

PEGASYSTEMS INC
Form 10-K
February 20, 2019

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT of 1934
For the fiscal year ended December 31, 2018

OR

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

Commission File No. 1-11859

PEGASYSTEMS INC.
(Exact name of Registrant as specified in its charter)

Massachusetts 04-2787865
(State or other jurisdiction of incorporation or organization) (I.R.S. Employer Identification No.)

One Rogers Street, Cambridge, MA 02142-1209
(Address of principal executive offices) (Zip code)
(617) 374-9600
(Registrant's telephone number, including area code)

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

Title of Each Class	Name of Each Exchange on Which Registered
Common Stock, \$0.01 par value per share	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 Exchange Act. Yes No

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

Indicate by check mark whether the Registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the Registrant was required to submit such files). Yes No

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

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Indicate by check mark whether the Registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or emerging growth company. See the definitions of “large accelerated filer,” “accelerated filer,” “smaller reporting company,” and “emerging company,” in Rule 12b-2 of the Exchange Act.

Large accelerated filer Accelerated filer Non-accelerated filer Smaller reporting company Emerging growth company
x

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 Exchange Act). Yes No

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The aggregate market value of the Registrant's common stock held by non-affiliates, based upon the closing price of the Registrant's common stock on the NASDAQ Global Select Market of \$54.80, on June 29, 2018 was approximately \$2.1 billion.

There were 78,442,648 shares of the Registrant's common stock, \$0.01 par value per share, outstanding on February 14, 2019.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Registrant's definitive proxy statement related to its 2019 annual meeting of stockholders to be filed subsequently are incorporated by reference into Part III of this report.

PEGASYSTEMS INC.

ANNUAL REPORT ON FORM 10-K

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PART I

FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K (“Annual Report”), including without limitation, “Item 1. Business”, “Item 1A. Risk Factors”, “Item 5. Market for Registrant’s Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities”, and “Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations”, contains or incorporates forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, Section 21E of the Securities Exchange Act of 1934 and the Private Securities Litigation Reform Act of 1995. We claim the protection of the safe harbor for forward-looking statements contained in the Private Securities Litigation Reform Act of 1995 for all forward-looking statements.

These forward-looking statements are based on current expectations, estimates, forecasts, and projections about the industry and markets in which we operate, and management’s beliefs and assumptions. In addition, other written or oral statements that constitute forward-looking statements may be made by us or on our behalf. Words such as “expect,” “anticipate,” “intend,” “plan,” “believe,” “could,” “estimate,” “may,” “target,” “strategy,” “is intended to,” “project,” “guidance” or variations of such words and similar expressions are intended to identify such forward-looking statements.

They include, among other things, statements regarding:

- our future financial performance and business plans;
- the adequacy of our liquidity and capital resources;
- the continued payment of our quarterly dividends;
- the timing of revenue recognition under license and cloud arrangements;
- our expectations as to the amount of revenue we will recognize in future periods from existing client contracts;
- the expected benefits to our existing and potential clients of our product and service offerings;
- the growth of our business and revenues and our expectations about the factors that influence our success and trends in our business;
- our expectation that revenue will continue to shift in favor of our subscription offerings, particularly cloud arrangements;
- our pipeline of potential future client agreements;
- our expectations regarding the impact of recent accounting pronouncements on our consolidated financial statements;
- our expectation that our net deferred tax assets will be realized in the foreseeable future, that we have adequately provided under U.S. generally accepted accounting principles for uncertain tax benefits, and that the undistributed earnings of our international subsidiaries are considered permanently reinvested; and
- the exposure to foreign currency exchange rates and continued realization of gains or losses with respect to our foreign currency exposures.

Factors that could cause our actual results to differ from those expressed in forward-looking statements include, but are not limited to, those identified in “Item 1A. Risk Factors” of this Annual Report.

Investors are cautioned not to place undue reliance on such forward-looking statements and there are no assurances that the results contained in such statements will be achieved. Although new information, future events, or risks may cause actual results to differ materially from future results expressed or implied by such forward-looking statements, except as required by applicable law, we do not undertake and specifically disclaim any obligation to publicly update or revise these forward-looking statements whether as the result of new information, future events, or otherwise.

ITEM 1. BUSINESS

Our Business

We develop, market, license, and support enterprise software applications that help organizations transform the way they engage with their customers and process and complete work across their enterprise. We license our no-code Pega Platform™ for rapid application development to clients that wish to build and extend their own business applications. Our cloud-architected portfolio of customer engagement and digital process automation applications leverages artificial intelligence (“AI”), case management, and robotic automation technology, built on our unified no-code Pega Platform, empowering businesses to quickly design, extend, and scale their enterprise applications to meet strategic business needs.

To grow our business, we intend to:

- grow market share by developing and delivering market-leading applications for marketing, sales, service, and operations that can work together seamlessly with maximum differentiation and minimal customization;
- execute new-market growth initiatives, further expanding sales coverage within the Global 3000; and
- continue to scale our digital platform and invest in awareness marketing to support the way today’s clients want to buy products and services.

Whether we are successful depends, in part, on our ability to:

- successfully execute our marketing and sales strategies;
- appropriately manage our expenses as we grow our organization;
- effectively develop new products and enhance our existing products; and
- successfully incorporate acquired technologies into our applications and unified Pega Platform.

Our Products

Pega Infinity™, the latest version of our platform, helps connect enterprises to their customers in real-time across channels, streamline business operations, and adapt to meet changing requirements.

Our applications and platform intersect with and encompass several software markets, including:

- Customer Engagement, including Customer Relationship Management (“CRM”);
- Digital Process Automation (“DPA”), including Business Process Management (“BPM”);

- Robotic Process Automation (“RPA”);
- Business Rules Management Systems (“BRMS”);
- Dynamic Case Management (“DCM”);
- Decision Management, including predictive and adaptive analytics;
- No-code and low-code application development platforms, including Mobile Application Development Platforms (“MADP”); and
- Vertical-Specific Software (“VSS”) market of industry solutions and packaged applications.

Customer engagement

Our omni-channel customer engagement applications are designed to maximize the lifetime value of customers and help reduce the costs of serving customers while ensuring a consistent, unified, and personalized customer experience. At the center of our customer engagement applications is the Pega Customer Decision Hub™, our real-time AI engine, which can predict a customer’s behavior and recommend the “next-best-action” to take across channels in real-time. Pega Marketing™ is designed to enable enterprises to improve customer acquisition and experiences across inbound, outbound, and paid media channels. It incorporates AI in the form of predictive and machine-learning analytics, as well as business rules, and executes these decisions in real-time to evaluate the context of each customer interaction and dynamically deliver the most relevant action, offer, content, and channel.

Pega Sales Automation™ automates and manages the entire sales process, from prospecting to product fulfillment. It allows enterprises to capture best practices, and leverages AI to guide sales teams through the sales and customer onboarding processes.

Pega Customer Service™ is designed to anticipate customer needs, connect customers to the right people and systems, and automate or intelligently guide customer interactions, to rapidly and continuously evolve the customer service experience and to allow enterprises to deliver consistent interactions across channels and improve employee productivity. The application consists of a contact center desktop, case management for customer service, chat, knowledge management, mobile field service, omni-channel self-service, AI-powered virtual assistants, and industry-specific processes and data models.

Digital process automation

We offer industry-specific software applications built on the Pega Platform. These applications provide businesses with robust capabilities to automate industry-specific business processes. As they are built on the Pega Platform, these applications deliver flexibility beyond traditional, “off-the-shelf” products. Our applications allow our clients to offer differentiated service and value to their customers. The Pega Platform empowers organizations to implement new processes quickly, refine customer experiences, bring new offerings to market, and provide customized or specialized automated processing.

Our Capabilities

We drive better business outcomes in two ways:

- Making decisions: delivering real-time customer engagement, powered by real-time, omni-channel AI
- Getting work done: making customer and employee-facing processes more efficient through end-to-end automation and robotics

Real-time, omni-channel AI

AI has been around for many years, in many forms, yet only in the past decade have businesses started using its practical applications, fueled by the new abundance of data to power decisions and ever-increasing customer expectations. Our customer engagement and other applications built on the Pega Platform leverage predictive and adaptive analytics to deliver more personalized customer experiences and maximize business objectives. The Pega Customer Decision Hub, a centralized, always-on “brain”, unleashes the power of predictive analytics, machine learning, and real-time decisioning across our clients’ data, systems, and touchpoints - orchestrating engagement across customer interaction channels.

End-to-end robotic automation

We bring together both human-assisted robotic desktop automation and unattended robotic process automation with our unified DPA and case management capabilities. This gives our platform and applications the ability to automate both customer-facing and back-office operational processes from “end-to-end”, connecting across organizational and

system silos to seamlessly connect customers and employees to successful customer experiences.

