performance on professional services contracts and certain facility leases.

The above table does not reflect a liability for uncertain tax positions of \$5.4 million as of June 30, 2019. We estimate that none of this amount will be paid within the next year and we are currently unable to reasonably estimate the timing of payments for the remainder of the liability.

Off-Balance Sheet Arrangements

As of June 30, 2019, we did not have any significant off-balance sheet arrangements, as defined in Item 303(a)(4)(ii) of SEC Regulation S-K.

Critical Accounting Estimates and Judgments

Our consolidated financial statements are prepared in accordance with GAAP. The preparation of our financial statements requires management to make estimates and judgments that affect the reported amounts of assets, liabilities, revenue, expenses and related disclosures. We base our estimates on historical experience and various other assumptions that we believe to be 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 under different assumptions or conditions.

We believe that the assumptions and estimates associated with revenue recognition policies have the greatest potential impact on our consolidated financial statements.

Our accounting policies for revenue recognition were updated as a result of adopting Topic 606. For further information on our significant accounting policies, refer to Note 2, "Significant Accounting Policies," and Note 3, "Revenue from Contracts with Customers," to our Consolidated Financial Statements.

Revenue Recognition

In accordance with Topic 606, we account for a customer contract when both parties have approved the contract and are committed to perform their respective obligations, each party's rights can be identified, payment terms can be identified, the contract has commercial substance, and it is probable that we will collect substantially all of the consideration to which we are entitled. Revenue is recognized when, or as, performance obligations are satisfied by transferring control of a promised product or service to a customer.

Nature of Products and Services

We generate revenue from the following sources: (1) License revenue; (2) Maintenance revenue; and (3) Services and other revenue. We sell our software products to end users primarily under fixed-term licenses. We license our software products primarily through a subscription offering which we refer to as our aspenONE licensing model, which includes software maintenance and support, known as our Premier Plus SMS offering, for the entire term. Our aspenONE products are organized into three suites: 1) engineering; 2) manufacturing and supply chain; and 3) asset performance management. The aspenONE licensing model provides customers with access to all of the products within the aspenONE suite(s) they license. We refer to these arrangements as token arrangements. Tokens are fixed units of measure. The amount of software usage is limited by the number of tokens purchased by the customer.

We also license our software through point product term arrangements, which include our Premier Plus SMS offering for the entire term.

We determine revenue recognition through the following steps:

- Identification of the contract, or contracts, with a customer;
- Identification of the performance obligations in the contract;
- Determination of the transaction price;
- Allocation of the transaction price to the performance obligations in the contract; and
- Recognition of revenue when, or as, we satisfy a performance obligation.

Term-based Arrangements: Term-based arrangements consist of on-premise term licenses as well as maintenance.

License

License revenue consists primarily of product and related revenue from our aspenONE licensing model and point product arrangements.

When a customer elects to license our products under our aspenONE licensing model, the customer receives, for the term of the arrangement, the right to all software products in the licensed aspenONE software suite. When a customer elects to license point products, the customer receives, for the term of the arrangement, the right to license specified products in the licensed aspenONE software suite. Revenue from initial product licenses is recognized upfront upon delivery.

Maintenance

When a customer elects to license our products under our aspenONE licensing model, our Premier Plus SMS offering is included for the entire term of the arrangement and the customer receives, for the term of the arrangement, the right to any updates that may be introduced into the licensed aspenONE software suite. When a customer elects to license point products, our Premier Plus SMS offering is included for the entire term of the arrangement and the customer receives, for the term of the arrangement, the right to any updates that may be introduced related to the specified products licensed. Maintenance represents a stand-ready obligation and, due to our obligation to provide unspecified future software updates on a when-and-if available basis as well as telephone support services, we are required to recognize revenue ratably over the term of the arrangement.

Services and Other Revenue

Professional Services Revenue

Professional services are provided to customers on a T&M or fixed-price basis. The obligation to provide professional services is generally satisfied over time, with the customer simultaneously receiving and consuming the benefits as we satisfy our performance obligation. For professional services, revenue is recognized by measuring progress toward the completion of our obligations. We recognize professional services fees for our T&M contracts based upon hours worked and contractually agreed-upon hourly rates. Revenue from fixed-price engagements is recognized using the proportional performance method based on the ratio of costs incurred to the total estimated project costs. The use of the proportional performance method is dependent upon our ability to reliably estimate the costs to complete a project. We use historical experience as a basis for future estimates to complete current projects. Additionally, we believe that costs are the best available measure of performance. Out-of-pocket expenses which are reimbursed by customers are recorded as revenue.

Training Revenue

We provide training services to our customers, including on-site, Internet-based, public and customized training. The obligation to provide training services is generally satisfied over time, with the customer simultaneously receiving and consuming the benefits as we satisfy our performance obligation. Revenue is recognized in the period in which the services are performed.

Contracts with Multiple Performance Obligations

Our contracts generally contain more than one of the products and services listed above, each of which is separately accounted for as a distinct performance obligation.

Allocation of consideration: We allocate total contract consideration to each distinct performance obligation in an arrangement on a relative standalone selling price basis. The standalone selling price reflects the price we would charge for a specific product or service if it was sold separately in similar circumstances and to similar customers.

If the arrangement contains professional services and other products or services, we allocate to the professional service obligation a portion of the total contract consideration based on the standalone selling price of professional services that is observed from consistently priced standalone sales.

The standalone selling price for term licenses, which are always sold with maintenance, is the price for the combined license and maintenance bundle. The amount assigned to the license and maintenance bundle is separated into license and maintenance amounts using the respective standalone selling prices represented by the value relationship between the software license and maintenance.

When two or more contracts are entered into at or near the same time with the same customer, we evaluate the facts and circumstances associated with the negotiation of those contracts. Where the contracts are negotiated as a package, we will account for them as a single arrangement and allocate the consideration for the combined contracts among the performance obligations accordingly.

Standalone selling price: When available, we use directly observable transactions to determine the standalone selling prices for performance obligations. Generally, directly observable data is not available for term licenses and maintenance. When term licenses are sold together with maintenance in a bundled arrangement, we estimate a standalone selling price for these distinct performance obligations using relevant information, including our overall pricing objectives and strategies and historical pricing data, and taking into consideration market conditions and other factors.

Other policies and judgments

Payment terms and conditions vary by contract type, although terms generally include a requirement of payment annually over the term of the license arrangement. Therefore, we generally receive payment from a customer after the performance obligation related to the license has been satisfied, and therefore, our contracts generally contain a significant financing component. The significant financing component is calculated utilizing an interest rate that derives the net present value of the performance obligations delivered on an upfront basis based on the allocation of consideration. We have instituted a customer portfolio approach in assigning interest rates. The rates are determined at contract inception and are based on the credit characteristics of the customers within each portfolio.

Contract modifications

We sometimes enter into agreements to modify previously executed contracts, which constitute contract modifications. We assess each of these contract modifications to determine (i) if the additional products and services are distinct from the products and services in the original arrangement; and (ii) if the amount of consideration expected for the added products and services reflects the stand-alone selling price of those products and services, as adjusted for contract-specific circumstances. A contract modification meeting both criteria is accounted for as a separate contract. A contract modification not meeting both criteria is considered a change to the original contract and is accounted for on either (i) a prospective basis as a termination of the existing contract and the creation of a new contract; or (ii) a cumulative catch-up basis. Generally, our contract modifications meet both criteria and are accounted for as a separate contract, as adjusted for contract-specific circumstances.

Contract Costs

We pay commissions for new product sales as well as for renewals of existing contracts. Commissions paid to obtain renewal contracts are not commensurate with the commissions paid for new product sales and therefore, a portion of the commissions paid for new contracts relate to future renewals.

We account for new product sales commissions using a portfolio approach and allocate the cost of commissions in proportion to the allocation of transaction price of license and maintenance performance obligations, including assumed renewals. Commissions allocated to the license and license renewal components are expensed at the time the license revenue is recognized. Commissions allocated to maintenance are capitalized and amortized on a straight-line basis over a period of four to eight years for new contracts, reflecting our estimate of the expected period that we will benefit from those commissions.

Amortization of capitalized contract costs is included in sales and marketing expenses in our Condensed Consolidated Statement of Operations.

Recent Accounting Pronouncements

Refer to Note 2 (n) "New Accounting Pronouncements Adopted in Fiscal 2019" and Note 2 (o) "Recently Issued Accounting Pronouncements," to our Consolidated Financial Statements for information about recent accounting pronouncements.

Item 7A. Quantitative and Qualitative Disclosures about Market Risk.

In the ordinary course of conducting business, we are exposed to certain risks associated with potential changes in market conditions. These market risks include changes in currency exchange rates and interest rates which could affect operating results, financial position and cash flows. We manage our exposure to these market risks through our regular operating and financing activities and, if considered appropriate, we may enter into derivative financial instruments such as forward currency exchange contracts.

Foreign Currency Risk

During fiscal 2019 and 2018, 10.2% and 9.1% of our total revenue was denominated in a currency other than the U.S. dollar. In addition, certain of our operating costs incurred outside the United States are denominated in currencies other than the U.S. dollar. We conduct business on a worldwide basis and as a result, a portion of our revenue, earnings, net assets, and net investments in foreign affiliates is exposed to changes in foreign currency exchange rates. We measure our net exposure for cash balance positions and for cash inflows and outflows in order to evaluate the need to mitigate our foreign exchange risk. We may enter into foreign currency forward contracts to minimize the impact related to unfavorable exchange rate movements,

although we have not done so during fiscal 2019 and fiscal 2018. Our largest exposures to foreign currency exchange rates exist primarily with the Euro, Pound Sterling, Canadian Dollar, and Japanese Yen.

During fiscal 2019 and fiscal 2018, we recorded net foreign currency gains of \$0.7 million and losses of \$(0.8) million, respectively, related to the settlement and remeasurement of transactions denominated in currencies other than the functional currency of our operating units. Our analysis of operating results transacted in various foreign currencies indicated that a hypothetical 10% change in the foreign currency exchange rates could have increased or decreased the consolidated results of operations by approximately \$4.8 million for fiscal 2019 and 2018.

Interest Rate Risk

We place our investments in money market instruments. Our analysis of our investments and interest rates at June 30, 2019 and 2018 indicated that a hypothetical 100 basis point increase or decrease in interest rates would not have a material impact on the fair value of our investments determined in accordance with an income-based approach utilizing portfolio future cash flows discounted at the appropriate rates.

We had \$220.0 million in outstanding borrowings under our Credit Agreement as of June 30, 2019. A hypothetical 10% increase or decrease in interest rates paid on outstanding borrowings under the Credit Agreement would not have a material impact on our financial position, results of operations or cash flows.

Item 8. Financial Statements and Supplementary Data.

The following consolidated financial statements specified by this Item, together with the reports thereon of KPMG LLP, are presented following Item 15 of this Form 10-K:

Financial Statements:

- Report of Independent Registered Public Accounting Firm
- Consolidated Statements of Operations for the years ended June 30, 2019, 2018 and 2017
- Consolidated Statements of Comprehensive Income for the years ended June 30, 2019, 2018 and 2017
- Consolidated Balance Sheets as of June 30, 2019 and 2018
- Consolidated Statements of Stockholders' Equity for the years ended June 30, 2019, 2018 and 2017
- Consolidated Statements of Cash Flows for the years ended June 30, 2019, 2018 and 2017
- Notes to Consolidated Financial Statements

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 Rule 13a-15(b) under the Securities Exchange Act of 1934, as amended, or Exchange Act, as of the end of the period covered by this report, we carried out an evaluation under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, of the effectiveness of our disclosure controls and procedures. In designing and evaluating our disclosure controls and procedures, we recognize that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives, and our management necessarily applies its judgment in evaluating and implementing possible controls and procedures. The effectiveness of our disclosure controls and procedures is also necessarily limited by the staff and other resources available to us and the geographic diversity of our operations. Based upon that evaluation, the Chief Executive Officer and Chief Financial Officer concluded that, as of the end of the period covered by this report, our disclosure controls and procedures were not effective due to a material weakness in internal control over financial reporting discussed below in Management's Annual Report on Internal Control Over Financial Reporting.

Management's Annual Report on Internal Control Over Financial Reporting

Management of the Company is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rules 13a-15(f) and 15d-15(f) under the Securities Exchange Act of 1934. The Company's internal control over financial reporting is 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. The Company's internal control over financial reporting includes those policies and procedures that:

- (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the Company;
- (ii) 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
- (iii) 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.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of our annual or interim financial statements will not be prevented or detected on a timely basis.

Management, including our Chief Executive Officer and Chief Financial Officer, assessed the effectiveness of the Company's internal control over financial reporting as of June 30, 2019. In making this assessment, management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in Internal Control-Integrated Framework (2013). Based on this assessment, management has concluded that our internal control over financial reporting was not effective as of June 30, 2019, due to the material weakness in our internal control over financial reporting discussed below.

We did not effectively design process level control activities over the accuracy of the retrospective restatement of revenue and related contract balances recorded upon the adoption of ASC Topic 606, and the classification of contract cost assets and related deferred tax assets and liabilities on the consolidated balance sheet. The control deficiencies identified resulted from an ineffective risk assessment and the lack of timely creation of relevant reporting tools and information used to support the functioning of internal control. These deficiencies created a reasonable possibility that a material misstatement would not have been prevented or detected on a timely basis and accordingly management concluded that the deficiencies represent a material weakness in our internal control over financial reporting.

The material weakness resulted in material misstatements affecting the transition adjustment and recording of revenue upon the adoption of ASC Topic 606, and the classification of contract cost assets and related deferred tax assets and liabilities as reported in previously issued unaudited consolidated financial statements in our quarterly reports on Form 10-Q. These misstatements are described in Note 19, "Quarterly Financial Data (Unaudited)," to our audited Consolidated Financial Statements in this Form 10-K, and such balances have been restated in this Form 10-K.

The independent registered public accounting firm that audited the Company's consolidated financial statements included elsewhere in this Annual Report on Form 10-K has issued an adverse opinion on the effectiveness of the Company's internal control over financial reporting. That report appears immediately following this report.

Changes in Internal Control Over Financial Reporting

Except for the matter discussed above that has been assessed as a material weakness as of June 30, 2019, there were no changes in our internal control over financial reporting that occurred during the quarter ended June 30, 2019, that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting. We will continue to review and document our disclosure controls and procedures, including our internal control over financial reporting, and may from time to time make changes aimed at enhancing their effectiveness and to ensure that our systems evolve with our business.

Remediation

Management has begun implementing a remediation plan to address the material weakness. The remediation plan includes enhancing our risk assessment process over the design and implementation of internal controls included in new and emerging financial reporting matters, utilizing appropriate reporting tools and information recently created in support of the operation of the control activities, and operating enhanced and additional reconciliation and review controls over the accounting for revenue contracts under ASC Topic 606. Based on certain outcomes of future risk assessments, we may involve external experts to assist in the design of process level control activities.

We currently plan to have our enhanced risk assessment process in place and operating in the first quarter of fiscal 2020. Our goal is to remediate this material weakness by the end of fiscal 2020.