Journey-centric rapid delivery

Our customer engagement and DPA solutions are designed to improve targeted customer outcomes, quickly and with out-of-the-box functionality that connects enterprise data and systems to customer experience channels. From there, organizations can scale, one customer experience at a time, to realize greater value while delivering increasingly consistent and personalized customer experiences.

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Software That Writes Your Software®

Our approach bypasses the error-prone and time-consuming process of manually translating requirements into code. Users design software in no-code visual models that reflect the needs of the business. The software application is created and optimized automatically and directly from the model, helping to close the costly gap between vision and execution. Changes to the code are made by altering the model, and application documentation is generated directly from the model. The Pega Platform is standards-based and can leverage a client's existing technology to create new business applications that cross technology silos and bridge the front and back-office.

Unified future-proof platform

We offer a unified DPA platform, combining robotics, process automation, and case management together in a unified architecture. We build in powerful decision analytics, designed to allow our clients to automate any process while working faster and smarter. Our no-code architecture is designed to empower organizations to scale across all dimensions of their business, including product lines, departments, and geographies, by reusing components and avoiding the traditional method of deploying multiple customer engagement and DPA instances that lead to even more silos and disjointed customer experiences.

Cloud choice

Pega Cloud® allows clients to develop, test, and deploy, on an accelerated basis, our applications and the Pega Platform using a secure, flexible internet-based infrastructure, minimizing cost while focusing on core revenue generating competencies.

The Pega Platform and applications are deployable on other cloud architectures, including client or partner-managed clouds. This cloud choice gives our clients the ability to select, and change as needed, the best cloud architecture for the security, data access, speed-to-market, and budget requirements of each application they deploy.

Our Services and Support

We offer services and support through our Global Client Success, Global Service Assurance, Global Client Support, and Pega Academy™ groups. We also use third-party contractors to assist us in providing these services.

Global Client Success

Our Global Client Success group provides guidance to our clients on how to maximize their investment in our technology and realize the business outcomes they are targeting. This includes building implementation expertise and creating awareness of product features and capabilities.

Global Service Assurance

Our Global Service Assurance group addresses risks to client success because of technical concerns. By providing technical staff dedicated to client success, we reduce the time to resolve technical issues, eliminate lengthy deliberations regarding technical resource logistics, and increase clients' confidence in our technology and client service.

Global Client Support

Our Global Client Support group oversees technical support of our products and Pega Cloud. Support services include managing the online support community, proactive problem prevention through information and knowledge sharing, problem tracking, prioritization, escalation, diagnosis, and resolution.

Pega Academy

The success of our sales strategy for repeat sales to target clients depends on our ability to train a large number of partners and clients to implement our technology.

We offer both instructor-led and online training to our employees, clients, and partners. We have also partnered with universities to offer our courseware as part of the student curriculum to expand our ecosystem.

Our Partners

We collaborate with global systems integrators and technology consulting firms that provide consulting services to our clients. Strategic partnerships with these firms are important to our sales efforts, because they influence buying decisions, help us to identify sales opportunities, and complement our software with their domain expertise and services capabilities. These partners may deliver strategic business planning, consulting, project management, and implementation services to our clients.

Currently, our partners include well-respected major firms, such as Accenture PLC, Atos SE, Capgemini SA, Cognizant Technology Solutions Corporation, EY, Infosys Limited, PwC, Tata Consultancy Services Limited, Tech

Mahindra Limited, Virtusa Corporation, and Wipro Limited.

Our Markets

Target Clients

Our target clients are Global 3000 organizations and government agencies that require applications to differentiate themselves in the markets

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they serve. Our applications achieve and facilitate differentiation by increasing business agility, driving growth, improving productivity, attracting and retaining customers, and reducing risk. We deliver applications tailored to our clients' specific industry needs.

Our clients represent many industries, including:

Financial services - Financial services organizations rely on software to market, onboard, cross-sell, retain, and service their customers, as well as automate the operations that support these customer interactions. Our customer service, sales, new account onboarding, Know Your Customer ("KYC"), marketing, collections, and dispute management applications allow clients to be responsive to changing business requirements.

Healthcare - Healthcare organizations seek software that integrates their front and back-offices and helps them deliver personalized care and customer service while reducing costs, automating processes, and increasing operational efficiency. Our applications allow healthcare clients to address the sales, service, operations, financial, administrative, and regulatory requirements of healthcare consumerism and reform.

Manufacturing and high tech - Manufacturers worldwide are transforming their businesses to better engage customers and suppliers, as well as to directly manage product performance throughout the product lifecycle. Our manufacturing applications address customer service and field service, manage warranties, recalls, repairs, returns, improve the performance of direct sales forces, and extend existing enterprise resource planning system capabilities.

Communications and media - Communications and media organizations need to address high levels of customer churn, growing pressure to increase revenue, and an ability to respond quickly to changing market conditions. Our applications enable organizations to reshape the way they engage with customers and increase customer lifetime value throughout the customer lifecycle by delivering omni-channel, personalized customer experiences. Our applications are designed to solve the most critical business issues from acquiring more customers at higher margin, increasing cross-sell/up-sell, improving the efficiency and effectiveness of customer service, and streamlining sales and quoting.

Insurance - Insurance companies, whether competing globally or nationally, need software to automate the key activities of distribution management, quoting, underwriting, claims, and policy servicing. Insurers are also becoming increasingly sensitive to ways to improve customer service and the overall customer experience. Our applications for insurance carriers are designed to help increase business value by delivering customer-focused experiences and personalized interactions that help drive higher sales, lower expense ratios, and mitigate risk.

Government - Government agencies need to modernize legacy systems and processes to meet the growing demands for improved constituent service, lower costs, reduced fraud, and greater levels of transparency. Our applications deliver advanced capabilities to help streamline operations and optimize service delivery through an agile, omni-channel approach.

Consumer services - Organizations that provide services to a range of consumers, in industries such as transportation, utilities, consumer-focused internet companies, retail, hospitality, and entertainment. Our marketing, customer service, and sales applications allow these organizations to personalize their customer engagement to acquire more customers, drive revenue through cross-sell/up-sell, and increase service efficiency while increasing customer satisfaction.

Life sciences - Life sciences organizations are looking for solutions to improve customer engagement, as well as increase efficiencies and transparency across the product development life-cycle. Our customer engagement, clinical, and pharmacovigilance applications are designed to deliver customer engagement, safety and risk management, and regulatory transparency.

Competition

The markets for our offerings are intensely competitive, rapidly changing, and highly fragmented, as current competitors expand their product offerings and new companies enter the market. See "Item 1A. Risk Factors" of this Annual Report for additional information.

We encounter competition from:

• Customer engagement, including CRM application vendors;

• DPA, including BPM vendors, no-code and low-code application development platforms, and service-oriented architecture middleware vendors;

• Case management vendors;

- Decision management, data science and AI vendors, as well as vendors of solutions that leverage decision making and data science in managing customer relationships and marketing;
- Robotic automation and workforce intelligence software providers;
- Companies that provide application-specific software for financial services, healthcare, insurance, and other specific markets;
- Mobile application platform vendors;

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Co-browsing software providers;

Social listening, text analytics, and natural language processing vendors;

Professional service organizations that develop their own products or create custom software in conjunction with rendering consulting services; and

Clients' in-house information technology departments, which may seek to modify their existing systems or develop their own proprietary systems.

Competitors vary in size, scope, and breadth of the products and services they offer and include some of the largest companies in the world, such as Salesforce.com, Microsoft Corporation, Oracle Corporation, SAP SE, and International Business Machines Corporation ("IBM").

We have been most successful competing for clients whose businesses are characterized by a high degree of change, complexity, or regulation. We believe the principal competitive factors within our market include:

product adaptability, scalability, functionality, and performance;

proven success in delivering cost-savings and efficiency improvements;

proven success in enabling improved customer interactions;

ease-of-use for developers, business units, and end-users;

timely development and introduction of new products and product enhancements;

establishment of a significant base of reference clients;

ability to integrate with other products and technologies;

customer service and support;

product price;

vendor reputation; and

relationships with systems integrators.

We believe we are competitively differentiated as our unified Pega Platform is designed to allow client business and IT staff, using a single, intuitive user interface, to build and evolve enterprise applications in a fraction of the time it would take with disjointed architectures and tools offered by our competitors. In addition, our applications, built on the Pega Platform, provide the same level of flexibility and ability to adapt to our clients' needs as our Pega Platform. We believe we compete favorably due to our expertise in our target industries and our long-standing client relationships. We believe we compete less favorably on some of the above factors against our larger competitors, many of which have greater sales, marketing, and financial resources, more extensive geographical presence, and greater name recognition than we do. In addition, we may be at a competitive disadvantage against our larger competitors with respect to our ability to provide expertise outside our target industries.

Intellectual Property

We rely primarily on a combination of copyright, patent, trademark, and trade secrets laws, as well as confidentiality and intellectual property agreements to protect our proprietary rights. We have obtained patents relating to our system architecture and products in strategic global markets. We enter into confidentiality, intellectual property ownership, and license agreements with our employees, partners, clients, and other third parties. We also control access to and ownership of software, services, documentation, and other proprietary information to protect our proprietary rights.