Report of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors
Aspen Technology, Inc.:

Opinion on Internal Control Over Financial Reporting

We have audited Aspen Technology, Inc. and subsidiaries' (the Company) internal control over financial reporting as of June 30, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. In our opinion, because of the effect of the material weakness, described below, on the achievement of the objectives of the control criteria, the Company has not maintained effective internal control over financial reporting as of June 30, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of June 30, 2019 and 2018, the related consolidated statements of operations, comprehensive income, stockholders' equity, and cash flows for each of the years in the three-year period ended June 30, 2019, and the related notes and financial statement Schedule II- Valuation and Qualifying Accounts (collectively, the consolidated financial statements), and our report dated September 10, 2019 expressed an unqualified opinion on those consolidated financial statements.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the company's annual or interim financial statements will not be prevented or detected on a timely basis. A material weakness has been identified and included in management's assessment related to the ineffective design and implementation of control activities over the accuracy of the retrospective restatement of revenue and related contract balances recorded upon the adoption of ASC Topic 606, and the classification of contract cost assets and related deferred tax assets and liabilities on the consolidated balance sheet. The material weakness described above resulted from an ineffective risk assessment and the lack of timely creation of relevant reporting tools and information used to support the functioning of internal control. The material weakness was considered in determining the nature, timing, and extent of audit tests applied in our audit of the fiscal 2019 consolidated financial statements, and this report does not affect our report on those consolidated 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 Annual 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 of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included 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/ KPMG LLP

Boston, Massachusetts
September 10, 2019

Item 9B. Other Information.

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

Certain information required under this Item 10 will appear under the sections entitled “Executive Officers of the Registrant,” “Election of Directors,” “Information Regarding our Board of Directors and Corporate Governance,” “Code of Business Conduct and Ethics,” and “Section 16(a) Beneficial Ownership Reporting Compliance” in our definitive proxy statement for our 2019 annual meeting of stockholders, and is incorporated herein by reference.

Item 11. Executive Compensation.

Certain information required under this Item 11 will appear under the sections entitled “Director Compensation,” “Compensation Discussion and Analysis,” “Executive Compensation” and “Employment and Change in Control Agreements” in our definitive proxy statement for our 2019 annual meeting of stockholders, and is incorporated herein by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

Certain information required under this Item 12 will appear under the sections entitled “Stock Owned by Directors, Executive Officers and Greater-than 5% Stockholders” and “Securities Authorized for Issuance Under Equity Compensation Plans” in our definitive proxy statement for our 2019 annual meeting of stockholders, and is incorporated herein by reference.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

Certain information required under this Item 13 will appear under the sections entitled “Information Regarding the Board of Directors and Corporate Governance” and “Related Party Transactions” in our definitive proxy statement for our 2019 annual meeting of stockholders, and is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services.

Certain information required under this Item 14 will appear under the section entitled “Independent Registered Public Accountants” in our definitive proxy statement for our 2019 annual meeting of stockholders, and is incorporated herein by reference.

PART IV**Item 15. Exhibits and Financial Statement Schedules.****(a)(1) Financial Statements**

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The consolidated financial statements appear immediately following page 50 ("Signatures").

(a)(2) Financial Statement Schedules

Schedule II-Valuation and Qualifying Accounts for the years ended June 30, 2019, 2018 and 2017 appears immediately following the financial statements. All other schedules are omitted because they are not required or the required information is shown in the consolidated financial statements or notes thereto.

(a)(3) Exhibits

The exhibits listed in the accompanying exhibit index are filed or incorporated by reference as part of this Form 10-K.

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Report of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors
Aspen Technology, Inc.:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Aspen Technology, Inc. and subsidiaries (the Company) as of June 30, 2019 and 2018, the related consolidated statements of operations, comprehensive income, stockholders' equity, and cash flows for each of the years in the three-year period ended June 30, 2019, and the related notes and financial statement Schedule II - Valuation and Qualifying Accounts, (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of June 30, 2019 and 2018, and the results of its operations and its cash flows for each of the years in the three-year period ended June 30, 2019, in conformity with U.S. generally accepted accounting principles.

We also have 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 June 30, 2019, 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 September 10, 2019 expressed an adverse opinion on the effectiveness of the Company's internal control over financial reporting.

Change in Accounting Principle

As discussed in Note 2 to the consolidated financial statements, the Company has changed its method of accounting for revenues and certain contract costs in fiscal 2019, 2018, and 2017 due to the adoption of Accounting Standards Update 2014-09, *Revenue from Contracts with Customers* (Topic 606).

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated 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 consolidated 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 consolidated 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 consolidated 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 consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the consolidated financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of the critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Determination of Standalone Selling Prices for Term License and Maintenance Performance Obligations

As discussed in Note 3 to the consolidated financial statements, the Company recognized term license revenue and maintenance revenue of \$404.1 million and \$165.4 million, respectively, for the year ended June 30, 2019. The Company allocates the transaction price to each distinct performance obligation on a relative standalone selling price basis. For term license and maintenance performance obligations, directly observable data is generally not available, which requires the Company to make significant assumptions regarding the relative fair value of the related performance obligations.

We identified the determination of standalone selling prices for term license and maintenance performance obligations as a critical audit matter. There is a high degree of subjective auditor judgment involved in performing procedures on the Company's assumptions, since there is no direct observable data available.

The primary procedures we performed to address this critical audit matter included the following. We tested certain internal controls over the Company's revenue process, including controls over the development of standalone selling prices. We evaluated the information used by the Company to determine standalone selling prices by comparing it to external sources, such as available information regarding industry pricing practices, and internal data, including the Company's pricing practices.

Evaluation of Historical Customer Contract Modifications as a Result of the Adoption of Topic 606

As discussed in Notes 2(n) and 3 to the consolidated financial statements, the Company adopted Topic 606 effective July 1, 2018 using the full retrospective method. The Company recast previously reported revenue and related balance sheet accounts for all periods presented. Significant judgment was exercised by the Company in determining the retrospective recasting for historical customer contract modifications.

We identified the evaluation of the retrospective recasting of historical customer contract modifications as a result of the adoption of Topic 606 as a critical audit matter. Due to the nature and extent of historical customer contract modifications and the material weakness identified, the evaluation of the recast of previously reported revenue and related balance sheet accounts required a high degree of auditor judgment.

The primary procedures we performed to address this critical audit matter included the following. We selected a sample of contracts to determine whether contract modifications were properly identified by the Company. For a sample of customer contracts and the related modifications, we obtained and read source documents to evaluate the significant terms of the contracts, and evaluated the Company's determination of recasted revenue recognition and the related balance sheet accounts under Topic 606.

/s/ KPMG LLP

We have served as the Company's auditor since 2008.

Boston, Massachusetts

September 10, 2019

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF OPERATIONS

	Year Ended June 30,		
	2019	2018	2017
	As Adjusted		As Adjusted
	(Dollars in Thousands, Except per Share Data)		
Revenue:			
License	\$ 404,122	\$ 326,549	\$ 307,259
Maintenance	165,436	161,065	157,012
Services and other	28,787	31,245	30,156
Total revenue	598,345	518,859	494,427
Cost of revenue:			
License	7,060	5,236	4,231
Maintenance	19,208	17,408	16,821
Services and other	31,548	28,000	26,414
Total cost of revenue	57,816	50,644	47,466
Gross profit	540,529	468,215	446,961
Operating expenses:			
Selling and marketing	111,374	99,737	91,977
Research and development	83,122	82,076	79,530
General and administrative	63,231	67,181	58,735
Total operating expenses	257,727	248,994	230,242
Income from operations	282,802	219,221	216,719
Interest income	28,457	24,954	22,942
Interest (expense)	(8,733)	(5,691)	(3,787)
Other income (expense), net	664	(838)	1,309
Income before income taxes	303,190	237,646	237,183
Provision for (benefit from) income taxes	40,456	(56,057)	57,797
Net income	\$ 262,734	\$ 293,703	\$ 179,386
Net income per common share:			
Basic	\$ 3.76	\$ 4.07	\$ 2.35
Diluted	\$ 3.71	\$ 4.03	\$ 2.33
Weighted average shares outstanding:			
Basic	69,925	72,140	76,491
Diluted	70,787	72,956	76,978

See accompanying notes to these consolidated financial statements.

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

	Year Ended June 30,		
	2019	2018	2017
		As Adjusted	As Adjusted
		(Dollars in Thousands)	
Net income	\$ 262,734	\$ 293,703	\$ 179,386
Other comprehensive loss:			
Foreign currency translation adjustments	(1,052)	(71)	(1,192)
Total other comprehensive loss	(1,052)	(71)	(1,192)
Comprehensive income	\$ 261,682	\$ 293,632	\$ 178,194

See accompanying notes to these consolidated financial statements.

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEETS

	June 30,	
	2019	2018
	As Restated	
	(Dollars in Thousands, Except Share and Per Share Data)	
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 71,926	\$ 96,165
Accounts receivable, net	47,784	41,810
Current contract assets	294,193	237,537
Prepaid expenses and other current assets	12,628	10,509
Prepaid income taxes	2,509	2,601
Total current assets	429,040	388,622
Property, equipment and leasehold improvements, net	7,234	9,806
Computer software development costs, net	1,306	646
Goodwill	78,383	75,590
Intangible assets, net	33,607	35,310
Non-current contract assets	325,510	319,840
Contract costs	24,982	20,500
Non-current deferred tax assets	1,669	1,232
Other non-current assets	1,334	1,297
Total assets	<u>\$ 903,065</u>	<u>\$ 852,843</u>
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	\$ 5,891	\$ 4,230
Accrued expenses and other current liabilities	54,594	39,515
Income taxes payable	14,952	1,698
Borrowings under credit agreement	220,000	170,000
Current deferred revenue	25,318	15,150
Total current liabilities	320,755	230,593
Non-current deferred revenue	19,573	12,354
Deferred income taxes	159,071	184,901
Other non-current liabilities	10,381	17,068
Commitments and contingencies (Note 16)		
Series D redeemable convertible preferred stock, \$0.10 par value—Authorized—3,636 shares as of June 30, 2019 and 2018		
Issued and outstanding—none as of June 30, 2019 and 2018	—	—
Stockholders' equity:		
Common stock, \$0.10 par value—Authorized—210,000,000 shares		
Issued—103,642,292 shares at June 30, 2019 and 103,130,300 shares at June 30, 2018		
Outstanding—68,624,566 shares at June 30, 2019 and 71,186,701 shares at June 30, 2018	10,365	10,313
Additional paid-in capital	739,099	715,475
Retained earnings	1,259,984	997,250
Accumulated other comprehensive income	336	1,388
Treasury stock, at cost— 35,017,726 shares of common stock at June 30, 2019 and 31,943,599 shares at June 30, 2018	(1,616,499)	(1,316,499)
Total stockholders' equity	393,285	407,927
Total liabilities and stockholders' equity	<u>\$ 903,065</u>	<u>\$ 852,843</u>

See accompanying notes to these consolidated financial statements.

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

	Common Stock		Additional Paid-in Capital	Retained (Deficit) Earnings	Accumulated Other Comprehensive Income	Treasury Stock		Total Stockholders' (Deficit) Equity
	Number of Shares	\$0.10 Par Value				Number of Shares	Cost	
(Dollars in Thousands, Except Share Data)								
June 30, 2016, As Previously Reported	<u>102,031,960</u>	<u>\$ 10,203</u>	<u>\$ 659,287</u>	<u>\$ (5,676)</u>	<u>\$ 2,651</u>	<u>21,854,010</u>	<u>\$ (741,499)</u>	<u>\$ (75,034)</u>
Cumulative adjustment to retained earnings				529,837				
June 30, 2016, As Adjusted	<u>102,031,960</u>	<u>\$ 10,203</u>	<u>\$ 659,287</u>	<u>\$ 524,161</u>	<u>\$ 2,651</u>	<u>21,854,010</u>	<u>\$ (741,499)</u>	<u>\$ 454,803</u>
Comprehensive income:								
Net income	—	—	—	179,386	—	—	—	179,386
Other comprehensive loss	—	—	—	—	(1,192)	—	—	(1,192)
Issuances of shares of common stock	332,937	34	9,239	—	—	—	—	9,273
Issuance of restricted stock units and net share settlement related to withholding taxes	202,232	20	(5,812)	—	—	—	—	(5,792)
Repurchase of common stock	—	—	—	—	—	7,291,966	(375,000)	(375,000)
Stock-based compensation	—	—	18,800	—	—	—	—	18,800
Excess tax benefits from stock-based compensation	—	—	5,965	—	—	—	—	5,965
June 30, 2017, As Adjusted	<u>102,567,129</u>	<u>\$ 10,257</u>	<u>\$ 687,479</u>	<u>\$ 703,547</u>	<u>\$ 1,459</u>	<u>29,145,976</u>	<u>\$ (1,116,499)</u>	<u>\$ 286,243</u>
Comprehensive income:								
Net income	—	—	—	293,703	—	—	—	293,703
Other comprehensive loss	—	—	—	—	(71)	—	—	(71)
Issuances of shares of common stock	362,515	36	13,395	—	—	—	—	13,431
Issuance of restricted stock units and net share settlement related to withholding taxes	200,656	20	(8,087)	—	—	—	—	(8,067)
Repurchase of common stock	—	—	—	—	—	2,797,623	(200,000)	(200,000)
Stock-based compensation	—	—	22,688	—	—	—	—	22,688
June 30, 2018, As Adjusted	<u>103,130,300</u>	<u>\$ 10,313</u>	<u>\$ 715,475</u>	<u>\$ 997,250</u>	<u>\$ 1,388</u>	<u>31,943,599</u>	<u>\$ (1,316,499)</u>	<u>\$ 407,927</u>
Comprehensive income:								
Net income	—	—	—	262,734	—	—	—	262,734
Other comprehensive loss	—	—	—	—	(1,052)	—	—	(1,052)
Issuances of shares of common stock	266,014	27	10,803	—	—	—	—	10,830
Issuance of restricted stock units and net share settlement related to withholding taxes	245,978	25	(14,752)	—	—	—	—	(14,727)
Repurchase of common stock	—	—	—	—	—	3,074,127	(300,000)	(300,000)
Stock-based compensation	—	—	27,573	—	—	—	—	27,573
June 30, 2019	<u>103,642,292</u>	<u>\$ 10,365</u>	<u>\$ 739,099</u>	<u>\$ 1,259,984</u>	<u>\$ 336</u>	<u>35,017,726</u>	<u>\$ (1,616,499)</u>	<u>\$ 393,285</u>

See accompanying notes to these consolidated financial statements.

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF CASH FLOWS

	Year Ended June 30,		
	2019	2018	2017
		As Adjusted	As Adjusted
		(Dollars in Thousands)	
Cash flows from operating activities:			
Net income	\$ 262,734	\$ 293,703	\$ 179,386
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	8,143	6,544	6,405
Net foreign currency (gains) losses	(1,251)	980	(1,036)
Stock-based compensation	27,573	22,688	18,800
Deferred income taxes	(26,839)	(110,308)	5,273
Provision for bad debts	645	1,418	199
Tax benefits from stock-based compensation	—	—	5,965
Excess tax benefits from stock-based compensation	—	—	(5,965)
Other non-cash operating activities	429	421	602
Changes in assets and liabilities:			
Accounts receivable	(6,626)	846	(8,164)
Contract assets	(59,322)	3,640	(4,327)
Contract costs	(4,482)	(617)	(203)
Prepaid expenses, prepaid income taxes, and other assets	(2,411)	3,821	(2,421)
Accounts payable, accrued expenses, income taxes payable and other liabilities	21,921	1,156	(9,070)
Deferred revenue	17,799	(17,356)	(3,058)
Net cash provided by operating activities	238,313	206,936	182,386
Cash flows from investing activities:			
Purchases of marketable securities	—	—	(683,748)
Maturities of marketable securities	—	—	686,346
Purchase of property, equipment and leasehold improvements	(436)	(331)	(2,720)
Payments for business acquisitions, net of cash	(6,098)	(33,700)	(36,171)
Payments for capitalized computer software costs	(1,131)	(329)	(405)
Net cash used in investing activities	(7,665)	(34,360)	(36,698)
Cash flows from financing activities:			
Proceeds from issuances of shares of common stock	10,864	13,466	9,273
Repurchases of common stock	(299,214)	(205,049)	(371,491)
Payment of tax withholding obligations related to restricted stock	(14,477)	(7,896)	(5,764)
Deferred business acquisition payments	(1,700)	(8,649)	—
Excess tax benefits from stock-based compensation	—	—	5,965
Proceeds from credit agreement	50,000	30,000	—
Payments of credit agreement issuance costs	—	(351)	—
Net cash used in financing activities	(254,527)	(178,479)	(362,017)

Effect of exchange rate changes on cash and cash equivalents	(360)	114	(53)
Decrease in cash and cash equivalents	(24,239)	(5,789)	(216,382)
Cash and cash equivalents, beginning of year	96,165	101,954	318,336
Cash and cash equivalents, end of year	\$ 71,926	\$ 96,165	\$ 101,954
Supplemental disclosure of cash flow information:			
Income tax paid, net	\$ 53,153	\$ 50,557	\$ 65,536
Interest paid	8,121	5,038	3,444
Supplemental disclosure of non-cash investing and financing activities:			
Change in purchases of property, equipment and leasehold improvements included in accounts payable and accrued expenses	104	(61)	(47)
Change in repurchases of common stock included in accounts payable and accrued expenses	786	(5,049)	3,509
See accompanying notes to these consolidated financial statements.			

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(1) Operations

Aspen Technology, Inc., together with its subsidiaries, is a leading global supplier of asset optimization solutions that optimize asset design, operations and maintenance lifecycle in complex, industrial environments. Our aspenONE software and related services have been developed specifically for companies in the process and other capital-intensive industries such as energy, chemicals, engineering and construction, as well as pharmaceuticals, transportation, power, metals and mining, pulp and paper, and consumer packaged goods. Customers use our solutions to improve their competitiveness and profitability by increasing throughput, energy efficiency, and production, reducing unplanned downtime, enhancing capital efficiency, and decreasing working capital requirements over the entire asset lifecycle to support operational excellence. We operate globally in 32 countries as of June 30, 2019.

(2) Significant Accounting Policies**(a) Principles of Consolidation**

The accompanying consolidated financial statements include the accounts of Aspen Technology, Inc. and our wholly owned subsidiaries. All intercompany balances and transactions have been eliminated in consolidation.

Restatement

In connection with the restatement of the fiscal 2019 unaudited quarterly financial statements described in Note 19, "Quarterly Financial Data (Unaudited)," to our Consolidated Financial Statements, we have restated the adjusted June 30, 2018 balance sheet as previously presented in such quarterly financial statements. Refer to Note 19 for further information.

Reclassifications

Certain line items in prior period financial statements have been reclassified to conform to currently reported presentations.

(b) Management Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions. These estimates and assumptions affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenue and expenses during the reporting period. Actual results could differ from those estimates.

(c) Cash and Cash Equivalents

Cash and cash equivalents consist of short-term money market instruments.

(d) Computer Software Development Costs

Certain computer software development costs are capitalized in the accompanying consolidated balance sheets. Capitalization of computer software development costs begins upon establishing technological feasibility defined as meeting specifications determined by the program design. Amortization of capitalized computer software development costs is provided on a product-by-product basis using the greater of (a) the amount computed using the ratio that current gross revenue for a product bears to total of current and anticipated future gross revenue for that product or (b) the straight-line method, beginning upon commercial release of the product, and continuing over the remaining estimated economic life of the product, not to exceed three years.

Total computer software costs capitalized were \$1.1 million, \$0.4 million and \$0.4 million during the years ended June 30, 2019, 2018 and 2017, respectively. Total amortization expense charged to operations was approximately \$0.5 million, \$0.4 million and \$0.5 million for the years ended June 30, 2019, 2018 and 2017, respectively. Computer software development accumulated amortization totaled \$75.1 million and \$74.7 million as of June 30, 2019 and 2018, respectively. Weighted average remaining useful life of computer software development costs was 2.5 years and 1.0 years at June 30, 2019 and 2018, respectively.

At each balance sheet date, we evaluate the unamortized capitalized software costs for potential impairment by comparing the balance to the net realizable value of the products. During the years ending June 30, 2019, 2018 and 2017, our computer

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

software development costs were not considered impaired and as such, we did not recognize impairment losses during the periods then ended.

(e) Foreign Currency Translation

The determination of the functional currency of subsidiaries is based on the subsidiaries' financial and operational environment. Gains and losses from foreign currency translation related to entities whose functional currency is not our reporting currency are credited or charged to accumulated other comprehensive income included in stockholders' equity in the consolidated balance sheets. In all instances, foreign currency transaction and remeasurement gains or losses are credited or charged to the consolidated statements of operations as incurred as a component of other income (expense), net. Net foreign currency transaction and remeasurement gains were \$0.7 million in fiscal 2019, losses were \$(0.8) million in fiscal 2018, and gains were \$0.6 million in fiscal 2017.

(f) Concentration of Credit Risk

Financial instruments that potentially subject us to concentrations of credit risk are principally cash and cash equivalents and accounts receivable. Our cash is held in financial institutions and our cash equivalents are invested in money market mutual funds that we believe to be of high credit quality.

Concentration of credit risk with respect to receivables is limited to certain customers to which we make substantial sales. To reduce risk, we assess the financial strength of our customers. We do not require collateral or other security in support of our receivables. As of June 30, 2019, we had no customer receivable balances that individually represented 10% or more of our net accounts receivable. As of June 30, 2018, we had one customer receivable balance that represented approximately 12% of our total receivables, and was collected subsequent to June 30, 2018.

(g) Computer Software Developed for Internal Use and Long-Lived Assets**Computer Software Developed for Internal Use:**

Computer software developed for internal use is capitalized in accordance with ASC Topic 350-40, *Intangibles Goodwill and Other—Internal Use Software*. We capitalize costs incurred to develop internal-use software during the application development stage after determining software technological requirements and obtaining management approval for funding projects probable of completion.

In fiscal 2019, 2018 and 2017, there were no capitalized direct labor costs associated with our development of software for internal use.

Impairment of Long-Lived Assets:

We evaluate our long-lived assets, which include finite-lived intangible assets, property and leasehold improvements for impairment as events and circumstances indicate that the carrying amount of an asset or a group of assets may not be recoverable. We assess the recoverability of the asset or a group of assets based on the undiscounted future cash flows the asset is expected to generate, and recognize an impairment loss when estimated undiscounted future cash flows expected to result from the use of the asset are less than its carrying value. If an asset or a group of assets are deemed to be impaired, the amount of the impairment loss, if any, represents the excess of the asset's or a group of assets' carrying value compared to their estimated fair values.

(h) Comprehensive Income

Comprehensive income is defined as the change in equity of a business enterprise during a period from transactions and other events and circumstances from non-owner sources. Comprehensive income and its components for fiscal 2019, 2018 and 2017 are disclosed in the accompanying consolidated statements of comprehensive income.

As of June 30, 2019 and 2018, accumulated other comprehensive income is comprised of foreign translation adjustments of \$0.3 million and \$1.4 million, respectively.

(i) Accounting for Stock-Based Compensation

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Stock-based compensation cost is measured at the grant date based on the fair value of the award and is recognized as expense over the vesting period.

(j) Income Taxes

Deferred income taxes are recognized based on temporary differences between the financial statement and tax bases of assets and liabilities. Deferred tax assets and liabilities are measured using the statutory tax rates and laws expected to apply to taxable income in the years in which the temporary differences are expected to reverse. Valuation allowances are provided against net deferred tax assets if, based upon the available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income and the timing of the temporary differences becoming deductible. Management considers, among other available information, scheduled reversals of deferred tax liabilities, projected future taxable income, limitations of availability of net operating loss carryforwards, and other matters in making this assessment.

We do not provide deferred taxes on unremitted earnings of foreign subsidiaries since we intend to indefinitely reinvest either currently or sometime in the foreseeable future. Unrecognized provisions for taxes on undistributed earnings of foreign subsidiaries, which are considered indefinitely reinvested, are not material to our consolidated financial position or results of operations. We are continuously subject to examination by the IRS, as well as various state and foreign jurisdictions. The IRS and other taxing authorities may challenge certain deductions and credits reported by us on our income tax returns. In accordance with provisions of ASC Topic 740, *Income Taxes* (ASC 740), an entity should recognize a tax benefit when it is more-likely-than-not, based on the technical merits, that the position would be sustained upon examination by a taxing authority. The amount to be recognized, if the more-likely-than-not threshold was passed, should be measured as the largest amount of tax benefit that is greater than 50 percent likely of being realized upon ultimate settlement with a taxing authority that has full knowledge of all relevant information. Furthermore, any change in the recognition, de-recognition or measurement of a tax position should be recorded in the period in which the change occurs. We account for interest and penalties related to uncertain tax positions as part of the provision for income taxes.

(k) Loss Contingencies

We accrue estimated liabilities for loss contingencies arising from claims, assessments, litigation and other sources when it is probable that a liability has been incurred and the amount of the claim assessment or damages can be reasonably estimated. We believe that we have sufficient accruals to cover any obligations resulting from claims, assessments or litigation that have met these criteria.

(l) Advertising Costs

Advertising costs are expensed as incurred and are classified as sales and marketing expenses. We incurred advertising expenses of \$4.4 million, \$3.2 million and \$3.2 million during fiscal 2019, 2018 and 2017, respectively.

(m) Research and Development Expense

We charge research and development expenditures to expense as the costs are incurred. Research and development expenses consist primarily of personnel expenses related to the creation of new products, enhancements and engineering changes to existing products and costs of acquired technology prior to establishing technological feasibility.

During fiscal 2017, we acquired certain technologies for \$2.3 million. At the time we acquired the technology, the project to develop a commercially available product did not meet the definition of having reached technological feasibility and as such, the entire cost of the acquired technology was expensed as research and development expense.

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(n) New Accounting Pronouncements Adopted in Fiscal 2019

In May 2014, the FASB issued Topic 606, which supersedes the revenue recognition requirements in *Revenue Recognition (Topic 605)*, and requires entities to recognize revenue when they transfer promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. Under the new guidance, an entity is required to evaluate revenue recognition through a five-step process. In applying the principles of Topic 606, more judgment and estimates are required within the revenue recognition process than were required under previous U.S. GAAP, including identifying performance obligations in the contract, estimating the amount of variable consideration to include in the transaction price, and allocating the transaction price to each separate performance obligation.

We adopted Topic 606 effective July 1, 2018 using the full retrospective method, which required us to adjust the prior periods presented. The adoption of Topic 606 impacted the timing of the license portion of the revenue recognized from our term contracts. Under the new standard, for arrangements that include term-based software licenses bundled with maintenance and support, we are now required to recognize as revenue a portion of the arrangement fee upon delivery of the software license. We recognize as revenue a portion of the arrangement fee related to maintenance and support, professional services, and training over time as the services are provided. Additionally, under the new standard, we capitalize certain direct and incremental commission costs to obtain a contract and amortize such costs over the expected period of benefit, rather than expensing them as incurred in the period that the commissions are earned. See Note 3, "Revenue from Contracts with Customers," to our Consolidated Financial Statements for more information on our accounting policies as a result of the adoption of Topic 606.

In January 2017, the FASB issued ASU No. 2017-01, *Business Combinations (Topic 805) - Clarifying the Definition of a Business*. The amendment changes the definition of a business to assist entities in evaluating when a set of transferred assets and activities constitutes a business. We adopted ASU No. 2017-01 effective July 1, 2018. The adoption of ASU No. 2017-01 did not have a material effect on our consolidated financial statements or related disclosures.

In March 2018, the FASB issued ASU No. 2018-05, *Income Taxes (Topic 740) - Amendments to SEC Paragraphs Pursuant to SEC Staff Accounting Bulletin No. 118*. The amendment provides guidance on accounting for the impact of the Tax Cuts and Jobs Act (the "Tax Act") and allows entities to complete the accounting under ASC 740 within a one-year measurement period from the Tax Act enactment date. This standard is effective upon issuance. The Tax Act has several significant changes that impact all taxpayers, including a transition tax, which is a one-time tax charge on accumulated, undistributed foreign earnings. The calculation of accumulated foreign earnings requires an analysis of each foreign entity's financial results going back to 1986. We have concluded that we will not be subject to the transition tax associated with our accumulated, undistributed foreign earnings.

In August 2018, the FASB issued ASU 2018-15, *Intangibles - Goodwill and Other - Internal-Use Software (Subtopic 350-40) - Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement that is a Service Contract*. The amendment aligns the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software (and hosting arrangements that include an internal use software license). The accounting for the service element of a hosting arrangement that is a service contract is not affected by the amendment. The ASU is effective for annual periods, including interim periods within those annual periods, beginning after December 15, 2019. We adopted ASU No. 2018-15 effective October 1, 2018. During fiscal 2019, \$0.8 million of implementation costs were capitalized, and \$0.1 million expensed, as a result of the adoption of ASU No. 2018-15.

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(o) Recently Issued Accounting Pronouncements

In February 2016, the FASB issued ASU No. 2016-02, *Leases (Topic 842)*. Under the amendment, lessees will be required to recognize virtually all of their leases on the balance sheet, by recording a right-of-use asset and lease liability. The ASU is effective for annual periods, including interim periods within those annual periods, beginning after December 15, 2018. Early adoption is permitted. We will adopt Topic 842 using the modified retrospective method effective July 1, 2019. We will elect the available practical expedients permitted under the transition guidance within the new standard, and will implement internal controls to enable the preparation of financial information upon adoption. The most significant impact will be the recognition of right-of use (ROU) assets and lease liabilities for operating leases, while our accounting for capital leases will remain substantially unchanged. Based upon the work performed to date, we expect the adoption of Topic 842 will result in the recognition of a right-of-use asset, and a corresponding lease liability, of approximately \$32.0 million to \$36.0 million on the consolidated balance sheets. The difference between the assets and liabilities will be attributable to the reclassification of certain existing lease-related assets and liabilities. Where applicable, a corresponding deferred tax asset and liability will be recorded related to the right-of-use asset and lease liability. Topic 842 is not expected to materially impact the consolidated statements of operations or consolidated statements of cash flows.

(3) Revenue from Contracts with Customers

In accordance with Topic 606, we account for a customer contract when both parties have approved the contract and are committed to perform their respective obligations, each party's rights can be identified, payment terms can be identified, the contract has commercial substance, and it is probable that we will collect substantially all of the consideration to which we are entitled. Revenue is recognized when, or as, performance obligations are satisfied by transferring control of a promised product or service to a customer.

Nature of Products and Services

We generate revenue from the following sources: (1) License revenue; (2) Maintenance revenue; and (3) Services and other revenue. We sell our software products to end users primarily under fixed-term licenses. We license our software products primarily through a subscription offering which we refer to as our aspenONE licensing model, which includes software maintenance and support, known as our Premier Plus SMS offering, for the entire term. Our aspenONE products are organized into three suites: 1) engineering; 2) manufacturing and supply chain; and 3) asset performance management. The aspenONE licensing model provides customers with access to all of the products within the aspenONE suite(s) they license. We refer to these arrangements as token arrangements. Tokens are fixed units of measure. The amount of software usage is limited by the number of tokens purchased by the customer.

We also license our software through point product term arrangements, which include our Premier Plus SMS offering for the entire term.