Sales and Marketing

We sell our software and services primarily through a direct sales force. In addition, strategic partnerships with management consulting firms and major systems integrators are important to our sales efforts, because they influence buying decisions, help us identify sales opportunities, and complement our software and services with their domain expertise and consulting capabilities. We also partner with technology providers and application developers.

To support our sales efforts, we conduct a broad range of marketing programs, including awareness advertising, client and industry-targeted solution campaigns, trade shows, including our PegaWorld® user conference, solution seminars and webinars, industry analyst and press relations, web and digital marketing, community development, social media presence, and other direct and indirect marketing efforts. Our consulting employees, business partners, and other third parties also conduct joint and separate marketing campaigns that generate sales leads for us.

Research and Development

Our research and development organization is responsible for product architecture, core technology development, product testing, and quality

assurance. Our product development priority is to continue expanding the capabilities of our technology. We intend to maintain and extend the support of our existing applications, and we may choose to invest in additional strategic applications which incorporate the latest business innovations. We also intend to maintain and extend the support of popular hardware platforms, operating systems, databases, and connectivity options to facilitate easy and rapid deployment in diverse IT infrastructures. Our goal with all products is to enhance product capabilities, ease of implementation, long-term flexibility, and the ability to provide improved client service.

Employees

As of January 31, 2019, we had 4,650 employees worldwide, of which 1,919 were based in North America, 960 were based in Europe, and 1,771 were based in Asia-Pacific.

Backlog

As of December 31, 2018, we expected to recognize \$631 million in revenue in future periods from backlog on existing contracts. We must fulfill certain conditions related to these agreements prior to recognizing revenue, and there can be no assurance when, if ever, we will be able to satisfy all such conditions.

See "Remaining Performance Obligations" in Item 7 of this Annual Report for additional information.

Corporate Information

Pegasystems Inc. was incorporated in Massachusetts in 1983. Our stock is traded on the NASDAQ Global Select Market under the symbol "PEGA". Our website is located at www.pega.com and our investor relations website is located at www.pega.com/about/investors.

Available Information

We make available our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, and Current Reports on Form 8-K, and amendments to these reports, free of charge through our website as soon as reasonably practicable after we electronically file such material with, or furnish such material to, the Securities and Exchange Commission ("SEC"). We also make available on our website reports filed by our executive officers and directors on Forms 3, 4, and 5 regarding their ownership of our securities. Our Code of Conduct, and any amendments to our Code of Conduct, are also available on our website in the "Governance" section.

The SEC maintains a website that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC at www.sec.gov.

ITEM 1A. RISK FACTORS

The risks and uncertainties described below are not the only ones we face. Other events that we do not currently anticipate or that we currently deem immaterial may also affect our results of operations, cash flows, and financial condition.

Risks Related to Our Business and Industry

We may not be able to achieve the key elements of our strategy and grow our business as anticipated.

We currently intend to grow our business by pursuing strategic initiatives. Key elements of our strategy include growing our market share by developing and delivering robust applications that can work together seamlessly with maximum differentiation and minimal customization, offering versatility in our Pega Platform and application deployment and licensing options to meet the specific needs of our clients, growing our network of partner alliances, and developing the talent and organizational structure capable of supporting our revenue and earnings growth targets. We may not be able to achieve one or more of our key initiatives. Our success depends on our ability to appropriately manage our expenses as we grow our organization, successfully execute our marketing and sales strategies, successfully incorporate acquired technologies into our unified Pega Platform and develop new products or product enhancements. If we are not able to execute on these actions, our business may not grow as we anticipated, and our operating results and financial condition could be adversely affected.

We depend on key personnel and must be able to attract and retain qualified personnel in the future.

Our business is dependent on key, highly skilled technical, managerial, consulting, sales, and marketing personnel, including our Chief Executive Officer who is also our founder and majority stockholder. The loss of key personnel could be disruptive to our operations and adversely affect financial performance. We do not have any significant key-person life insurance on any officers or employees and do not plan to obtain any. Our success will depend in large part on the ability to attract and retain qualified personnel, and rapidly replace and develop new management. The number of potential employees who have the extensive knowledge needed to develop, sell, and maintain our offerings

is limited, and competition for their services is intense, and there can be no assurance that we will be able to attract and retain such personnel. If we are unable to do so, our business, operating results, and financial condition could be materially adversely affected.

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The timing of our license and cloud revenue is difficult to predict accurately, which may cause our operating results to vary considerably.

A change in the size or volume of license and cloud arrangements, or a change in the mix between perpetual licenses, term licenses, and cloud arrangements can cause our revenues and cash flows to fluctuate materially between periods. Should a client choose to enter into a cloud arrangement revenue and cash flows are typically recognized and received over the service period of the cloud arrangement. In contrast with a perpetual or term license the revenue is typically recognized upfront when the license rights become effective.

Factors which may influence the predictability of our license and cloud revenue include:

- changes in clients' budgets and decision-making processes that could affect both the timing and size of transactions;
- deferral of license revenue to future periods due to the timing of the execution of an agreement or our ability to deliver the products or services;
- changes in our business model; and/or
- our ability to execute on our marketing and sales strategies.

We budget for our selling and marketing, product development, and other expenses based upon anticipated future bookings and revenue. If the timing or amount of revenue fails to meet our expectations in a given period, our financial performance is likely to be adversely affected because only a small portion of our expenses vary with revenue. Other factors which may cause our operating results to vary considerably include changes in foreign currency exchange rates, income tax effects, and the impact of new accounting pronouncements.

As a result, period-to-period comparisons of our operating results are not necessarily meaningful and should not be relied upon to predict future performance. If our revenues and operating results do not meet the expectations of our investors or securities analysts or fall below guidance we may provide to the market, or due to other factors discussed elsewhere in this section, the price of our common stock may decline.

The number of license and cloud arrangements has been increasing, and we may not be able to sustain this growth unless our partners and we can provide sufficient high-quality consulting, training, and maintenance resources to enable our clients to realize significant business value from our software.

Our clients typically request consulting and training to assist them in implementing our license and cloud offerings. Our clients also typically purchase maintenance on our perpetual and term licenses. As a result, an increase in the number of license and cloud arrangements is likely to increase demand for consulting, training, and maintenance related to our offerings. Given that the number of our license and cloud arrangements has been increasing, we will need to provide our clients with more consulting, training, and maintenance to enable them to realize significant business value from our software. We have been increasing our partner and client enablement through training to create an expanded ecosystem of people that are skilled in the implementation of our products. However, if we and our partners are unable to provide sufficient high-quality consulting, training, or maintenance resources to our clients, our clients may not realize sufficient business value from our offerings to justify follow-on sales, which could impact our future financial performance. In addition, the investments required to meet the increased demand for our consulting services could strain our ability to deliver our consulting engagements at desired levels of profitability, thereby impacting our overall profitability and financial results.

We may not be able to maintain our retention rate for cloud clients.

In recent periods, an increasing percentage of our revenue has been derived from our cloud offerings. Our clients have no obligation to renew their cloud subscriptions, although historically most have elected to do so. If our retention rate for those clients were to decrease, our business, operating results, and financial condition could be materially and adversely affected.

We are investing heavily in sales and marketing, research and development, and support resources in anticipation of continued growth in license and cloud arrangements, and we may experience decreased profitability or losses if we do not continue to increase the value of our license and cloud arrangements to balance our growth in expenses.

We have been expanding our sales and marketing capacity to meet increasing demand for our software and to broaden our market coverage by hiring additional sales and marketing personnel. We anticipate that we will need to provide our clients with more maintenance support because of this increase in demand and have been hiring additional personnel in this area. We continue to invest significantly in research and development to expand and improve the Pega Platform and applications. These investments have resulted in increased fixed costs that do not vary with the

level of revenue. If the increased demand for our offerings does not continue, we could experience decreased profitability or losses because of these increased fixed costs. Conversely, if we are unable to hire sales and marketing personnel to meet future demand or research and development personnel to enhance our current products or develop new products, we may not be able to achieve our sales and profitability targets.

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We face risks from operations and clients based outside of the U.S.

We market our products and services to clients based outside of the U.S., which represent an average of 44% of our total revenue over the last three fiscal years. We have established offices in the Americas, Europe, Asia, and Australia. We believe that growth will necessitate expanded international operations, resulting in increased managerial attention and costs. We anticipate hiring additional personnel to accommodate increased international market demand, and we may also enter into agreements with local distributors, representatives, or resellers. If we are unable to do one or more of these things in a timely and effective manner, the growth, if any, of our international operations may be restricted, and our business, operating results, and financial condition could be materially and adversely affected.