We determine revenue recognition through the following steps:

- Identification of the contract, or contracts, with a customer;
- Identification of the performance obligations in the contract;
- Determination of the transaction price;
- Allocation of the transaction price to the performance obligations in the contract; and
- Recognition of revenue when, or as, we satisfy a performance obligation.

Term-based Arrangements: Term-based arrangements consist of on-premise term licenses as well as maintenance.

License

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS**

License revenue consists primarily of product and related revenue from our aspenONE licensing model and point product arrangements.

When a customer elects to license our products under our aspenONE licensing model, the customer receives, for the term of the arrangement, the right to all software products in the licensed aspenONE software suite. When a customer elects to license point products, the customer receives, for the term of the arrangement, the right to license specified products in the licensed aspenONE software suite. Revenue from initial product licenses is recognized upfront upon delivery.

Maintenance

When a customer elects to license our products under our aspenONE licensing model, our Premier Plus SMS offering is included for the entire term of the arrangement and the customer receives, for the term of the arrangement, the right to any updates that may be introduced into the licensed aspenONE software suite. When a customer elects to license point products, our Premier Plus SMS offering is included for the entire term of the arrangement and the customer receives, for the term of the arrangement, the right to any updates that may be introduced related to the specified products licensed. Maintenance represents a stand-ready obligation and, due to our obligation to provide unspecified future software updates on a when-and-if available basis as well as telephone support services, we are required to recognize revenue ratably over the term of the arrangement.

Services and Other Revenue***Professional Services Revenue***

Professional services are provided to customers on a time-and-materials ("T&M") or fixed-price basis. The obligation to provide professional services is generally satisfied over time, with the customer simultaneously receiving and consuming the benefits as we satisfy our performance obligation. For professional services, revenue is recognized by measuring progress toward the completion of our obligations. We recognize professional services fees for our T&M contracts based upon hours worked and contractually agreed-upon hourly rates. Revenue from fixed-price engagements is recognized using the proportional performance method based on the ratio of costs incurred to the total estimated project costs. The use of the proportional performance method is dependent upon our ability to reliably estimate the costs to complete a project. We use historical experience as a basis for future estimates to complete current projects. Additionally, we believe that costs are the best available measure of performance. Out-of-pocket expenses which are reimbursed by customers are recorded as revenue.

Training Revenue

We provide training services to our customers, including on-site, Internet-based, public and customized training. The obligation to provide training services is generally satisfied over time, with the customer simultaneously receiving and consuming the benefits as we satisfy our performance obligation. Revenue is recognized in the period in which the services are performed.

Contracts with Multiple Performance Obligations

Our contracts generally contain more than one of the products and services listed above, each of which is separately accounted for as a distinct performance obligation.

Allocation of consideration: We allocate total contract consideration to each distinct performance obligation in an arrangement on a relative standalone selling price basis. The standalone selling price reflects the price we would charge for a specific product or service if it was sold separately in similar circumstances and to similar customers.

If the arrangement contains professional services and other products or services, we allocate to the professional service obligation a portion of the total contract consideration based on the standalone selling price of professional services that is observed from consistently priced standalone sales.

The standalone selling price for term licenses, which are always sold with maintenance, is the price for the combined license and maintenance bundle. The amount assigned to the license and maintenance bundle is separated into license and maintenance amounts using the respective standalone selling prices represented by the value relationship between the software license and maintenance.

When two or more contracts are entered into at or near the same time with the same customer, we evaluate the facts and circumstances associated with the negotiation of those contracts. Where the contracts are negotiated as a package, we will

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS**

account for them as a single arrangement and allocate the consideration for the combined contracts among the performance obligations accordingly.

Standalone selling price: When available, we use directly observable transactions to determine the standalone selling prices for performance obligations. Generally, directly observable data is not available for term licenses and maintenance. When term licenses are sold together with maintenance in a bundled arrangement, we estimate a standalone selling price for these distinct performance obligations using relevant information, including our overall pricing objectives and strategies and historical pricing data, and taking into consideration market conditions and other factors.

Other policies and judgments

Payment terms and conditions vary by contract type, although terms generally include a requirement of payment annually over the term of the license arrangement. Therefore, we generally receive payment from a customer after the performance obligation related to the license has been satisfied, and therefore, our contracts generally contain a significant financing component. The significant financing component is calculated utilizing an interest rate that derives the net present value of the performance obligations delivered on an upfront basis based on the allocation of consideration. We have instituted a customer portfolio approach in assigning interest rates. The rates are determined at contract inception and are based on the credit characteristics of the customers within each portfolio.

Contract modifications

We sometimes enter into agreements to modify previously executed contracts, which constitute contract modifications. We assess each of these contract modifications to determine (i) if the additional products and services are distinct from the products and services in the original arrangement; and (ii) if the amount of consideration expected for the added products and services reflects the stand-alone selling price of those products and services, as adjusted for contract-specific circumstances. A contract modification meeting both criteria is accounted for as a separate contract. A contract modification not meeting both criteria is considered a change to the original contract and is accounted for on either (i) a prospective basis as a termination of the existing contract and the creation of a new contract; or (ii) a cumulative catch-up basis. Generally, our contract modifications meet both criteria and are accounted for as a separate contract, as adjusted for contract-specific circumstances.

Disaggregation of Revenue

We disaggregate our revenue by region, type of performance obligation, timing of revenue recognition, and segment as follows:

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

	Year Ended June 30,		
	2019	2018	2017
	As Adjusted		As Adjusted
(Dollars in Thousands)			
Revenue by region:			
United States	\$ 219,967	\$ 207,266	\$ 158,761
Europe	155,543	126,862	166,133
Other (1)	222,835	184,731	169,533
	<u>\$ 598,345</u>	<u>\$ 518,859</u>	<u>\$ 494,427</u>
Revenue by type of performance obligation:			
License	\$ 404,122	\$ 326,549	\$ 307,259
Maintenance	165,436	161,065	157,012
Services and other	28,787	31,245	30,156
	<u>\$ 598,345</u>	<u>\$ 518,859</u>	<u>\$ 494,427</u>
Revenue by segment:			
Subscription and software	\$ 569,558	\$ 487,614	\$ 464,271
Services and other	28,787	31,245	30,156
	<u>\$ 598,345</u>	<u>\$ 518,859</u>	<u>\$ 494,427</u>

(1) Other consists primarily of Asia Pacific, Canada, Latin America and the Middle East.

Contract Balances

The difference in the opening and closing balances of our contract assets and deferred revenue primarily results from the timing difference between our performance and the customer's payment. We fulfill our obligations under a contract with a customer by transferring products and services in exchange for consideration from the customer. We recognize a contract asset when we transfer products or services to a customer and the right to consideration is conditional on something other than the passage of time. Accounts receivable are recorded when the customer has been billed or the right to consideration is unconditional. We recognize deferred revenue when we have received consideration or an amount of consideration is due from the customer and we have a future obligation to transfer products or services.

Our contract assets and deferred revenue were as follows as of June 30, 2019 and 2018:

	June 30, 2019	June 30, 2018
	As Restated	
(Dollars in Thousands)		
Contract assets	\$ 619,703	\$ 557,377
Deferred revenue	(44,891)	(27,504)
	<u>\$ 574,812</u>	<u>\$ 529,873</u>

Contract assets and deferred revenue are presented net at the contract level for each reporting period.

The change in deferred revenue during fiscal 2019 was primarily due to an increase in new billings in advance of revenue recognition, partially offset by \$14.0 million of revenue recognized that was included in deferred revenue at June 30, 2018.

Contract Costs

We pay commissions for new product sales as well as for renewals of existing contracts. Commissions paid to obtain renewal contracts are not commensurate with the commissions paid for new product sales and therefore, a portion of the commissions paid for new contracts relate to future renewals.

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES

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We account for new product sales commissions using a portfolio approach and allocate the cost of commissions in proportion to the allocation of transaction price of license and maintenance performance obligations, including assumed renewals. Commissions allocated to the license and license renewal components are expensed at the time the license revenue is recognized. Commissions allocated to maintenance are capitalized and amortized on a straight-line basis over a period of four years to eight years for new contracts, reflecting our estimate of the expected period that we will benefit from those commissions.

Amortization of capitalized contract costs is included in sales and marketing expenses in our Consolidated Statement of Operations.

Transaction Price Allocated to Remaining Performance Obligations

The following table includes the aggregate amount of the transaction price allocated as of June 30, 2019 to the performance obligations that are unsatisfied (or partially unsatisfied) at the end of the reporting period:

	Year Ended June 30,					
	2020	2021	2022	2023	2024	Thereafter
	(Dollars in Thousands)					
License	\$ 47,869	\$ 31,944	\$ 9,820	\$ 3,575	\$ 1,559	\$ 721
Maintenance	193,348	144,734	101,127	64,286	37,613	14,847
Services and other	43,679	646	594	345	74	16

Impact to Prior Period Information

The following table presents the effect of the adoption of Topic 606 on select consolidated statements of operations line items for fiscal 2018 and 2017:

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	Year Ended June 30, 2018		
	As Previously Reported	Adjustments	As Adjusted
	(Dollars in Thousands, Except per Share Data)		
Consolidated Statements of Operations:			
License revenue	\$ —	\$ 326,549	\$ 326,549
Maintenance revenue	—	161,065	161,065
Subscription and software revenue	471,041	(471,041)	—
Services and other revenue	28,473	2,772	31,245
Total revenue	499,514	19,345	518,859
Gross profit	448,870	19,345	468,215
Selling and marketing expense	101,077	(1,340)	99,737
General and administrative expense	56,076	11,105	67,181
Total operating expenses	239,229	9,765	248,994
Income from operations	209,641	9,580	219,221
Interest income	231	24,723	24,954
Provision for (benefit from) income taxes	54,655	(110,712)	(56,057)
Net income	\$ 148,688	\$ 145,015	\$ 293,703
Net income per common share:			
Basic	\$ 2.06		\$ 4.07
Diluted	\$ 2.04		\$ 4.03
Weighted average shares outstanding:			
Basic	72,140		72,140
Diluted	72,956		72,956

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	Year Ended June 30, 2017		
	As Previously Reported	Adjustments	As Adjusted
	(Dollars in Thousands, Except per Share Data)		
Consolidated Statements of Operations:			
License revenue	\$ —	\$ 307,259	\$ 307,259
Maintenance revenue	—	157,012	157,012
Subscription and software revenue	453,512	(453,512)	—
Services and other revenue	29,430	726	30,156
Total revenue	482,942	11,485	494,427
Gross profit	435,476	11,485	446,961
Selling and marketing expense	92,633	(656)	91,977
General and administrative expense	51,297	7,438	58,735
Total operating expenses	223,460	6,782	230,242
Income from operations	212,016	4,703	216,719
Interest income	808	22,134	22,942
Provision for income taxes	48,150	9,647	57,797
Net income	\$ 162,196	\$ 17,190	\$ 179,386
Net income per common share:			
Basic	\$ 2.12		\$ 2.35
Diluted	\$ 2.11		\$ 2.33
Weighted average shares outstanding:			
Basic	76,491		76,491
Diluted	76,978		76,978

The following table presents the effect of the adoption of Topic 606 on select consolidated balance sheet line items as of June 30, 2018:

	June 30, 2018		
	As Previously Reported	Adjustments	As Restated
	(Dollars in Thousands)		
Consolidated Balance Sheets:			
ASSETS			
Current contract assets	\$ —	\$ 237,537	\$ 237,537
Contract costs	—	20,500	20,500
Accounts receivable, net	21,910	19,900	41,810
Non-current contract assets	—	319,840	319,840
Non-current deferred tax assets	11,090	(9,858)	1,232
Total assets	264,924	587,919	852,843
LIABILITIES AND STOCKHOLDERS' EQUITY			
Current deferred revenue	286,845	(271,695)	15,150
Non-current deferred revenue	28,259	(15,905)	12,354
Deferred income taxes	—	184,901	184,901
Other non-current liabilities	18,492	(1,424)	17,068
Retained earnings	305,208	692,042	997,250
Total liabilities and stockholders' equity	\$ 264,924	\$ 587,919	\$ 852,843

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES
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The adoption of Topic 606 had no impact on our total cash flows or net cash provided by operating activities. The impacts of adoption resulted in offsetting shifts in cash flows throughout the components of net income and various changes in working capital balances. The following table presents the effect of the adoption of Topic 606 on select consolidated statement of cash flows line items for fiscal 2018 and 2017:

	Year Ended June 30, 2018		
	As Previously Reported	Adjustments	As Adjusted
	<i>(Dollars in Thousands)</i>		
Consolidated Statements of Cash Flows:			
Cash flows from operating activities:			
Net income	\$ 148,688	\$ 145,015	\$ 293,703
Adjustments to reconcile net income to net cash provided by operating activities:			
Deferred income taxes	3,193	(113,501)	(110,308)
Changes in assets and liabilities:			
Contract assets	—	3,640	3,640
Contract costs	—	(617)	(617)
Accounts receivable	4,327	(3,481)	846
Deferred revenue	13,700	(31,056)	(17,356)
Net cash provided by operating activities	\$ 206,936	\$ —	\$ 206,936

	Year Ended June 30, 2017		
	As Previously Reported	Adjustments	As Adjusted
	<i>(Dollars in Thousands)</i>		
Consolidated Statements of Cash Flows:			
Cash flows from operating activities:			
Net income	\$ 162,196	\$ 17,190	\$ 179,386
Adjustments to reconcile net income to net cash provided by operating activities:			
Deferred income taxes	(4,286)	9,559	5,273
Changes in assets and liabilities:			
Contract assets	—	(4,327)	(4,327)
Contract costs	—	(203)	(203)
Accounts receivable	(7,480)	(684)	(8,164)
Deferred revenue	18,477	(21,535)	(3,058)
Net cash provided by operating activities	\$ 182,386	\$ —	\$ 182,386

As referenced in Item 9A, "Controls and Procedures," the previously issued unaudited consolidated financial statements in our quarterly reports on Form 10-Q for the quarters ended September 30, 2018, December 31, 2018 and March 31, 2019 have been restated in this Form 10-K. See Note 19, "Quarterly Financial Data (Unaudited)," to our Consolidated Financial Statements for the restated financial statements.

(4) Fair Value

We determine fair value by utilizing a fair value hierarchy that ranks the quality and reliability of the information used in its determination. Fair values determined using "Level 1 inputs" utilize unadjusted quoted prices in active markets for identical assets or liabilities that we have the ability to access. Fair values determined using "Level 2 inputs" utilize data points that are observable, such as quoted prices, interest rates and yield curves for similar assets and liabilities.

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES

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Cash equivalents of \$1.0 million and \$5.0 million as of June 30, 2019 and June 30, 2018, respectively, were reported at fair value utilizing quoted market prices in identical markets, or “Level 1 inputs.” Our cash equivalents consist of short-term money market instruments.

Financial instruments not measured or recorded at fair value in the accompanying unaudited consolidated financial statements consist of accounts receivable, accounts payable and accrued liabilities. The estimated fair value of these financial instruments approximates their carrying value. The estimated fair value of the borrowings under the Credit Agreement (described below in Note 11, Credit Agreement) approximates its carrying value due to the floating interest rate.

(5) Accounts Receivable

Our accounts receivable, net of the related allowance for doubtful accounts, were as follows as of June 30, 2019 and 2018:

	June 30, 2019	June 30, 2018
	As Restated	
	(Dollars in Thousands)	
Accounts receivable, gross	\$ 51,133	\$ 44,513
Allowance for doubtful accounts	(3,349)	(2,703)
Accounts receivable, net	<u>\$ 47,784</u>	<u>\$ 41,810</u>

As of June 30, 2019, we had no customer receivable balances that individually represented 10% or more of our net accounts receivable. As of June 30, 2018, we had one customer receivable balance that represented approximately 12% of our total receivables, and was collected subsequent to June 30, 2018.

(6) Property and Equipment

Property, equipment and leasehold improvements in the accompanying consolidated balance sheets consist of the following:

	Year Ended June 30,	
	2019	2018
	(Dollars in Thousands)	
Property, equipment and leasehold improvements, at cost:		
Computer equipment	\$ 6,642	\$ 8,344
Purchased software	22,793	24,225
Furniture & fixtures	6,794	6,850
Leasehold improvements	12,232	12,023
Property, equipment and leasehold improvements, at cost	<u>48,461</u>	<u>51,442</u>
Accumulated depreciation	(41,227)	(41,636)
Property, equipment and leasehold improvements, net	<u>\$ 7,234</u>	<u>\$ 9,806</u>

Property and equipment are stated at cost. We record depreciation using the straight-line method over their estimated useful lives, as follows:

<u>Asset Classification</u>	<u>Estimated Useful Life</u>
Computer equipment	3 years
Purchased software	3 - 5 years
Furniture and fixtures	3 - 10 years
Leasehold improvements	Life of lease or asset, whichever is shorter

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During fiscal 2019 and 2018, we wrote off fully depreciated property, equipment and leasehold improvements that were no longer in use with gross book values of \$3.5 million and less than \$0.1 million, respectively.

Depreciation expense was \$3.1 million, \$3.9 million and \$5.0 million for fiscal 2019, 2018 and 2017, respectively.

We account for asset retirement obligations in accordance with ASC Topic 410, *Asset Retirement and Environmental Obligations*. Our asset retirement obligations relate to leasehold improvements for leased properties. The balance of our asset retirement obligations was \$0.9 million as of June 30, 2019 and 2018, respectively.

(7) Acquisitions

Apex Optimisation

On February 5, 2018, we completed the acquisition of all the outstanding shares of Apex Optimisation and affiliates (“Apex”), a provider of software which aligns Advanced Process Control with Planning and Scheduling to unify production optimization, for a total cash consideration of \$23.0 million. The purchase price consisted of \$18.4 million of cash paid at closing and an additional \$4.6 million to be held back until February 2020 as security for certain representations, warranties, and obligations of the sellers. The holdback is recorded in accrued expenses and other current liabilities in our consolidated balance sheet.

An allocation of the purchase price is as follows:

	Amount
	(Dollars in Thousands)
Tangible assets acquired, net	\$ 360
Identifiable intangible assets:	
Technology-related	4,500
Customer relationships	3,800
Goodwill	15,959
Deferred tax liabilities	(1,619)
Total assets acquired, net	\$ 23,000

We used the relief from royalty and income approaches to derive the fair value of the technology-related and customer relationship intangible assets, respectively. The weighted-average discount rate (or rate of return) used to determine the value of the Apex intangible assets was 28% and the effective tax rate used was 21%. The technology-related and customer relationship intangible assets will each be amortized on a straight-line basis over their estimated useful lives of seven years.

The goodwill, which is not deductible for tax purposes, reflects the value of the assembled workforce and the company-specific synergies we expect to realize by selling Apex products and services to our existing customers. The results of operations of Apex have been included prospectively in our results of operations since the date of acquisition.

Sabisu Ltd.

On June 12, 2019, we completed the acquisition of all the outstanding shares of Argent & Waugh Limited and Sabisu Ltd. (“Sabisu”), a provider of a flexible enterprise visualization and workflow solution to deliver real-time decision support, for a total cash consideration of \$7.6 million. The purchase price consisted of \$6.1 million of cash paid at closing and an additional \$1.5 million to be held back until June 2021 as security for certain representations, warranties, and obligations of the sellers. The holdback is recorded in other non-current liabilities in our consolidated balance sheet.

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES
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A preliminary allocation of the initial purchase price is as follows:

	<u>Amount</u>
	<u>(Dollars in Thousands)</u>
Tangible assets acquired, net	\$ 355
Identifiable intangible assets:	
Technology-related	1,525
Customer relationships	1,525
Goodwill	4,783
Deferred tax liabilities	(564)
Total assets acquired, net	<u>\$ 7,624</u>

Mnubo, Inc.

On July 12, 2019, we completed the acquisition of all the outstanding shares of Mnubo Inc. (“Mnubo”), a provider of purpose-built artificial intelligence and analytics infrastructure for the internet of things, for a total cash consideration of \$78.0 million. We intend to account for the Mnubo acquisition as a business combination. The allocation of the purchase price is subject to the valuation of the net assets acquired.

(8) Intangible Assets

We include in our amortizable intangible assets those intangible assets acquired in our business and asset acquisitions. We amortize acquired intangible assets with finite lives over their estimated economic lives, generally using the straight-line method. Each period, we evaluate the estimated remaining useful lives of acquired intangible assets to determine whether events or changes in circumstances warrant a revision to the remaining period of amortization. Acquired intangibles are removed from the accounts when fully amortized and no longer in use.

Intangible assets consist of the following as of June 30, 2019 and 2018:

	<u>Gross Carrying Amount</u>	<u>Accumulated Amortization</u>	<u>Effect of Currency Translation</u>	<u>Net Carrying Amount</u>
	<u>(Dollars in Thousands)</u>			
June 30, 2019:				
Technology and patents	\$ 37,168	\$ (8,868)	\$ (118)	\$ 28,182
Customer relationships	6,503	(1,039)	(100)	5,364
Non-compete agreements	553	(492)	—	61
Total	<u>\$ 44,224</u>	<u>\$ (10,399)</u>	<u>\$ (218)</u>	<u>\$ 33,607</u>
June 30, 2018:				
Technology and patents	\$ 35,898	\$ (5,182)	\$ (254)	\$ 30,462
Customer relationships	5,181	(377)	(202)	4,602
Non-compete agreements	553	(307)	—	246
Total	<u>\$ 41,632</u>	<u>\$ (5,866)</u>	<u>\$ (456)</u>	<u>\$ 35,310</u>

Total amortization expense related to intangible assets amounted to \$4.5 million, \$2.2 million and \$1.0 million in fiscal 2019, 2018 and 2017, respectively.

Future amortization expense as of June 30, 2019 is expected to be as follows:

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Year Ended June 30,	Amortization Expense (Dollars in Thousands)
2020	\$ 5,120
2021	5,165
2022	5,104
2023	5,019
2024	4,326
Thereafter	8,873
Total	\$ 33,607

(9) Goodwill

The changes in the carrying amount of goodwill for our subscription and software reporting unit during fiscal years ending June 30, 2019 and 2018 were as follows:

	Gross Carrying Amount	Accumulated Impairment Losses	Effect of Currency Translation	Net Carrying Amount
June 30, 2018:	\$ 142,316	\$ (65,569)	\$ (1,157)	\$ 75,590
Goodwill from acquisitions, net of adjustments	3,256	—	—	3,256
Foreign currency translation	—	—	(463)	(463)
June 30, 2019:	\$ 145,572	\$ (65,569)	\$ (1,620)	\$ 78,383
	Gross Carrying Amount	Accumulated Impairment Losses	Effect of Currency Translation	Net Carrying Amount
June 30, 2017:	\$ 116,833	\$ (65,569)	\$ (16)	\$ 51,248
Goodwill from acquisitions, net of adjustments	25,483	—	—	25,483
Foreign currency translation	—	—	(1,141)	(1,141)
June 30, 2018:	\$ 142,316	\$ (65,569)	\$ (1,157)	\$ 75,590

We test goodwill for impairment annually (or more often if impairment indicators arise), at the reporting unit level. We first assess qualitative factors to determine whether the existence of events or circumstances indicates that it is more likely than not that the fair value of a reporting unit is less than its carrying amount. If we determine based on this assessment that it is more likely than not that the fair value of a reporting unit is less than its carrying amount, we perform the goodwill impairment test. The first step requires us to determine the fair value of the reporting unit and compare it to the carrying amount, including goodwill, of such reporting unit. If the fair value exceeds the carrying amount, no impairment loss is recognized. However, if the carrying amount of the reporting unit exceeds its fair value, the goodwill of the unit is impaired.

Fair value of a reporting unit is determined using a combined weighted average of a market-based approach (utilizing fair value multiples of comparable publicly traded companies) and an income-based approach (utilizing discounted projected cash flows). In applying the income-based approach, we would be required to make assumptions about the amount and timing of future expected cash flows, growth rates and appropriate discount rates. The amount and timing of future cash flows would be based on our most recent long-term financial projections. The discount rate we would utilize would be determined using estimates of market participant risk-adjusted weighted-average costs of capital and reflect the risks associated with achieving future cash flows.

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We have elected December 31st as the annual impairment assessment date and perform additional impairment tests if triggering events occur. We performed our annual impairment test for the subscription and software reporting unit as of December 31, 2018 and, based upon the results of our qualitative assessment, determined that it was not likely that its fair value was less than its carrying amount. As such, we did not recognize impairment losses as a result of our analysis. If an event occurs or circumstances change that would more likely than not reduce the fair value of a reporting unit below its carrying value, goodwill will be evaluated for impairment between annual tests. No triggering events indicating goodwill impairment occurred during fiscal 2019, 2018 and 2017.

(10) Accrued Expenses and Other Liabilities

Accrued expenses and other current liabilities in the accompanying consolidated balance sheets consist of the following:

	June 30, 2019	June 30, 2018
(Dollars in Thousands)		
Compensation-related	\$ 27,147	\$ 21,796
Deferred acquisition payments	4,600	1,700
Uncertain tax positions	3,751	—
Royalties and outside commissions	3,665	3,333
Share repurchases	2,432	1,646
Professional fees	3,053	1,695
Deferred rent	1,331	1,188
Other	8,615	8,157
Total accrued expenses and other current liabilities	<u>\$ 54,594</u>	<u>\$ 39,515</u>

Other non-current liabilities in the accompanying consolidated balance sheets consist of the following:

	June 30, 2019	June 30, 2018
As Adjusted (Dollars in Thousands)		
Deferred rent	\$ 5,187	\$ 6,442
Uncertain tax positions	2,274	4,510
Deferred acquisition payments	1,524	4,294
Asset retirement obligations	914	916
Other	482	906
Total other non-current liabilities	<u>\$ 10,381</u>	<u>\$ 17,068</u>

(11) Credit Agreement

On February 26, 2016, we entered into a \$250.0 million Credit Agreement (the "Credit Agreement") with JPMorgan Chase Bank, N.A., as administrative agent, Silicon Valley Bank, as syndication agent, and the lenders and other parties named therein (the "Lenders"). On August 9, 2017, we entered into an Amendment to increase the Credit Agreement to \$350.0 million. The indebtedness evidenced by the Credit Agreement matures on February 26, 2021. Prior to the maturity of the Credit Agreement, any amounts borrowed may be repaid and, subject to the terms and conditions of the Credit Agreement, borrowed again in whole or in part without penalty. We had \$220.0 million and \$170.0 million in outstanding borrowings under the Credit Agreement as of June 30, 2019 and 2018, respectively.

Borrowings under the Credit Agreement bear interest at a rate equal to either, at our option, the sum of (a) the highest of (1) the rate of interest publicly announced by JPMorgan Chase Bank, N.A. as its prime rate in effect, (2) the Federal Funds

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES

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Effective Rate plus 0.5%, and (3) the one-month Adjusted LIBO Rate plus 1.0%, plus (b) a margin initially of 0.5% for the first full fiscal quarter ending after the date of the Credit Agreement and thereafter based on our Leverage Ratio; or the Adjusted LIBO Rate plus a margin initially of 1.5% for the first full fiscal quarter ending after the date of the Credit Agreement and thereafter based on our Leverage Ratio. We must also pay, on a quarterly basis, an unused commitment fee at a rate of between 0.2% and 0.3% per annum, based on our Leverage Ratio. The interest rates as of June 30, 2019 were 3.91% on \$159.0 million of our outstanding borrowings and 3.94% on the remaining \$61.0 million of our outstanding borrowings.

All borrowings under the Credit Agreement are secured by liens on substantially all of our assets. The Credit Agreement contains affirmative and negative covenants customary for facilities of this type, including restrictions on: incurrence of additional debt; liens; fundamental changes; asset sales; restricted payments; and transactions with affiliates. The Credit Agreement contains financial covenants regarding maintenance as of the end of each fiscal quarter, commencing with the quarter ending June 30, 2016, of a maximum Leverage Ratio of 3.0 to 1.0 and a minimum Interest Coverage Ratio of 3.0 to 1.0. We were in compliance with all covenants as of June 30, 2019.

(12) Stock-Based Compensation*Stock Compensation Plans*

In December 2016, the shareholders approved the establishment of the 2016 Omnibus Incentive Plan (the 2016 Plan), which provides for the issuance of a maximum of 6,000,000 shares of common stock. The 2016 Plan provides for the grant of incentive and nonqualified stock options, stock appreciation rights, restricted stock, restricted stock units, other stock-related awards, and performance awards that may be settled in cash, stock, or other property. As of June 30, 2019, there were 5,617,627 shares of common stock available for issuance subject to awards under the 2016 Plan.

In April 2010, the shareholders approved the establishment of the 2010 Equity Incentive Plan (the 2010 Plan), which provides for the issuance of a maximum of 7,000,000 shares of common stock. The 2010 Plan provides for the grant of incentive and nonqualified stock options, stock appreciation rights, restricted stock, restricted stock units, other stock-related awards, and performance awards that may be settled in cash, stock, or other property. As of June 30, 2019, there were 1,945,234 shares of common stock available for issuance subject to awards under the 2010 Plan.

Employee Stock Purchase Plan

On July 26, 2018, our Board of Directors approved the Aspen Technology, Inc. 2018 Employee Stock Purchase Plan (the "ESPP"), which provides for the issuance of up to 250,000 shares of common stock to participating employees. The ESPP is intended to be a qualified employee stock purchase plan under Section 423 of the Internal Revenue Code of 1986, or the IRC. The ESPP was approved at our Annual Meeting of Stockholders on December 7, 2018. The ESPP currently provides for a purchase price equal to 85% of the lower of (a) the fair market value of the common stock on the first trading day of each ESPP offering period and (b) the fair market value of the common stock on the last day of the offering period. Our initial offering period was for January 1, 2019 through June 30, 2019.

During the six months ended June 30, 2019, we recorded stock-based compensation expense of approximately \$0.3 million associated with the ESPP. As a result of employee stock purchases during fiscal 2019, we issued 13,039 shares of common stock. The aggregate intrinsic value of shares issued under the ESPP during fiscal 2019 was \$0.9 million. As of June 30, 2019, there were 236,961 shares of common stock available for issuance under the ESPP.

General Award Terms

We issue stock options and restricted stock units (RSUs) to our employees and outside directors, pursuant to shareholder-approved equity compensation plans. Option awards are granted with an exercise price equal to the market closing price of our stock on the trading day prior to the grant date. Those options generally vest over four years and expire within 7 or 10 years of grant. RSUs generally vest over four years. Historically, our practice has been to settle stock option exercises and RSU vesting through newly-issued shares.

Stock Compensation Accounting

Our stock-based compensation is accounted for as awards of equity instruments. Our policy is to issue new shares upon the exercise of stock awards.