Additional risks inherent in our international business activities generally include:

• laws and business practices favoring local competitors;

• compliance with multiple, conflicting, and changing governmental laws and regulations, including employment, tax, privacy and data privacy and protection, and increased tariffs and other trade barriers;

• the costs of localizing offerings for local markets, including translation into foreign languages and associated expenses;

• longer payment cycles and credit and collectability risk on our foreign trade receivables;

• economic and political uncertainty around the world, such as the U.K.'s referendum in which voters approved an exit from the European Union (EU), commonly referred to as "Brexit";

• difficulties in enforcing contractual and intellectual property rights;

• heightened fraud and bribery risks;

• treatment of revenue from international sources and changes to tax codes, including being subject to foreign tax laws, being liable for paying withholding income or other taxes in foreign jurisdictions, and other potentially adverse tax consequences (including restrictions on repatriating earnings and the threat of "double taxation");

• management of our international operations, including increased accounting, internal control, and compliance expenses;

• heightened risks of political and economic instability; and

• foreign currency exchange rate fluctuations and controls.

There can be no assurance that one or more of these factors will not have a material adverse effect on our international operations, and, consequently, on our business, operating results, and financial condition.

We rely on certain third-party relationships.

We have a number of relationships with third parties that are significant to our sales, marketing, support, and product development efforts, including hosting facilities for our cloud offering. We rely on software and hardware vendors, large system integrators, and technology consulting firms to supply marketing and sales opportunities for our direct sales force and to strengthen our products using industry-standard tools and utilities. We also have relationships with third parties that distribute our products. There can be no assurance that these companies, many of which have far greater financial and marketing resources than we do, will not develop or market offerings that compete with ours in the future or will not otherwise end or limit their relationships with us. Further, the use of third-party hosting facilities requires us to rely on the functionality and availability of the third parties' services, as well as their data security, which despite our due diligence, may be or become inadequate.

We are exposed to fluctuations in currency exchange rates that could negatively impact our financial results and cash flows.

Because a significant portion of our business is conducted outside the U.S., we face exposure to adverse movements in foreign currency exchange rates. Our international sales are usually denominated in foreign currencies. The operating expenses of our foreign operations are also primarily denominated in foreign currencies, which partially offset our foreign currency exposure on our international sales. Our results of operations and cash flows are subject to fluctuations due to changes in foreign currency exchange rates, particularly changes in the U.S. dollar, the Euro, and the Australian dollar relative to the British Pound. These exposures may change over time as business practices evolve.

We have used in the past, but do not currently use foreign currency forward contracts to hedge our exposure to changes in foreign currency exchange rates associated with our foreign currency denominated cash, accounts receivable, and intercompany receivables and payables held by our U.S. parent company and its U.K. subsidiary. We

may enter into hedging contracts again in the future if we believe it is appropriate.

Our realized gain or loss with respect to foreign currency fluctuations will generally depend on the size and type of cross-currency exposures that we enter into, the currency exchange rates associated with these exposures and changes in those rates, whether we have

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entered into forward contracts to offset these exposures, and other factors. All of these factors could materially impact our operating results, financial condition, and cash flows.

Our consulting revenue is significantly dependent upon our consulting personnel implementing new license and cloud arrangements.

We derive a substantial portion of our consulting revenue from implementations of new licenses and cloud arrangements managed by our consulting personnel and consulting for partner and client-led implementation efforts. Our strategy is to support and encourage partner-led and client-led implementations to increase the breadth, capability, and depth of market capacity to deliver implementation services to our clients. Accordingly, if our consulting personnel's involvement in future implementations decreases, this could adversely affect our consulting revenue. We frequently enter into a series of license or cloud arrangements that are each focused on a specific purpose or area of operations. If we are not successful in obtaining follow-on business from these clients, our financial performance could be adversely affected.

Once a client has realized the value of our software, we work with the client to identify opportunities for follow-on sales. However, we may not be successful in demonstrating this value for a number of reasons, including the performance of our products, the quality of the services and support provided by us and our partners, or external factors. Also, some of our smaller clients may have limited additional sales opportunities available. We may not obtain follow-on sales, or the follow-on sales may be delayed, and our future revenue could be limited. This could lower the total value of all transactions and adversely affect our financial performance.

We will need to acquire or develop new products, evolve existing ones, address any defects or errors, and adapt to technology changes.

Technical developments, client requirements, programming languages, and industry standards change frequently in the markets in which we operate. As a result, our success will depend upon our ability to enhance current products, address any product defects or errors, acquire, or develop and introduce new products that meet client needs, keep pace with technology changes, respond to competitive products, and achieve market acceptance. Product development requires substantial investments for research, refinement, and testing. We may not have sufficient resources to make necessary product development investments. We may experience technical or other difficulties that will delay or prevent the successful development, introduction, or implementation of new or enhanced products. We may also experience technical or other difficulties in the integration of acquired technologies into our existing platform and applications. Inability to introduce or implement new or enhanced products in a timely manner could result in loss of market share if competitors are able to provide solutions to meet client needs before we do, give rise to unanticipated expenses related to further development or modification of acquired technologies, and adversely affect future financial performance.

The market for our offerings is intensely and increasingly competitive, rapidly changing, and highly fragmented. We compete in the CRM, including marketing, sales, and customer service, DPA, including BPM, case management, decision management, robotic automation, co-browsing, social engagement, and mobile application development platform software markets, as well as in markets for the vertical applications we provide (e.g. Pega KYC™ for Financial Services, Pega Underwriting™ for Insurance). These markets are intensely competitive, rapidly changing, and highly fragmented, as current competitors expand their product offerings and new companies enter the market.

We encounter significant competition from other technology vendors, as well as clients' internal information systems departments, that seek to modify their existing systems or develop their own proprietary systems, and professional service organizations that develop their own products or create custom software in conjunction with rendering consulting services. Competition for market share and pressure to reduce prices and make sales concessions are likely to increase. Many of our competitors, such as IBM, Oracle Corporation, Microsoft Corporation, SAP SE, and Salesforce.com, have far greater resources than we do and may be able to respond more quickly and efficiently to new or emerging technologies, programming languages, or standards, or to changes in client requirements or preferences. Competitors may also be able to devote greater managerial and financial resources to develop, promote, and distribute products and to provide related consulting and training services. There can be no assurance that we will be able to compete successfully against current or future competitors or that the competitive pressures faced by us will not materially adversely affect our business, operating results, and financial condition. See "Competition" in Item 1 of this Annual Report for additional information.

The continued uncertainties in the global economy may negatively impact our sales to, and the collection of receivables from, our clients.

Our sales to, and our collection of receivables from, our clients may be impacted by adverse changes in global economic conditions. The U.S. and other key international economies have experienced cyclical downturns from time to time, during which economic activity has been impacted by falling demand for goods and services, restricted credit, poor liquidity, reduced corporate profitability, volatility in credit, equity, and foreign exchange markets, bankruptcies, and economic uncertainty. These changes in global economic conditions could impact the ability and willingness of our clients to make investments in technology, which in turn may delay or

reduce the purchases of our software and services. These factors could also impact the ability and willingness of these clients to pay their trade obligations and honor their contractual commitments. These clients may also become subject to increasingly restrictive regulatory requirements, which could limit or delay their ability to proceed with technology purchases and may result in longer sales cycles, increased price competition, and reductions in sales of our products and services. The financial uncertainties facing many of our clients and the industries in which they operate could negatively impact our business, operating results, and financial condition.

We have historically sold to the financial services, healthcare, insurance, and communications markets, and rapid changes or consolidation in these markets could affect the level of demand for our products.

We have historically derived a significant portion of our revenue from clients in the financial services, healthcare, insurance, and communications markets, and sales to these markets are important for our future growth. Competitive pressures, industry consolidation, decreasing operating margins, regulatory changes, and privacy concerns affect the financial condition of our clients and their willingness to buy. In addition, clients' purchasing patterns in these industries for large technology projects are somewhat discretionary. The financial services and insurance markets continue to undergo intense domestic and international consolidation, and consolidation has increased in the healthcare and communications markets. Consolidation may interrupt normal buying behaviors and increase the volatility of our operating results. In recent years, several of our clients have merged or consolidated, and we expect this to continue in the future. Future mergers or consolidations may cause a decline in revenues and adversely affect our future financial performance. All of these factors affect the level of demand for our products from clients in these industries, and could adversely affect our business, operating results, and financial condition.

Risks Related to Information Technology Resilience and Security

We face risks related to outages, data losses, and disruptions of our online services if we fail to maintain an adequate operations infrastructure.

The increasing user traffic for our cloud offering demands more computing power. It requires that we maintain an internet connectivity infrastructure that is robust and reliable within competitive and regulatory constraints that continue to evolve. Inefficiencies or operational failures, including temporary or permanent loss of client data, power outages, or telecommunications infrastructure outages, by us or our third-party service providers could diminish the quality of our user experience resulting in contractual liability, claims by clients and other third parties, damage to our reputation, loss of current and potential clients, and harm to our operating results and financial condition.

Security of our systems and of global client data is a growing challenge on many fronts. Cyber-attacks and security breaches may expose us to significant legal and financial liabilities.

Our cloud offering provides Pega Platform environments that are provisioned, monitored, and maintained for individual clients to create and deploy Pega-based applications using an Internet-based infrastructure. These services involve the storage and transmission of clients' data and other confidential information. Security breaches could expose us and our clients to a risk of loss or misuse of this information. Any security breach could result in a loss of confidence in the security of our services, damage our reputation, disrupt our business, lead to legal liability, and negatively impact our future sales. High-profile security breaches at other companies have increased in recent years, and security industry experts and government officials have warned about the risks of hackers and cyber-attackers targeting information technology products and businesses. Threats to IT security can take a variety of forms.

Individual hackers, groups of hackers, and sophisticated organizations including state-sponsored organizations or nation-states themselves, may take steps that pose threats to our clients and to our IT structure.

Our security measures, and those of our clients, may be breached because of third-party actions, or that of employees, consultants, or others, including intentional misconduct by computer hackers, system error, human error, technical flaws in our products, or otherwise. The techniques used to obtain unauthorized access or to sabotage systems change frequently and generally are not recognized until launched against a target. While we have invested in the protection of our data and systems and of our clients' data to reduce these risks, there can be no assurance that our efforts will prevent breaches. We carry data breach insurance coverage to mitigate the financial impact of a breach, though this may prove insufficient in the event of a breach.

Our cloud offering involves the hosting of clients' applications on the servers of third-party technology providers. We also rely on third-party systems and technology, including encryption, virtualized infrastructure and support, and we employ a shared security model with our clients and our third-party technology providers. Because we do not control

the configuration of Pega applications by our clients, the transmissions between our clients and our third-party technology providers, the processing of data on the servers at third-party technology providers, or the internal controls maintained by our clients and third-party technology providers that could prevent unauthorized access or provide appropriate data encryption, we cannot fully ensure the complete integrity or security of such transmissions processing or controls. In addition, privacy, security, and data transmission concerns in some parts of the world may inhibit demand for our cloud offering or lead to requirements to provide our products or services in configurations that may increase the cost of serving such markets.

To defend against security threats, we need to continuously engineer products and services with enhanced security and reliability features, improve the deployment of software updates to address security vulnerabilities, apply technologies that mitigate the risk of

attacks, and maintain a digital security infrastructure that protects the integrity of our network, products, and services. The cost of these steps could negatively impact our operating results.

We may experience significant errors or security flaws in our products and services, and could face privacy, product liability, and warranty claims as a result.

Despite quality testing prior to its release, our software frequently contains errors or security flaws, especially when first introduced or when new versions are released. Errors in our software could affect its ability to work with hardware or other software or could delay the development or release of new products or new versions of our software. Additionally, the detection and correction of any security flaws can be time consuming and costly. Errors or security flaws in our software could result in the inadvertent disclosure of confidential information or personal data relating to our clients, employees, or third parties. Software errors and security flaws in our products or services could expose us to privacy, product liability, and/or warranty claims as well as harm our reputation, which could impact our future sales of products and services. Typically, we enter into license agreements that contain provisions intended to limit the nature and extent of our risk of product liability and warranty claims. There is a risk that a court might interpret these terms in a limited way or could hold part or all of these terms to be unenforceable. Also, there is a risk that these contract terms might not bind a party other than the direct client. Furthermore, some of our licenses with our clients are governed by non-U.S. law, and there is a risk that foreign law might give us less or different protection. Although we have not experienced any material product liability claims to date, a product liability suit or action claiming a breach of warranty, whether meritorious, could result in substantial costs and a diversion of management's attention and our resources.

Risks Related to Government Regulation and Intellectual Property

The formal notification by the U.K. of its intention to withdraw from the EU (commonly referred to as "Brexit") could have a material impact on our business, including our relationships with existing and future clients, suppliers, and employees, which could have an adverse effect on our financial results and operations.

Pursuant to the U.K.'s referendum in June 2016, in which a majority voted in favor of the U.K.'s exit from the EU, the British government is negotiating the future terms of the U.K.'s relationship with the EU. The final terms of the U.K.'s relationship with the EU after exit are not currently known. We have material operations in the U.K. and larger EU. The ultimate effects, or perceived effects, of the U.K.'s decision could potentially disrupt the markets we serve and the tax jurisdictions in which we operate. In addition, Brexit could lead to legal uncertainty as the U.K. determines which EU laws to replace or replicate.

We are subject to increasingly complex U.S. and foreign laws and regulations, requiring costly compliance measures, and any failure to comply with these laws and regulations could subject us to, among other things, penalties and legal expenses that could harm our reputation or have a material adverse effect on our business, financial condition, and results of operations.

We are subject to extensive federal, state, and foreign laws and regulations, including but not limited to the U.S. Foreign Corrupt Practices Act, the U.K. Bribery Act, data privacy and security laws, and similar laws and regulations. The Foreign Corrupt Practices Act, the U.K. Bribery Act, and similar foreign anti-bribery laws generally prohibit companies and their intermediaries from making improper payments for the purpose of obtaining or retaining business. Similar laws and regulations exist in many other countries throughout the world in which we do or intend to do business. Data privacy laws and regulations in Europe, Australia, Latin America and elsewhere are undergoing rapid transformation toward increased restrictions.

In April 2016, the European Parliament adopted the General Data Protection Regulation ("GDPR"). It became effective in May 2018. The GDPR extends the scope of European privacy laws to any entity which controls or processes personal data of EU residents in connection with the offer of goods or services or the monitoring of behavior and imposes new compliance obligations concerning the handling of personal data. Complying with the GDPR and other emerging and changing requirements caused us to incur additional costs in fiscal year 2018 and may cause us to incur substantial additional costs or require us to change our business practices. Compliance also depends on how regulators choose to interpret and apply the new requirements. Moreover, non-compliance, or if regulators assert we have not complied, with GDPR could result in significant monetary penalties of up to the higher of 20 million Euro or 4% of annual worldwide revenue, private lawsuits, and damage to our reputation, which could have a material adverse effect on our business, operating results, and financial condition.

We have developed and implemented a compliance program based on what we believe are current best practices, including the background checking of our current partners and prospective clients and partners. We cannot guarantee, however, that we, our employees, our consultants, our partners, or our contractors are or will be compliant with all federal, state, and foreign regulations, particularly as we expand our operations outside of the U.S. If we or our representatives fail to comply with any of these laws or regulations, a range of fines, penalties, and/or other sanctions could be imposed on us, which could have a material adverse effect on our business, financial condition, and results of operations. Even if we are determined not to have violated these laws, government inquiries into these issues typically require the expenditure of significant resources and generate negative publicity, which could also have an adverse effect on our business. In addition, regulation of data privacy and security laws is increasing worldwide, including various restrictions on cross-border access or transfer of data, including personal data of our employees, our clients, and customers of

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our clients. Compliance with such regulations may increase our costs and there is a risk of enforcement of such laws resulting in damage to our brand, as well as, financial penalties and potential loss of business, which could be significant.

We may have exposure to greater than anticipated tax liabilities.

The determination of our worldwide provision for income taxes and other tax liabilities requires estimation and significant judgment, and there are many transactions and calculations where the ultimate tax determination is uncertain. Like many other multinational corporations, we are subject to tax in multiple U.S. and foreign jurisdictions. Our determination of our tax liability is always subject to audit and review by applicable domestic and foreign tax authorities, and we are currently undergoing a number of inquiries, audits, and reviews by taxing authorities throughout the world. Any adverse outcome of any such audit or review could harm our business, and the ultimate tax outcome may differ from the amounts recorded in our financial statements and may materially affect our financial results in the period or periods for which such determination is made. While we have established reserves based on assumptions and estimates that we believe are reasonable to cover such eventualities, these reserves may prove to be insufficient.

In addition, our future income taxes could be adversely affected by a shift in our jurisdictional earning mix, by changes in the valuation of our deferred tax assets and liabilities, as a result of changes in tax laws, regulations, or accounting principles, as well as by certain discrete items.

In light of continuing fiscal challenges in many jurisdictions, various levels of government are increasingly focused on tax reform and other legislative action to increase tax revenue, including corporate income taxes. A number of U.S. states have attempted to increase corporate tax revenues by taking an expansive view of corporate presence to attempt to impose corporate income taxes and other direct business taxes on companies that have no physical presence in their state, and taxing authorities in foreign jurisdictions may take similar actions. Many U.S. states are also altering their apportionment formulas to increase the amount of taxable income or loss attributable to their state from certain out-of-state businesses. Similarly, in Europe, and elsewhere in the world, there are various tax reform efforts underway designed to ensure that corporate entities are taxed on a larger percentage of their earnings.