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We utilize the Black-Scholes option valuation model for estimating the fair value of options granted. The Black-Scholes option valuation model incorporates assumptions regarding expected stock price volatility, the expected life of the option, the risk-free interest rate, dividend yield and the market value of our common stock. The expected stock price volatility is determined based on our stock's historic prices over a period commensurate with the expected life of the award. The expected life of an option represents the period for which options are expected to be outstanding as determined by historic option exercises and cancellations. The risk-free interest rate is based on the U.S. Treasury yield curve for notes with terms approximating the expected life of the options granted. The expected dividend yield is zero, based on our history and expectation of not paying dividends on common shares. We recognize compensation costs on a straight-line basis, net of forfeitures, over the requisite service period for time-vested awards.

The weighted average estimated fair value of option awards granted during fiscal 2019, 2018 and 2017 was \$31.25, \$17.07, and \$13.16, respectively.

We utilized the Black-Scholes option valuation model with the following weighted average assumptions:

	Year Ended June 30,		
	2019	2018	2017
Risk-free interest rate	2.8%	1.7%	1.2%
Expected dividend yield	None	None	None
Expected life (in years)	4.6	4.6	4.6
Expected volatility factor	26.6%	28.0%	31.3%

The stock-based compensation expense and its classification in the accompanying consolidated statements of operations for fiscal 2019, 2018 and 2017 was as follows:

	Year Ended June 30,		
	2019	2018	2017
	As Adjusted		As Adjusted
	(Dollars in Thousands)		
Recorded as expenses:			
Cost of maintenance	\$ 1,282	\$ 559	\$ 564
Cost of service and other	1,420	920	913
Selling and marketing	4,849	3,862	3,652
Research and development	6,923	7,617	5,806
General and administrative	13,099	9,730	7,865
Total stock-based compensation	\$ 27,573	\$ 22,688	\$ 18,800

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A summary of stock option and RSU activity under all equity plans in fiscal 2019 is as follows:

	Stock Options				Restricted Stock Units	
	Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term	Aggregate Intrinsic Value (in 000's)	Shares	Weighted Average Grant Date Fair Value
Outstanding at June 30, 2018	1,369,442	\$ 45.93	7.23	\$ 64,103	621,700	\$ 53.64
Granted	282,798	113.88			645,146	114.72
Settled (RSUs)					(392,364)	60.51
Exercised	(252,975)	39.24				
Cancelled / Forfeited	(95,248)	68.25			(80,764)	68.58
Outstanding at June 30, 2019	1,304,017	\$ 60.33	6.94	\$ 83,388	793,718	\$ 98.38
Exercisable at June 30, 2019	842,746	\$ 48.81	6.11	\$ 63,598		
Vested and expected to vest at June 30, 2019	1,249,802	\$ 59.52	6.87	\$ 80,935	748,240	\$ 99.36

During fiscal 2019, 2018 and 2017, the weighted average grant-date fair value of RSUs granted was \$114.72, \$64.32 and \$46.59, respectively. During fiscal 2019, 2018 and 2017 the total fair value of vested shares from RSU grants amounted to \$39.9 million, \$23.0 million and \$16.6 million, respectively.

As of June 30, 2019, the total future unrecognized compensation cost related to stock options and RSUs was \$8.4 million and \$26.2 million, respectively, and are expected to be recorded over a weighted average period of 2.47 years and 2.44 years, respectively.

During fiscal 2019, 2018 and 2017 the weighted average exercise price of stock options granted was \$113.88, \$64.30 and \$46.31. The total intrinsic value of options exercised during fiscal 2019, 2018 and 2017 was \$18.2 million, \$15.1 million and \$7.9 million, respectively. We received \$10.9 million, \$13.5 million and \$9.3 million in cash proceeds from issuances of shares of common stock during fiscal 2019, 2018 and 2017, respectively. We paid \$14.7 million, \$8.1 million and \$5.8 million for withholding taxes on vested RSUs during fiscal 2019, 2018 and 2017, respectively.

At June 30, 2019, common stock reserved for future issuance or settlement under equity compensation plans was 9.7 million shares.

Performance Awards

During fiscal 2019, we granted performance-based long-term incentive awards (“performance awards”) to certain of our executives, including our named executive officers. The performance period for each performance award is either of the following two-year periods: (i) fiscal year 2019 - fiscal year 2020, or (ii) fiscal year 2020 - fiscal year 2021. Participants receive RSUs on the grant date associated with achievement of all performance targets. The performance targets for the performance awards are based on meeting double digit growth in annual spend, defined as an estimate of the annualized value of our portfolio of term license arrangements, as of a specific date, and the performance goals set out in the executive bonus plan for each fiscal year, such as free cash flow. If the performance targets are met during one of the two performance periods and the participant remains actively employed by us, the RSUs convert to time-based vesting wherein fifty percent of the awards immediately vest, and the remaining fifty percent are subject to additional service vesting over a three-year period. In general, if the performance targets are not met, or if the participant is no longer actively employed by us prior to the performance targets being met, the participant forfeits all of the RSUs.

We record compensation expense for the performance awards based on the fair value of the awards, in an amount proportionate to the service time rendered by the participant, when it is probable that the achievement of the goals will be met. The total fair value of the performance awards granted during fiscal 2019 was estimated using the closing price on the date of grant as well as the estimated probable achievement levels of the performance metrics. If the performance-based conditions are not met, no compensation cost is recognized and any recognized compensation cost is reversed.

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

During fiscal 2019, we granted 382,373 RSUs in connection with the performance awards. As of June 30, 2019, all of the RSUs issued in connection with the performance awards were unvested and outstanding. No compensation expense was recognized during fiscal 2019.

On August 2, 2019, 60,680 RSUs in connection with the performance awards were forfeited associated with the departure of an executive.

(13) Common Stock

On January 22, 2015, our Board of Directors approved a share repurchase program (the "Share Repurchase Program") for up to \$450.0 million worth of our common stock. On April 26, 2016, June 8, 2017, April 18, 2018, December 6, 2018, and April 17, 2019, the Board of Directors approved a \$400.0 million, \$200.0 million, \$200.0 million, \$100.0 million, and \$200.0 million increase in the Share Repurchase Program, respectively. The timing and amount of any shares repurchased are based on market conditions and other factors. All shares of our common stock repurchased have been recorded as treasury stock under the cost method.

During fiscal 2019, we repurchased 3,074,127 shares of our common stock in the open market for \$300.0 million. During fiscal 2018, we repurchased 2,797,623 shares of our common stock in the open market for \$200.0 million. During fiscal 2017, we repurchased 5,185,257 shares of our common stock in the open market for \$275.0 million and 2,106,709 shares of our common stock for \$100.0 million as part of an accelerated share repurchase program.

As of June 30, 2019, the remaining dollar value under the Share Repurchase Program was \$346.3 million.

(14) Net Income Per Share

Basic income per share is determined by dividing net income by the weighted average common shares outstanding during the period. Diluted income per share is determined by dividing net income by diluted weighted average shares outstanding during the period. Diluted weighted average shares reflect the dilutive effect, if any, of potential common shares. To the extent their effect is dilutive, employee equity awards and other commitments to be settled in common stock are included in the calculation of diluted net income per share based on the treasury stock method.

The calculations of basic and diluted net income per share and basic and dilutive weighted average shares outstanding for the years ended June 30, 2019, 2018 and 2017 are as follows:

	Year Ended June 30,		
	2019	2018	2017
		As Adjusted	As Adjusted
	(Dollars and Shares in Thousands, Except per Share Data)		
Net income	\$ 262,734	\$ 293,703	\$ 179,386
Weighted average shares outstanding	69,925	72,140	76,491
Dilutive impact from:			
Employee equity awards	862	816	487
Dilutive weighted average shares outstanding	70,787	72,956	76,978
Income per share			
Basic	\$ 3.76	\$ 4.07	\$ 2.35
Dilutive	\$ 3.71	\$ 4.03	\$ 2.33

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

For the years ended June 30, 2019, 2018 and 2017, certain employee equity awards were anti-dilutive based on the treasury stock method. The following employee equity awards were excluded from the calculation of dilutive weighted average shares outstanding because their effect would be anti-dilutive as of the balance sheet date:

	Year Ended June 30,		
	2019	2018	2017
	(Shares in Thousands)		
Employee equity awards	784	419	525

Included in the table above are options to purchase 245,252 shares of our common stock as of June 30, 2019 which were not included in the computation of dilutive weighted average shares outstanding, because their exercise prices ranged from \$103.19 per share to \$123.56 per share and were greater than the average market price of our common stock during the period then ended. These options were outstanding as of June 30, 2019 and expire at various dates through June 23, 2029.

(15) Income Taxes

Income before provision for income taxes consists of the following:

	Year Ended June 30,		
	2019	2018	2017
	As Adjusted (Dollars in Thousands)		
Domestic	\$ 298,665	\$ 229,745	\$ 228,890
Foreign	4,525	7,901	8,293
Income before provision for income taxes	<u>\$ 303,190</u>	<u>\$ 237,646</u>	<u>\$ 237,183</u>

The provision for income taxes shown in the accompanying consolidated statements of operations is composed of the following:

	Year Ended June 30,		
	2019	2018	2017
	As Adjusted (Dollars in Thousands)		
Federal—			
Current	\$ 64,194	\$ 47,734	\$ 69,385
Deferred	(26,983)	(108,867)	(13,110)
State—			
Current	3,246	1,471	1,737
Deferred	(1,026)	1,042	(771)
Foreign—			
Current	1,549	2,296	2,067
Deferred	(524)	267	(1,511)
	<u>\$ 40,456</u>	<u>\$ (56,057)</u>	<u>\$ 57,797</u>

On December 22, 2017, the President of the United States signed into law Public Law No. 115-97, commonly referred to as the Tax Cuts and Jobs Act (the "Tax Act"), following its passage by the United States Congress. The Tax Act made significant changes to U.S. federal income tax laws, including reduction of the corporate tax rate from 35.0% to 21.0%, and the implementation of a territorial tax system resulting in a one-time transition tax on the unremitted earnings of our foreign subsidiaries. The Tax Act also contains additional provisions that are effective for us in fiscal year 2019, including a new deduction for Foreign-Derived Intangible Income ("FDII"), the repeal of the domestic production activity deduction, a new tax on Global Intangible Low-Taxed Income ("GILTI"), and increased limitations on the deductibility of certain executive compensation.

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Our tax expense for fiscal 2019 was favorably impacted primarily by FDII deduction which reduced our effective tax rate by approximately 6.7%, the recognition of excess tax benefits related to stock-based compensation and the lower U.S. statutory tax rate of 21.0% as the result of the enactment of the Tax Act.

The provision for income taxes differs from that based on the federal statutory rate due to the following:

	Year Ended June 30,		
	2019	2018	2017
		As Adjusted (Dollars in Thousands)	As Adjusted
Federal tax provision at statutory rate	\$ 63,670	\$ 66,683	\$ 83,014
State income taxes	1,540	1,503	1,167
Remeasurement of deferred taxes	—	(115,536)	—
Foreign-derived intangible income (FDII)	(20,326)	—	—
Global intangible low-taxed income (GILTI)	797	—	—
Effect of foreign operations	7,395	4,700	2,912
Foreign taxes and rate differences	514	(164)	(206)
Stock-based compensation	(3,774)	(2,951)	991
Tax credits	(9,677)	(7,913)	(6,614)
Uncertain tax positions	1,055	(185)	(19,645)
Return to provision adjustments	(482)	(488)	464
Domestic production activity deduction	—	(4,869)	(6,261)
Valuation allowance	(550)	2,326	1,522
Other	294	837	453
Provision for income taxes	<u>\$ 40,456</u>	<u>\$ (56,057)</u>	<u>\$ 57,797</u>

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Net deferred tax liabilities consist of the following at June 30, 2019 and 2018:

	Year Ended June 30,	
	2019	2018
	As Restated	
	(Dollars in Thousands)	
Deferred tax assets:		
Federal and state credits	\$ 4,055	\$ 4,363
Capital loss carryforwards	—	4,856
Net operating loss carryforwards	906	1,452
Deferred revenue	5,252	3,163
Other reserves and accruals	6,082	6,550
Intangible assets	1,020	1,015
Property, leasehold improvements, and other basis differences	1,433	1,646
Other temporary differences	453	450
	<u>19,201</u>	<u>23,495</u>
Deferred tax liabilities:		
Contract assets and costs	(156,346)	(121,631)
Deferred revenue	(8,610)	(68,546)
Intangible assets	(5,635)	(5,231)
Property, leasehold improvements, and other basis differences	(1,146)	(1,340)
	<u>(171,737)</u>	<u>(196,748)</u>
Valuation allowance	(4,866)	(10,416)
Net deferred tax liabilities	<u>\$ (157,402)</u>	<u>\$ (183,669)</u>

Reflected in the deferred tax assets above at June 30, 2019, we have foreign net operating loss carryforwards of \$0.9 million, some of which will expire beginning in 2019 and others with unlimited carryforwards, and state research and development credits of \$4.0 million which begin to expire in 2025.

We adopted ASU No. 2016-09 effective July 1, 2017. As a result of adopting the new standard, excess tax benefits from stock-based compensation are now reflected in the consolidated statements of operations as a component of the provision for income taxes, whereas they were previously a component of stockholders' equity. The adoption of ASU No. 2016-09 resulted in a decrease in our provision for income taxes of \$3.8 million and \$3.0 million during fiscal 2019 and 2018, respectively. This represents a decrease in our effective tax rate of approximately one percentage point during fiscal 2019 and 2018, respectively, due to the recognition of excess tax benefits for options exercised and the vesting of equity awards.

Our valuation allowance for deferred tax assets was \$4.9 million and \$10.4 million as of June 30, 2019 and 2018 respectively. The most significant portion of the valuation allowance as of June 30, 2019 is attributable to a reserve against state R&D tax credits of \$3.9 million. There was a decrease in the valuation allowance of \$4.8 million during fiscal 2019 related to a capital loss expiring that had no impact on our tax provision.

For fiscal 2019, our income tax provision included amounts determined under the provisions of ASC 740 intended to satisfy additional income tax assessments, including interest and penalties, that could result from any tax return positions for which the likelihood of sustaining the position on audit does not meet a threshold of "more likely than not." Tax liabilities were recorded as a component of our income taxes payable and other non-current liabilities. The ultimate amount of taxes due will not be known until examinations are completed and settled or the audit periods are closed by statutes.

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

A reconciliation of the reserve for uncertain tax positions is as follows:

	Year Ended June 30,		
	2019	2018	2017
		As Adjusted	As Adjusted
		(Dollars in Thousands)	
Uncertain tax positions, beginning of year	\$ 3,931	\$ 3,921	\$ 23,535
Gross increases (decreases) —tax positions in prior period	407	544	(19,116)
Gross increases—tax positions in current period	1,789	—	—
Gross decreases—lapse of statutes	(740)	(637)	(830)
Currency translation adjustment	(7)	103	332
Uncertain tax positions, end of year	<u>\$ 5,380</u>	<u>\$ 3,931</u>	<u>\$ 3,921</u>

At June 30, 2019, the total amount of unrecognized tax benefits is \$5.4 million. Upon being recognized, the amount would reduce the effective tax rate. Our policy is to recognize interest and penalties related to income tax matters as provision for (benefit from) income taxes. At June 30, 2019, we had approximately \$0.5 million of accrued interest and \$0.1 million of penalties related to uncertain tax positions. We recorded a benefit for interest and penalties of approximately \$0.1 million during fiscal 2019.

We are subject to income tax in many jurisdictions outside the U.S. Our operations in certain jurisdictions remain subject to examination for tax years 2008 to 2017, some of which are currently under audit by local tax authorities. The resolutions of these audits are not expected to be material to our consolidated financial statements.

(16) Commitments and Contingencies
Operating Leases

We lease certain facilities and various office equipment under non-cancellable operating leases with terms in excess of one year. Rental expense, including short term leases, maintenance charges and taxes on leased facilities, was approximately \$8.3 million, \$8.2 million and \$8.4 million for fiscal years 2019, 2018 and 2017, respectively.

Future minimum lease payments under these leases as of June 30, 2019 are as follows:

Year Ended June 30,	Operating Leases
	(Dollars in Thousands)
2020	\$ 8,399
2021	7,820
2022	6,514
2023	5,862
2024	4,932
Thereafter	3,307
Total	<u>\$ 36,834</u>

Letters of Credit

Standby letters of credit for \$3.9 million secure our performance on professional services contracts and certain facility leases. The letters of credit expire at various dates through fiscal 2025.

(17) Retirement Plans

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

We maintain a defined contribution retirement plan under Section 401(k) of the Internal Revenue Code (IRC) covering all eligible employees, as defined. Under the plan, a participant may elect to defer receipt of a stated percentage of his or her compensation, subject to limitation under the IRC, which would otherwise be payable to the participant for any plan year. We may make discretionary contributions to this plan, including making matching contributions of 50%, up to a maximum of 6% of an employee's pretax contribution. We made matching contributions of approximately \$2.6 million, \$2.7 million and \$2.5 million in fiscal 2019, 2018 and 2017, respectively. Additionally, we participate in certain government mandated and defined contribution plans throughout the world for which we comply with all funding requirements.

(18) Segment and Geographic Information

Operating segments are defined as components of an enterprise that engage in business activities for which discrete financial information is available and regularly reviewed by the chief operating decision maker in deciding how to allocate resources and to assess performance. Our chief operating decision maker is our President and Chief Executive Officer.

We have two operating and reportable segments, which are consistent with our reporting units: i) subscription and software and ii) services and other. The subscription and software segment is engaged in the licensing of process optimization and asset performance management software solutions and associated support services, and includes our license and maintenance revenue. The services and other segment includes professional services and training, and includes our services and other revenue. We do not track assets or capital expenditures by operating segments. Consequently, it is not practical to present assets, capital expenditures, depreciation or amortization by operating segments

The following table presents a summary of our reportable segments' profits:

	<u>Subscription and Software</u>	<u>Services and Other</u>	<u>Total</u>
	(Dollars in Thousands)		
Year Ended June 30, 2019:			
Segment revenue	\$ 569,558	\$ 28,787	\$ 598,345
Segment expenses(1)	(220,764)	(31,548)	(252,312)
Segment profit	<u>\$ 348,794</u>	<u>\$ (2,761)</u>	<u>\$ 346,033</u>
Year Ended June 30, 2018, As Adjusted:			
Segment revenue	\$ 487,614	\$ 31,245	\$ 518,859
Segment expenses(1)	(204,457)	(28,000)	(232,457)
Segment profit	<u>\$ 283,157</u>	<u>\$ 3,245</u>	<u>\$ 286,402</u>
Year Ended June 30, 2017, As Adjusted:			
Segment revenue	\$ 464,271	\$ 30,156	\$ 494,427
Segment expenses(1)	(192,559)	(26,414)	(218,973)
Segment profit	<u>\$ 271,712</u>	<u>\$ 3,742</u>	<u>\$ 275,454</u>

- (1) Our reportable segments' operating expenses include expenses directly attributable to the segments. Segment expenses include selling and marketing and research and development expenses. Segment expenses do not include allocations of general and administrative expense; interest income, net; and other (expense), net.

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Reconciliation to Income Before Income Taxes

The following table presents a reconciliation of total segment operating profit to income before provision for income taxes:

	Year Ended June 30,		
	2019	2018	2017
	As Adjusted		As Adjusted
	(Dollars in Thousands)		
Total segment profit for reportable segments	\$ 346,033	\$ 286,402	\$ 275,454
General and administrative	(63,231)	(67,181)	(58,735)
Interest income	28,457	24,954	22,942
Interest (expense)	(8,733)	(5,691)	(3,787)
Other (expense) income, net	664	(838)	1,309
Income before income taxes	<u>\$ 303,190</u>	<u>\$ 237,646</u>	<u>\$ 237,183</u>

Geographic Information:

We have long-lived assets of approximately \$79.0 million that are located domestically and \$44.5 million that reside in other geographic locations as of June 30, 2019. We had long-lived assets of approximately \$93.9 million that were located domestically and \$39.8 million that reside in other geographic locations as of June 30, 2018.

(19) Quarterly Financial Data (Unaudited)

The following tables present quarterly consolidated statement of operations data for fiscal 2019 and 2018. The below data is unaudited but, in our opinion, reflects all adjustments necessary for a fair presentation of this data in accordance with GAAP:

	Three Months Ended			
	June 30, 2019	March 31, 2019	December 31, 2018	September 30, 2018
	(Dollars and Shares in Thousands, Except per Share Data)			
Total revenue	\$ 195,769	\$ 147,984	\$ 140,423	\$ 114,169
Gross profit	180,279	133,624	125,684	100,942
Income from operations	111,223	70,831	63,758	36,990
Net income	103,865	61,587	59,217	38,066
Net income per common share:				
Basic	\$ 1.51	\$ 0.89	\$ 0.84	\$ 0.54
Diluted	\$ 1.49	\$ 0.88	\$ 0.83	\$ 0.53
Weighted average shares outstanding:				
Basic	68,839	69,423	70,428	70,988
Diluted	69,638	70,160	71,148	72,015

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

	Three Months Ended			
	June 30, 2018	March 31, 2018	December 31, 2017	September 30, 2017
	As Adjusted (Dollars and Shares in Thousands, Except per Share Data)			
Total revenue	\$ 159,084	\$ 127,759	\$ 105,529	\$ 126,487
Gross profit	146,037	114,983	93,440	113,755
Income from operations	79,784	53,620	30,104	55,714
Net income	76,646	44,506	132,030	40,521
Net income per common share:				
Basic	\$ 1.07	\$ 0.62	\$ 1.83	\$ 0.55
Diluted	\$ 1.06	\$ 0.61	\$ 1.81	\$ 0.55
Weighted average shares outstanding:				
Basic	71,349	71,828	72,342	73,024
Diluted	72,315	72,663	73,036	73,609

Restatement of the Fiscal 2019 Unaudited Quarterly Financial Statements

As previously described in our Current Report on Form 8-K filed on September 10, 2019, we concluded that our unaudited interim financial statements previously issued for the quarterly and year-to-date periods ended September 30, 2018, December 31, 2018 and March 31, 2019 should not be relied upon due to errors identified in such financial statements related to the contract asset balances recorded upon the adoption of Topic 606 and the related impact to deferred tax liabilities, as well as the classification of contract cost assets and related deferred tax assets and liabilities on the consolidated balance sheets. The following summarizes the errors corrected in the restatement of the unaudited quarterly financial statements.

**ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS
(Unaudited)**

	June 30, 2018		
	As Previously Reported	Adjustments	As Restated
	(Dollars in Thousands, Except Share and Per Share Data)		
ASSETS			
Current assets:			
Cash and cash equivalents	\$ 96,165	\$ —	\$ 96,165
Accounts receivable, net	41,810	—	41,810
Current contract assets	304,378	(66,841)	237,537
Current contract costs	20,500	(20,500)	—
Prepaid expenses and other current assets	10,509	—	10,509
Prepaid income taxes	2,601	—	2,601
Total current assets	475,963	(87,341)	388,622
Property, equipment and leasehold improvements, net	9,806	—	9,806
Computer software development costs, net	646	—	646
Goodwill	75,590	—	75,590
Intangible assets, net	35,310	—	35,310

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Non-current contract assets	340,622	(20,782)	319,840
Non-current contract costs	—	20,500	20,500
Non-current deferred tax assets	11,090	(9,858)	1,232
Other non-current assets	1,297	—	1,297
Total assets	\$ 950,324	\$ (97,481)	\$ 852,843
LIABILITIES AND STOCKHOLDERS' EQUITY			
Current liabilities:			
Accounts payable	\$ 4,230	\$ —	\$ 4,230
Accrued expenses and other current liabilities	39,515	—	39,515
Income taxes payable	1,698	—	1,698
Borrowings under credit agreement	170,000	—	170,000
Current deferred revenue	15,150	—	15,150
Total current liabilities	230,593	—	230,593
Non-current deferred revenue	12,354	—	12,354
Deferred income taxes	214,125	(29,224)	184,901
Other non-current liabilities	17,068	—	17,068
Commitments and contingencies			
Series D redeemable convertible preferred stock, \$0.10 par value—			
Authorized—3,636 shares as of June 30, 2018 and 2017			
Issued and outstanding—none as of June 30, 2018 and 2017			
Stockholders' equity:			
Common stock, \$0.10 par value—Authorized—210,000,000 shares			
Issued—103,130,300 shares at June 30, 2018 and 102,567,129 shares at June 30, 2017			
Outstanding—71,186,701 shares at June 30, 2018 and 73,421,153 shares at June 30, 2017			
	10,313	—	10,313
Additional paid-in capital	715,475	—	715,475
Retained earnings	1,065,507	(68,257)	997,250
Accumulated other comprehensive income	1,388	—	1,388
Treasury stock, at cost— 31,943,599 shares of common stock at June 30, 2018 and 29,145,976 shares at June 30, 2017	(1,316,499)	—	(1,316,499)
Total stockholders' equity	476,184	(68,257)	407,927
Total liabilities and stockholders' equity	\$ 950,324	\$ (97,481)	\$ 852,843

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS
(Unaudited)

	September 30, 2018		
	As Previously Reported	Adjustments	As Restated
(Dollars in Thousands, Except Share and Per Share Data)			
ASSETS			
Current assets:			
Cash and cash equivalents	\$ 52,048	\$ —	\$ 52,048
Accounts receivable, net	53,999	(3,653)	50,346

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Current contract assets	317,967	(79,472)	238,495
Current contract costs	21,296	(21,296)	—
Prepaid expenses and other current assets	12,992	—	12,992
Prepaid income taxes	1,422	—	1,422
Total current assets	459,724	(104,421)	355,303
Property, equipment and leasehold improvements, net	9,006	—	9,006
Computer software development costs, net	695	—	695
Goodwill	75,649	—	75,649
Intangible assets, net	34,192	—	34,192
Non-current contract assets	357,947	(4,498)	353,449
Non-current contract costs	—	21,296	21,296
Non-current deferred tax assets	1,176	—	1,176
Other non-current assets	1,279	—	1,279
Total assets	\$ 939,668	\$ (87,623)	\$ 852,045
LIABILITIES AND STOCKHOLDERS' EQUITY			
Current liabilities:			
Accounts payable	\$ 2,501	\$ —	\$ 2,501
Accrued expenses and other current liabilities	32,000	—	32,000
Income taxes payable	46,869	—	46,869
Borrowings under credit agreement	170,000	—	170,000
Current deferred revenue	23,737	—	23,737
Total current liabilities	275,107	—	275,107
Non-current deferred revenue	15,046	—	15,046
Deferred income taxes	159,563	(19,366)	140,197
Other non-current liabilities	16,833	—	16,833
Commitments and contingencies			
Series D redeemable convertible preferred stock, \$0.10 par value—			
Authorized—3,636 shares as of September 30, 2018 and June 30, 2018			
Issued and outstanding—none as of September 30, 2018 and June 30, 2018			
	—	—	—
Stockholders' equity:			
Common stock, \$0.10 par value—Authorized—210,000,000 shares			
Issued—103,279,138 shares at September 30, 2018 and 103,130,300 shares at June 30, 2018			
Outstanding—70,862,163 shares at September 30, 2018 and 71,186,701 shares at June 30, 2018			
	10,328	—	10,328
Additional paid-in capital	724,752	—	724,752
Retained earnings	1,103,573	(68,257)	1,035,316
Accumulated other comprehensive income	965	—	965
Treasury stock, at cost— 32,416,975 shares of common stock at September 30, 2018 and 31,943,599 shares at June 30, 2018			
	(1,366,499)	—	(1,366,499)
Total stockholders' equity	473,119	(68,257)	404,862
Total liabilities and stockholders' equity	\$ 939,668	\$ (87,623)	\$ 852,045

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS
(Unaudited)

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

	December 31, 2018		
	As Previously Reported	Adjustments	As Restated
(Dollars in Thousands, Except Share and Per Share Data)			
ASSETS			
Current assets:			
Cash and cash equivalents	\$ 54,428	\$ —	\$ 54,428
Accounts receivable, net	56,586	(3,653)	52,933
Current contract assets	321,135	(55,449)	265,686
Current contract costs	23,046	(23,046)	—
Prepaid expenses and other current assets	10,330	—	10,330
Prepaid income taxes	921	—	921
Total current assets	466,446	(82,148)	384,298
Property, equipment and leasehold improvements, net	8,311	—	8,311
Computer software development costs, net	691	—	691
Goodwill	74,802	—	74,802
Intangible assets, net	32,889	—	32,889
Non-current contract assets	366,581	(28,521)	338,060
Non-current contract costs	—	23,046	23,046
Non-current deferred tax assets	1,651	—	1,651
Other non-current assets	1,075	—	1,075
Total assets	\$ 952,446	\$ (87,623)	\$ 864,823
LIABILITIES AND STOCKHOLDERS' EQUITY			
Current liabilities:			
Accounts payable	\$ 5,249	\$ —	\$ 5,249
Accrued expenses and other current liabilities	36,688	—	36,688
Income taxes payable	43,573	—	43,573
Borrowings under credit agreement	220,000	—	220,000
Current deferred revenue	23,145	—	23,145
Total current liabilities	328,655	—	328,655
Non-current deferred revenue	18,167	—	18,167
Deferred income taxes	157,238	(19,366)	137,872
Other non-current liabilities	16,192	—	16,192
Commitments and contingencies			
Series D redeemable convertible preferred stock, \$0.10 par value—			
Authorized—3,636 shares as of December 31, 2018 and June 30, 2018			
Issued and outstanding—none as of December 31, 2018 and June 30, 2018			
	—	—	—
Stockholders' equity:			
Common stock, \$0.10 par value—Authorized—210,000,000 shares			
Issued—103,395,683 shares at December 31, 2018 and 103,130,300 shares at June 30, 2018			
Outstanding—69,803,177 shares at December 31, 2018 and 71,186,701 shares at June 30, 2018			
	10,340	—	10,340
Additional paid-in capital	725,493	—	725,493
Retained earnings	1,162,790	(68,257)	1,094,533

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Accumulated other comprehensive income	70	—	70
Treasury stock, at cost— 33,592,506 shares of common stock at December 31, 2018 and 31,943,599 shares at June 30, 2018	(1,466,499)	—	(1,466,499)
Total stockholders' equity	432,194	(68,257)	363,937
Total liabilities and stockholders' equity	\$ 952,446	\$ (87,623)	\$ 864,823

**ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS
(Unaudited)**

	March 31, 2019		
	As Previously Reported	Adjustments	As Restated
(Dollars in Thousands, Except Share and Per Share Data)			
ASSETS			
Current assets:			
Cash and cash equivalents	\$ 65,592	\$ —	\$ 65,592
Accounts receivable, net	45,293	(3,653)	41,640
Current contract assets	314,745	(44,013)	270,732
Current contract costs	24,325	(24,325)	—
Prepaid expenses and other current assets	11,124	—	11,124
Prepaid income taxes	1,573	—	1,573
Total current assets	462,652	(71,991)	390,661
Property, equipment and leasehold improvements, net	7,589	—	7,589
Computer software development costs, net	1,452	—	1,452
Goodwill	73,534	—	73,534
Intangible assets, net	31,756	—	31,756
Non-current contract assets	358,709	(39,957)	318,752
Non-current contract costs	—	24,325	24,325
Non-current deferred tax assets	1,696	—	1,696
Other non-current assets	1,279	—	1,279
Total assets	\$ 938,667	\$ (87,623)	\$ 851,044
LIABILITIES AND STOCKHOLDERS' EQUITY			
Current liabilities:			
Accounts payable	\$ 4,023	\$ —	\$ 4,023
Accrued expenses and other current liabilities	42,746	—	42,746
Income taxes payable	35,582	—	35,582
Borrowings under credit agreement	220,000	—	220,000
Current deferred revenue	24,415	—	24,415
Total current liabilities	326,766	—	326,766
Non-current deferred revenue	19,312	—	19,312
Deferred income taxes	154,901	(19,366)	135,535
Other non-current liabilities	12,403	—	12,403

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Commitments and contingencies

Series D redeemable convertible preferred stock, \$0.10 par value—

Authorized—3,636 shares as of March 31, 2019 and June 30, 2018

Issued and outstanding—none as of March 31, 2019 and June 30, 2018

— — —

Stockholders' equity:

Common stock, \$0.10 par value—Authorized—210,000,000 shares

Issued—103,478,590 shares at March 31, 2019 and 103,130,300 shares
at June 30, 2018Outstanding—69,108,515 shares at March 31, 2019 and 71,186,701
shares at June 30, 2018

10,348 — 10,348

Additional paid-in capital

730,830 — 730,830

Retained earnings

1,224,377 (68,257) 1,156,120

Accumulated other comprehensive income

1,229 — 1,229

Treasury stock, at cost— 34,370,075 shares of common stock at March
31, 2019 and 31,943,599 shares at June 30, 2018

(1,541,499) — (1,541,499)

Total stockholders' equity

425,285 (68,257) 357,028

Total liabilities and stockholders' equity

\$ 938,667 \$ (87,623) \$ 851,044

ASPEN TECHNOLOGY, INC. AND SUBSIDIARIES

SCHEDULE II - VALUATION AND QUALIFYING ACCOUNTS

Schedule II - Valuation and Qualifying Accounts

Description	Balance at Beginning of Year	Additions: Charges to Costs and Expenses	Deductions: Returns and Write-Offs	Balance at End of Year
(Dollars in Thousands)				
Year ended June 30, 2019				
Allowance for doubtful accounts	\$ (2,703)	\$ (1,621)	\$ 975	\$ (3,349)
Year ended June 30, 2018, As Adjusted				
Allowance for doubtful accounts	(1,285)	(2,463)	1,045	(2,703)
Year ended June 30, 2017, As Adjusted				
Allowance for doubtful accounts	(1,604)	(1,338)	1,657	(1,285)

EXHIBIT INDEX

Exhibit Number	Description	Filed with this Form 10-K	Incorporated by Reference		Exhibit Number
			Form	Filing Date with SEC(1)	
3.1	Certificate of Incorporation of Aspen Technology, Inc., as amended		8-K	August 22, 2003	4
3.2	Amended and Restated By-laws of Aspen Technology, Inc.		8-K	October 24, 2016	3.1
4.1	Specimen certificate for common stock, \$.10 par value, of Aspen Technology, Inc.		8-A/A	June 12, 1998	4
10.1	Lease Agreement dated January 27, 2014 between RAR2-Crosby Corporate Center QRS, Inc. and Aspen Technology, Inc. regarding 20, 22 and 28 Crosby Drive, Bedford, Massachusetts		10-Q	January 30, 2014	10.1
10.2	System License Agreement dated March 30, 1982 between Aspen Technology, Inc. and the Massachusetts Institute of Technology		10-K	April 11, 2008	10.4
10.3	Amendment dated March 30, 1982 to System License Agreement dated March 30, 1982 between Aspen Technology, Inc. and the Massachusetts Institute of Technology		10-K	April 11, 2008	10.5
10.4	Rule 2.7 Announcement, dated January 12, 2016		8-K	January 19, 2016	2.1
10.5	364-Day Bridge Credit Agreement, dated as of January 12, 2016, among Aspen Technology, Inc., as borrower, the lenders party thereto, JPMorgan Chase Bank, N.A., as administrative agent, and J.P. Morgan Securities LLC, as sole lead arranger and sole bookrunner		8-K	January 19, 2016	10.1
10.6	Credit Agreement, dated as of February 26, 2016, among Aspen Technology, Inc., as borrower, the lenders, co-documentation agents and issuing banks party thereto, JPMorgan Chase Bank, N.A., as administrative agent, joint lead arranger and joint bookrunner, and Silicon Valley Bank, as syndication agent, joint lead arranger and joint bookrunner		8-K	February 29, 2016	10.1
10.7	Incremental Facility Amendment, dated as of August 9, 2017, to the Credit Agreement dated as of February 26, 2016 among Aspen Technology, Inc. as borrower, the lenders, JPMorgan Chase Bank, N.A. as administrative agent and issuing bank, and certain other Lenders acting in such capacity from time to time, as issuing banks		10-K	August 10, 2017	10.7
10.8	Master Confirmation-Accelerated Share Repurchase Dated August 29, 2016, with J.P. Morgan Securities, as agent for JP Morgan Chase Bank		8-K	August 30, 2016	10.1

Exhibit Number	Description	Filed with this Form 10-K	Incorporated by Reference		
			Form	Filing Date with SEC(1)	Exhibit Number
10.9	Stock Purchase Agreement dated October 26, 2016 by and among AspenTech Holding Corporation, Mtelligence Corporation, each of the stockholders and key sellers of Mtelligence Corporation, and Cito Capital Corporation		10-Q	October 27, 2016	10.4
10.10^	Aspen Technology, Inc. 2010 Equity Incentive Plan		8-K	April 21, 2010	10.1
10.11^	Form of Terms and Conditions of Restricted Stock Unit Agreement granted under Aspen Technology, Inc. 2010 Equity Incentive Plan		10-K	September 2, 2010	10.42
10.12^	Form of Terms and Conditions of Stock Option Agreement Granted under Aspen Technology, Inc. 2010 Equity Incentive Plan		10-K	September 2, 2010	10.43
10.13^	Aspen Technology, Inc. 2016 Omnibus Incentive Plan		10-Q	October 27, 2016	10.4
10.14^	Form of Terms and Conditions of Restricted Stock Unit Agreement Granted Under Aspen Technology Inc. 2016 Omnibus Incentive Plan		10-Q	January 26, 2017	10.2
10.15^	Form of Terms and Conditions of Stock Option Agreement Granted Under Aspen Technology Inc. 2016 Omnibus Incentive Plan		10-Q	January 26, 2017	10.3
10.16^	Aspen Technology, Inc. Executive Annual Incentive Bonus Plan (Fiscal Year 2016)		8-K	July 24, 2015	10.1
10.17^	Aspen Technology, Inc. Executive Annual Bonus Plan (Fiscal Year 2017)		8-K	July 22, 2016	10.1
10.18^	Aspen Technology, Inc. Executive Annual Bonus Plan (Fiscal Year 2017) (Correction of the exhibit filed as Exhibit 10.1 of the 8-K filed on July 22, 2016, in which Growth in Annual Spend was referred to as Growth in License Annual Spend)		10-Q	October 27, 2016	10.3
10.19^	Aspen Technology, Inc. Executive Annual Incentive Bonus Plan (Fiscal Year 2018)		8-K	July 19, 2017	10.1
10.20^	Aspen Technology, Inc. Executive Annual Incentive Bonus Plan (Fiscal Year 2019)		8-K	July 27, 2018	10.1
10.21^	Aspen Technology, Inc. FY20 Executive Bonus Plan		8-K	July 26, 2019	10.1
10.22^	Letter agreement dated August 2, 2019 between Aspen Technology, Inc. and Gary M. Weiss		8-K	August 8, 2019	10.1
10.23^	Amended and Restated Executive Retention Agreement dated January 31, 2019 entered into by Aspen Technology, Inc. and Antonio J. Pietri		8-K	February 1, 2019	10.1

Exhibit Number	Description	Filed with this Form 10-K	Incorporated by Reference		Exhibit Number
			Form	Filing Date with SEC(1)	
10.24 [^]	Form of Amended and Restated Executive Retention Agreement dated January 31, 2019 entered into between Aspen Technology, Inc. and each of Gary M. Weiss, Karl E. Johnsen and Frederic G. Hammond		8-K	February 1, 2019	10.2
10.25 [^]	Form of Confidentiality and Non-Competition Agreement of Aspen Technology, Inc.		10-K	April 11, 2008	10.45
10.26 [^]	Non-Competition and Non-Solicitation Agreement dated July 1, 2013 entered into by Aspen Technology, Inc. and Antonio J. Pietri		10-K	August 15, 2013	10.30
21.1	Subsidiaries of Aspen Technology, Inc.		X		
23.1	Consent of KPMG LLP		X		
31.1	Certification of Principal Executive Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002		X		
31.2	Certification of Principal Financial Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002		X		
32.1*	Certification Pursuant to 18 U.S.C. Section 1350, As Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002		X		
101.INS	Instance Document		X		
101.SCH	XBRL Taxonomy Extension Schema Document		X		
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document		X		
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document		X		
101.LAB	XBRL Taxonomy Extension Label Linkbase Document		X		
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document		X		

(1) The SEC File No. is 000-24786 for Exhibits 3.1, 4.1, 10.2 through 10.3, 10.11 through 10.15, and 10.30, inclusive. The SEC File No. for all other exhibits is 001-34630.

[^] Management contract or compensatory plan or arrangement

* The certification attached as Exhibit 32.1 that accompanies this Form 10-K is not deemed filed with the SEC and is not to be incorporated by reference into any filing of Aspen Technology, Inc. under the Securities Act of 1933 or the Securities Exchange Act of 1934, whether made before or after the date of this Form 10-K, irrespective of any general incorporation language contained in such filing.

ASPEN TECHNOLOGY, INC.
List of Subsidiaries as of June 30, 2019

	Name of Subsidiary	State or Country of Incorporation
1	Apex Optimisation Technologies B.V.	Netherlands
2	Apex Optimisation UK Ltd.	United Kingdom
3	Apex Optimisation Ltd.	United Kingdom
4	Apex Optimisation Inc.	Delaware
5	Apex Optimisation SRO	Czech Republic
6	Aspen Tech de Mexico, S. de R.L. de C.V.	Mexico
7	Aspen Tech India Private Ltd.	India
8	Aspen Technology (Asia), Inc.	Delaware
9	Aspen Technology Australia Pty. Ltd.	Australia
10	Aspen Technology International, Inc.	Delaware
11	Aspen Technology LLC	Russia
12	Aspen Technology S.A.S.	Colombia
13	Aspen Technology S.L.	Spain
14	Aspen Technology Services Corporation	Delaware
15	AspenTech (Beijing) Ltd.	PRC
16	AspenTech (Shanghai) Ltd.	PRC
17	AspenTech (Thailand) Ltd.	Thailand
18	AspenTech Africa (Pty.) Ltd.	South Africa
19	AspenTech Argentina S.R.L.	Argentina
20	AspenTech Canada Corporation	Canada
21	AspenTech Canada Holdings, LLC	Delaware
22	AspenTech Europe B.V.	Netherlands
23	AspenTech Europe, S.A./N.V.	Belgium
24	AspenTech Holding Corporation	Delaware
25	AspenTech Japan Co. Ltd.	Japan
26	AspenTech Ltd.	United Kingdom
27	AspenTech Pte. Ltd.	Singapore
28	AspenTech S.r.l.	Italy
29	AspenTech Software Brasil Ltda.	Brazil
30	AspenTech Software Corporation	Delaware
31	AspenTech Solutions Sdn. Bhd.	Malaysia
32	AspenTech Venezuela C.A.	Venezuela
33	Hyprotech UK Ltd.	United Kingdom
34	Mtelligence Corporation	Delaware
35	The Fidelis Group, LLC	Texas
36	Argent & Waugh Ltd.	United Kingdom
37	Sabisu Ltd.	United Kingdom

Consent of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors

Aspen Technology, Inc.

We consent to the incorporation by reference in the registration statements (No. 333-128423, 333-169657, 333-215818, and 333-228978) on Form S-8 on Form of Aspen Technology, Inc. (the Company) of our reports dated September 10, 2019, with respect to the consolidated balance sheets of Aspen Technology, Inc. as of June 30, 2019 and 2018, the related consolidated statements of operations, comprehensive income, stockholders' equity, and cash flows for each of the years in the three-year period ended June 30, 2019, and the related notes and financial statement Schedule II-Valuation and Qualifying Accounts (collectively, the consolidated financial statements), and the effectiveness of internal control over financial reporting as of June 30, 2019, which reports appear in the June 30, 2019 annual report on Form 10-K of Aspen Technology, Inc.

Our report dated September 10, 2019, on the consolidated financial statements as of June 30, 2019 and 2018 and for each of the years in the three-year period ended June 30, 2019, refers to the Company's change in method of accounting for revenues and certain contract costs in fiscal 2019, 2018, and 2017 due to the adoption of Accounting Standards Update 2014-09, *Revenue from Contracts with Customers* (Topic 606).

Our report dated September 10, 2019, on the effectiveness of internal control over financial reporting as of June 30, 2019, expresses our opinion that the Company did not maintain effective internal control over financial reporting as of June 30, 2019 because of the effect of a material weakness on the achievement of the objectives of the control criteria and contains an explanatory paragraph that states a material weakness has been identified and included in management's assessment related to the ineffective design and implementation of control activities over the accuracy of the retrospective restatement of revenue and related contract balances recorded upon the adoption of ASC Topic 606, and the classification of contract cost assets and related deferred tax assets and liabilities on the consolidated balance sheet. The material weakness described above resulted from an ineffective risk assessment and the lack of timely creation of relevant reporting tools and information used to support the functioning of internal control.

/s/ KPMG LLP

Boston, Massachusetts
September 10, 2019

**CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER
PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002**

I, Antonio J. Pietri, certify that:

1. I have reviewed this Annual Report on Form 10-K of Aspen Technology, Inc.;
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 the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) 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 the registrant 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 the registrant, 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 the registrant'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 the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant'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 the registrant'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 the registrant's internal control over financial reporting.

Date: September 10, 2019

/s/ ANTONIO. J. PIETRI

Antonio J. Pietri
President and Chief Executive Officer
(Principal Executive Officer)

**CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER
PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002**

I, Karl E. Johnsen, certify that:

1. I have reviewed this Annual Report on Form 10-K of Aspen Technology, Inc.;
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 the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) 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 the registrant 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 the registrant, 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 the registrant'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 the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant'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 the registrant'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 the registrant's internal control over financial reporting.

Date: September 10, 2019

/s/ KARL E. JOHNSEN

Karl E. Johnsen
Senior Vice President and Chief Financial Officer
(Principal 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 on Form 10-K of Aspen Technology, Inc. (the "Company") for the year ended June 30, 2019, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), each of the undersigned hereby certifies in his capacity as an officer of the Company, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to his knowledge:

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

Date: September 10, 2019

/s/ ANTONIO J. PIETRI

Antonio J. Pietri
President and Chief Executive Officer

Date: September 10, 2019

/s/ KARL E. JOHNSEN

Karl E. Johnsen
Senior Vice President and Chief Financial Officer

A signed original of this written statement required by Section 906 has been provided to Aspen Technology, Inc. and will be retained by Aspen Technology, Inc. and furnished to the Securities and Exchange Commission or its staff upon request.