If it becomes necessary to repatriate any of our foreign cash balances to the United States, we may be subject to increased income taxes, other restrictions, and limitations.

As of December 31, 2018, approximately \$63.9 million of our cash and cash equivalents was held in our foreign subsidiaries. If we are unable to reinvest this cash outside of the U.S., we may have to repatriate some of our foreign cash to the U.S. which would increase our income tax liability. If it becomes necessary to repatriate these funds, we may be required to pay U.S. state and local taxes, as well as foreign taxes, upon repatriation. We consider the earnings of our foreign subsidiaries to be permanently reinvested and, as a result, U.S. state, U.S. local, and foreign taxes on such earnings have not been provided. It is impractical to estimate the amount of U.S. state, U.S. local, and foreign tax we would have to pay upon repatriation due to the complexity of the income tax laws and the effects of the Tax Reform Act and other factors.

We face risks related to intellectual property claims or appropriation of our intellectual property rights.

We rely primarily on a combination of copyright, trademark, and trade secrets laws, as well as intellectual property and confidentiality agreements to protect our proprietary rights. We also try to control access to and distribution of our technologies and other proprietary information. We have obtained patents in strategically important global markets relating to the architecture of our systems. We cannot assure that such patents will not be challenged, invalidated, or circumvented or that rights granted thereunder, or the claims contained therein will provide us with competitive advantages. Moreover, despite our efforts to protect our proprietary rights, unauthorized parties may attempt to copy aspects of our software or to obtain the use of information that we regard as proprietary. Although we generally enter into intellectual property and confidentiality agreements with our employees and strategic partners, despite our efforts our former employees may seek employment with our business partners, clients, or competitors, and there can be no assurance that the confidential nature of our proprietary information will be maintained. In addition, the laws of some foreign countries do not protect our proprietary rights as effectively as they do in the U.S. There can be no assurance that our means of protecting our proprietary rights will be adequate or that our competitors will not independently develop similar technology.

Other companies or individuals have obtained proprietary rights covering a variety of designs, processes, and systems. There can be no assurance that third parties, including clients, will not claim infringement by us with respect to current or future products. Although we attempt to limit the amount and type of our contractual liability for infringement of the proprietary rights of third parties and assert ownership of work product and intellectual property rights as appropriate, there are often exceptions, and limitations may not be applicable and enforceable in all cases. Even if limitations are found to be applicable and enforceable, our liability to our clients for these types of claims could be material given the size of certain of our transactions. We expect that software product developers will increasingly be subject to infringement claims as the number of products and competitors in our industry segment grows and the functionality of products in different industry segments overlaps. Any such claims, with or without merit, could be time-consuming, result in costly litigation, cause product shipment and delivery delays, require us to enter into royalty or licensing agreements, or be precluded from making and selling the infringing software, if such proprietary rights are found to be valid. Royalty or licensing agreements, if required, may not be available on terms acceptable to us or at all, which could have a material adverse effect upon our business, operating results, and financial condition.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

Our principal administrative, sales, marketing, support, and research and development operations are in Cambridge, Massachusetts and Hyderabad, India. We also maintain offices elsewhere in the Americas, Europe, and the Asia-Pacific. All our properties are currently leased. We expect to expand our facilities' capacities as our employee base grows. We believe we will be able to obtain such space on acceptable and commercially reasonable terms. See "19. Commitments And Contingencies" in Item 8 of this Annual Report for additional information.

ITEM 3. LEGAL PROCEEDINGS

None.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

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PART II

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

Market information

Our common stock is quoted on the NASDAQ Global Select Market under the symbol "PEGA".

Holders

As of February 14, 2019, we had approximately 24 stockholders of record and approximately 21,400 beneficial owners of our common stock.

Dividends

During 2018, 2017, and 2016, we paid quarterly cash dividends of \$0.03 per share of common stock. It is our current intention to pay a quarterly cash dividend of \$0.03 per share, however, the Board of Directors may terminate or modify this dividend program at any time without prior notice.

Issuer purchases of equity securities

The following table sets forth information regarding repurchases of our common stock during the three months ended December 31, 2018:

(in thousands, except per share amounts)	Total Number of Shares Purchased ⁽¹⁾ ₍₂₎	Average Price Paid per Share ⁽¹⁾ ⁽²⁾	Total Number of Shares Purchased as Part of Publicly Announced Share Repurchase Program ⁽²⁾	Approximate Dollar Value of Shares That May Yet Be Purchased at Period End Under Publicly Announced Share Repurchased Programs ⁽²⁾
October 1, 2018 - October 31, 2018	146	\$ 55.28	139	\$ 24,077
November 1, 2018 - November 30, 2018	170	\$ 52.78	144	\$ 16,489
December 1, 2018 - December 31, 2018	272	\$ 49.31	204	\$ 6,620
Total	588	\$ 51.79		

⁽¹⁾ We net settle most of our employee stock option exercises and restricted stock unit ("RSU") vestings, which results in the withholding of shares to cover the option exercise price and the minimum statutory withholding tax obligations that we are required to pay in cash to the applicable taxing authorities on behalf of our employees. Shares withheld to cover the option exercise price and statutory tax withholding obligations under the net settlement provisions of the Company's stock compensation awards have been included in the above table. See "Common Stock Repurchases" in Item 7 of this Annual Report for additional information.

⁽²⁾ See "Stock Repurchase Program" in Item 7 of this Annual Report for additional information.

Stock Performance Graph and Cumulative Total Stockholder Return ⁽¹⁾

The following performance graph represents a comparison of the cumulative total stockholder return, assuming the reinvestment of dividends, for a \$100 investment on December 31, 2013 in our common stock, the Total Return Index for the NASDAQ Composite, a broad market index, and the Standard & Poor's ("S&P") North American Technology Sector - Software IndexTM ("S&P NA Tech Software"), a published industry index.

	December 31,					
	2013	2014	2015	2016	2017	2018
Pegasystems Inc.	\$100.00	\$84.90	\$112.97	\$148.51	\$194.97	\$198.20
NASDAQ Composite	\$100.00	\$114.75	\$122.74	\$133.62	\$173.22	\$168.30
S&P NA Tech Software	\$100.00	\$113.88	\$128.11	\$136.06	\$194.29	\$218.85

⁽¹⁾ The lines of the graph merely connect measurement dates and do not reflect fluctuations between those dates.

⁽²⁾ We paid total dividends of \$0.12 per share during 2018, 2017, 2016, and 2015 and \$0.09 per share in 2014. The dividends paid per share have been adjusted for the two-for-one common stock split effected in the form of a common stock dividend on April 1, 2014.

ITEM 6. SELECTED FINANCIAL DATA

The selected financial data presented below has been derived from our audited consolidated financial statements. This data should be read in conjunction with “Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations” and “Item 8. Financial Statements and Supplementary Data” of this Annual Report.

(in thousands, except per share amounts) 2018 2017 2016 2015 2014

Consolidated Statements of Operations Data ^{(1) (2)}:

Revenue:

Perpetual license	\$109,863	\$132,883	\$145,053	\$166,305	\$136,154
Term license	178,256	206,411	152,231	109,283	96,182
Maintenance	263,875	242,320	218,635	202,802	186,239
Cloud	82,627	51,097	40,647	30,626	16,614
Consulting	256,960	255,756	205,663	173,679	154,815
Total revenue	\$891,581	\$888,467	\$762,229	\$682,695	\$590,004
(Loss) income from operations	\$(17,032)	\$93,177	\$50,644	\$64,661	\$51,539
Net income	\$10,617	\$98,548	\$45,015	\$36,322	\$33,255
Earnings per share:					
Basic	\$0.14	\$1.27	\$0.59	\$0.47	\$0.44
Diluted	\$0.13	\$1.19	\$0.56	\$0.46	\$0.42

Cash dividends declared per common share 2018 2017 2016 2015 2014

(in thousands) December 31,
2018 2017 2016 2015 2014

Consolidated Balance Sheet Data ^{(2) (3)}:

Total cash, cash equivalents, and marketable securities	\$207,423	\$223,748	\$133,761	\$219,078	\$211,216
Goodwill	\$72,858	\$72,952	\$73,164	\$46,776	\$46,860
Total assets	\$982,553	\$1,012,753	\$867,135	\$627,758	\$587,801
Total stockholders’ equity	\$621,531	\$655,870	\$548,940	\$322,859	\$294,705

⁽¹⁾ We elected to early adopt Accounting Standards Update (“ASU”) 2016-09 “Compensation - Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting” (“ASU 2016-09”) in 2016, which requires us, among other things, to prospectively record excess tax benefits as a reduction of the provision for income taxes in the consolidated statement of operations, whereas they were previously recognized in equity.

⁽²⁾ We retrospectively adopted ASU No. 2014-09, “Revenue from Contracts with Customers (Topic 606)” in 2018. As a result, we have adjusted balances for 2017 and 2016. We have not adjusted 2014 and 2015 for ASU 2014-09. See “2. Significant Accounting Policies” in Item 8 of this Annual Report for additional information.

⁽³⁾ We retrospectively adopted ASU 2015-17 “Income Taxes (Topic 740): Balance Sheet Classification of Deferred Taxes” in 2016. As a result, all net deferred income taxes assets are classified as long-term deferred income tax assets in the consolidated balance sheets for all periods presented. The amounts reclassified as of December 31, 2015 and 2014, were \$12.4 million and \$13 million, respectively.

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

BUSINESS OVERVIEW

We develop, market, license, and support enterprise software applications that help organizations transform the way they engage with their customers and process and complete work across their enterprise. We license our no-code Pega Platform™ for rapid application development to clients that wish to build and extend their own business applications. Our cloud-architected portfolio of customer engagement and digital process automation applications leverages artificial intelligence (“AI”), case management, and robotic automation technology, built on our unified no-code Pega Platform, empowering businesses to quickly design, extend, and scale their enterprise applications to meet strategic business needs.

Our target clients are Global 3000 organizations and government agencies that require applications to differentiate themselves in the markets they serve. Our applications achieve and facilitate differentiation by increasing business agility, driving growth, improving productivity, attracting and retaining customers, and reducing risk. We deliver applications tailored to our clients’ specific industry needs.

Performance metrics

(Dollars in thousands, except per share amounts)	2018	2017	2016	Change	
				2018 vs. 2017	2017 vs. 2016
Total revenue	\$891,581	\$888,467	\$762,229	— %	17 %
Subscription ⁽¹⁾	\$524,758	\$499,828	\$411,513	5 %	21 %
Net income	\$10,617	\$98,548	\$45,015	(89)%	119%
Earnings per share, diluted	\$0.13	\$1.19	\$0.56	(89)%	113%

⁽¹⁾ Subscription revenue reflects client arrangements (term license, cloud, and maintenance) which are subject to renewal.

Annual Contract Value (“ACV”)

The change in ACV measures the growth and predictability of future cash flows from committed term, cloud, and maintenance arrangements as of the end of the particular reporting period.

(Dollars in thousands)	December 31,		Change	
	2018	2017		
Term and cloud ACV	\$300,322	\$215,122	\$85,200	40%
Maintenance ACV	269,708	249,484	20,224	8 %
Total ACV	\$570,030	\$464,606	\$105,424	23%

⁽¹⁾ ACV, as of a given date, is the sum of the following two components:

the sum of the annual value of each term and cloud contract in effect on such date, with the annual value of a term or cloud contract being equal to the total value of the contract divided by the total number of years of the contract; and maintenance revenue reported for the quarter ended on such date, multiplied by four.

Remaining performance obligations

Revenue for the remaining performance obligations on existing contracts is expected to be recognized as follows:

(Dollars in thousands)	December 31, 2018						
	Perpetual license	Term license	Maintenance	Cloud	Consulting	Total	
1 year or less	\$14,665	\$72,378	\$192,274	\$103,354	\$17,235	\$399,906	63 %
1-2 years	2,343	10,355	10,436	80,214	2,810	106,158	17 %
2-3 years	1,661	1,414	3,644	61,906	940	69,565	11 %
Greater than 3 years	—	233	1,560	53,343	208	55,344	9 %
	\$18,669	\$84,380	\$207,914	\$298,817	\$21,193	\$630,973	100 %

RESULTS OF OPERATIONS

(Dollars in thousands)	2018	2017	2016	Change	
				2018 vs. 2017	2017 vs. 2016
Total revenue	\$891,581	\$888,467	\$762,229	— %	17 %
Gross profit	\$589,816	\$608,794	\$522,973	(3) %	16 %
(Loss) income from operations	\$(17,032)	\$93,177	\$50,644	*	84 %
Net income	\$10,617	\$98,548	\$45,015	(89) %	119 %

* not meaningful

Revenue

(Dollars in thousands)	2018	2017	2016	Change	
				2018 vs. 2017	2017 vs. 2016
Term license	\$178,256	\$206,411	\$152,231	(14) %	36 %
Cloud	82,627	51,097	40,647	62 %	26 %
Maintenance	263,875	242,320	218,635	9 %	11 %
Subscription ⁽¹⁾	524,758	499,828	411,513	5 %	21 %
Perpetual license	109,863	132,883	145,053	(17) %	(8) %
Consulting	256,960	255,756	205,663	— %	24 %
Total revenue	\$891,581	\$888,467	\$762,229	— %	17 %

⁽¹⁾ Subscription revenue reflects client arrangements (term license, cloud, and maintenance) which are subject to renewal.

We expect our revenue mix to continue to shift in favor of our cloud offerings, which could result in slower total revenue growth in the near term. Revenue from cloud arrangements is generally recognized over the service period, while revenue from license arrangements is generally recognized upfront when the license rights become effective.

Subscription revenue

The decrease in term license revenue in 2018, and increase in 2017, was primarily due to \$35.3 million of revenue recognized in the three months ended March 31, 2017 from a large term license renewal. The increases in cloud revenue in 2018 and 2017 reflect the shift in client preferences to cloud arrangements from other types of arrangements. The increases in maintenance revenue in 2018 and 2017 were primarily due to the continued growth in the installed base of our software and strong renewal rates in excess of 90%.

Perpetual license

The decreases in perpetual license revenue in 2018 and 2017 reflect the shift in client preferences in favor of our cloud offerings and away from perpetual license arrangements.

Consulting

Consulting revenue is primarily related to new license implementations. See "Our consulting revenue is significantly dependent upon our consulting personnel implementing new license and cloud arrangements" in Item 1A of this Annual Report for additional information.

Consulting revenue was substantially consistent in 2018 with 2017 as a decrease in billable hours in 2018 from a large project which began in the second half of 2016 was offset by an increase in revenue from a large number of other projects. The increase in consulting revenue in the 2017 was primarily due to an increase in billable hours driven by the same large project which began in the second half of 2016.

Gross profit

(Dollars in thousands)				Change				
	2018	2017	2016	2018	2017			
				vs.	vs.			
				2017	2016			
Software license	\$282,950	98%	\$334,209	99%	\$292,341	98%	(15)%	14%
Maintenance	239,310	91%	214,415	88%	193,130	88%	12%	11%
Cloud	45,218	55%	27,326	53%	18,340	45%	65%	49%
Consulting	22,338	9%	32,844	13%	19,162	9%	(32)%	71%
Total gross profit	\$589,816	66%	\$608,794	69%	\$522,973	69%	(3)%	16%

The recent shift in our revenue mix toward cloud arrangements may result in slower total gross profit growth in the near term as our cloud business continues to grow and scale. Revenue from cloud arrangements is generally recognized over the service period, while revenue from license arrangements is generally recognized upfront when the license rights become effective.

2018 Compared to 2017

The decrease in total gross profit was primarily due to \$35.3 million of revenue recognized in the three months ended March 31, 2017 from a large term license renewal and the decrease in perpetual license revenue reflecting the shift in client preferences toward our cloud offerings, partially offset by increases in maintenance and cloud revenue.

The decrease in total gross profit percent was driven by a shift in favor of cloud arrangements, which are lower margin than our license revenue streams. The increase in cloud gross profit percent was driven by cost efficiency gains as our cloud business continues to grow and scale, partially offset by a \$1.8 million increase in client support expenses as we transferred support resources on January 1, 2018 to sustain our growing cloud business.

If we had transferred these resources on January 1, 2017, cloud gross profit and gross profit percent would have been:

	2018	2017
Cloud	\$45,218	\$25,221
	55%	49%

Consulting gross profit percent decreased due to an increase in consulting resource availability in Europe as we grow and leverage our partner network.

2017 Compared to 2016

The increase in total gross profit in 2017 was primarily due to \$35.3 million of revenue recognized in the three months ended March 31, 2017 from a large term license renewal and increases in maintenance, cloud, and consulting revenue.

Operating expenses

Selling and marketing

(Dollars in thousands)				Change	
	2018	2017	2016	2018	2017
				vs.	vs.
				2017	2016
Selling and marketing	\$373,495	\$300,578	\$277,927	24%	8%
As a percent of total revenue	42%	34%	36%		
Selling and marketing headcount, end of period	1,224	984	898	24%	10%

Selling and marketing expenses include compensation, benefits, and other headcount-related expenses associated with our selling and marketing personnel as well as advertising, promotions, trade shows, seminars, and other programs.

Selling and marketing expenses also include the amortization of client-related intangibles.

The increases in headcount reflect our efforts to increase our sales capacity to deepen relationships at existing accounts and industries.

2018 Compared to 2017

The increase was primarily due to a \$56.6 million increase in compensation and benefits associated with higher headcount and increased equity compensation primarily from the increased value of our annual periodic equity awards, a \$5.8 million increase in travel and entertainment driven by our increased sales headcount, and a \$2.7 million increase in marketing programs.

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2017 Compared to 2016

The increase was primarily due to a \$10.8 million increase in compensation and benefits expenses associated with higher headcount and increased equity compensation primarily from the increased value of our annual periodic equity awards, a \$2.4 million increase in travel and entertainment driven by our increased sales headcount, a \$2 million increase in partner and marketing contractor compensation, and a \$1.5 million increase in sales and marketing programs expenses primarily related to our annual PegaWorld user conference.

Research and development

(Dollars in thousands)	2018	2017	2016	Change	
				2018 vs. 2017	2017 vs. 2016
Research and development	\$181,710	\$162,886	\$145,548	12%	12%
As a percent of total revenue	20	% 18	% 19	%	
Research and development headcount, end of period	1,621	1,479	1,431	10%	3%

Research and development expenses include compensation, benefits, contracted services, and other headcount-related expenses associated with the creation and development of our products as well as enhancements and engineering changes to existing products and integration of acquired technologies.

2018 Compared to 2017

The increase was primarily due to a \$12.4 million increase in compensation and benefits and an increase of \$3.7 million in cloud hosting expense. The increase in compensation and benefits was attributable to increased headcount and the expansion of our application development team to support the continued development of our growing suite of software and increased incentive compensation. The increase in cloud hosting expenses was primarily due to additional cloud-focused research and development activities.

2017 Compared to 2016

The increase was primarily due to a \$16.5 million increase in compensation and benefit expenses associated with higher headcount, higher stock-based compensation expense primarily from the increased value of our annual periodic equity awards, and annual merit salary increases.

General and administrative

(Dollars in thousands)	2018	2017	2016	Change	
				2018 vs. 2017	2017 vs. 2016
General and administrative	\$51,643	\$52,153	\$45,951	(1)%	13%
As a percent of total revenue	6	% 6	% 6	%	
General and administrative headcount, end of period	348	425	378	(18)%	12%

General and administrative expenses include compensation, benefits, and other headcount-related expenses associated with finance, legal, corporate governance, and other administrative headcount. They also include accounting, legal, and other professional services fees, and administrative fees. The general and administrative headcount includes some employees in human resources, information technology, and corporate services departments whose costs are partially allocated to our other functional departments.

2018 Compared to 2017

The decrease was primarily due to a decrease of \$3.5 million in compensation and benefits, due to decreased headcount reflecting the realignment of contract negotiation and product development resources to augment our selling and marketing and research and development functions, partially offset by an increase of \$2.3 million in legal and tax services.

2017 Compared to 2016

The increase was primarily due to a \$5.1 million increase in compensation and benefits due to higher stock-based compensation expense primarily from the increased value of our annual periodic equity awards and increased facilities expenses due to our expansion in Poland and India.

Stock-based compensation

We recognize stock-based compensation expense associated with equity awards in our consolidated statements of operations based on the fair value of these awards at the date of grant using the accelerated recognition method, while treating each vesting tranche as if it were an individual grant.

(Dollars in thousands)	2018	2017	2016	Change	
				2018 vs. 2017	2017 vs. 2016
Cost of revenues	\$ 16,862	\$ 14,573	\$ 11,459	16 %	27 %
Selling and marketing	23,237	15,720	12,464	48 %	26 %
Research and development	15,274	13,618	10,043	12 %	36 %
General and administrative	8,489	9,402	6,513	(10)%	44 %
Acquisition-related	—	—	342	*	(100)%
	\$ 63,862	\$ 53,313	\$ 40,821	20 %	31 %
Income tax benefit	\$(13,383)	\$(12,113)	\$(12,198)	10 %	(1)%

* not meaningful

The increases were primarily due to the increased value of our annual periodic equity awards granted in March 2018 and 2017. These awards generally have a five-year vesting schedule.

See "13. Stock-Based Compensation" in Item 8 of this Annual Report for additional information.

Amortization of intangibles

(Dollars in thousands)	2018	2017	2016	Change	
				2018 vs. 2017	2017 vs. 2016
Cost of revenue	\$ 5,027	\$ 5,103	\$ 5,986	(1)%	(15)%
Selling and marketing	6,416	7,235	7,145	(11)%	1 %
General and administrative	—	—	277	*	(100)%
	\$ 11,443	\$ 12,338	\$ 13,408	(7)%	(8)%

* not meaningful

The decreases were primarily due to the full amortization of certain intangibles acquired through past acquisitions.

See "7. Goodwill And Other Intangible Assets" in Item 8 of this Annual Report for additional information.

Non-operating income and expenses, net

(Dollars in thousands)	2018	2017	2016	Change	
				2018 vs. 2017	2017 vs. 2016
Foreign currency transaction gain (loss)	\$ 2,421	\$(6,413)	\$ 9,360	*	*
Interest income, net	2,705	862	911	214%	(5)%
Other income (expense), net	363	(1,391)	(5,580)	*	(75)%
	\$ 5,489	\$(6,942)	\$ 4,691	*	*

* not meaningful

The change in foreign currency transaction gain (loss) was primarily due to unrealized gains on foreign currency denominated cash and receivables.

The change in interest income, net was primarily due to an increase in prevailing interest rates and an increase in our marketable securities holdings.

In May 2017, we discontinued our use of forward contracts; however, we continue to monitor our foreign exchange exposures and may re-initiate our use of forward contracts in the future. We historically used foreign currency forward contracts to hedge our exposure to fluctuations in foreign currency exchange rates associated with our foreign currency denominated cash, accounts receivable, and intercompany receivables and payables held primarily by our U.S. parent company and its U.K. subsidiary. The total change in the fair value of our foreign currency forward

contracts recorded in other income (expense), net, during 2017 and 2016 was a gain of \$0.3 million and a loss of \$5.6 million, respectively. The gain on forward contracts in 2017 was offset by \$1.7 million in professional fees for capital advisory services.

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(Benefit) provision from income taxes

(Dollars in thousands)	2018	2017	2016	Change
				2018 vs. 2017 vs. 2016
(Benefit) provision from income taxes	\$(22,160)	\$(12,313)	\$10,320	80% *
Effective income tax rate	192	% (14)% 19	%

* not meaningful

The provision for income taxes represents current and future amounts owed for federal, state, and foreign taxes. 2018 Compared to 2017

The increase in our effective income tax rate was primarily due to a change in our jurisdictional mix of earnings including a lower proportion of U.S. income.

As of December 31, 2018, the Company had approximately \$18.2 million of total unrecognized tax benefits, which would decrease the Company's effective tax rate if recognized. The Company expects that the changes in the unrecognized benefits within the next twelve months will be approximately \$0.5 million due to a lapse of applicable statute of limitations.

2017 Compared to 2016

The decrease in our effective income tax rate was primarily due to an increase in excess tax benefits on share-based payments recognized in income tax expense along with an additional benefit of \$14.2 million recorded in 2017 to re-measure our deferred income taxes under ASC 606 to the new U.S. statutory tax rate as a result of the Tax Cuts and Jobs Act.

As of December 31, 2017 and 2016, we had \$19.2 million and \$22.7 million, respectively, of total unrecognized tax benefits, which would decrease our effective tax rate if recognized.

LIQUIDITY AND CAPITAL RESOURCES

(in thousands)	2018	2017	2016
Cash provided by (used in):			
Operating activities	\$104,356	\$158,235	\$39,874
Investing activities	(48,196)	(14,759)	(7,172)
Financing activities	(101,460)	(54,229)	(51,716)
Effect of exchange rate on cash and cash equivalents	(2,557)	2,438	(3,418)
Net (decrease) increase in cash and cash equivalents	\$(47,857)	\$91,685	\$(22,432)

December 31,

(in thousands)	2018	2017	2016
Held in U.S. entities	\$143,533	\$136,444	\$82,008
Held in foreign entities	63,890	87,304	51,753
Total cash, cash equivalents, and marketable securities	\$207,423	\$223,748	\$133,761

We believe that our current cash, cash equivalents, marketable securities, and cash flow from operations will be sufficient to fund our operations, quarterly cash dividends, and stock repurchases for at least the next 12 months. If it becomes necessary to repatriate foreign funds, we may be required to pay U.S. state and local taxes, as well as foreign taxes, upon repatriation. Due to the complexity of income tax laws and regulations, it is impracticable to estimate the amount of taxes we would have to pay. See "If it becomes necessary to repatriate any of our foreign cash balances to the United States, we may be subject to increased income taxes, other restrictions, and limitations" in Item 1A of this Annual Report for additional information.

Cash provided by operating activities

We expect client preferences to continue to shift in favor of cloud arrangements, which could result in slower operating cash flow growth in the near term. Cash from cloud arrangements is typically collected over the service period, while cash from perpetual license arrangements is typically collected upfront, shortly after the license rights become effective.

The primary cash drivers during 2018 were net income of \$10.6 million and \$25.8 million from accounts receivable, largely due to increased cash collections and the timing of billings.

The primary cash driver during 2017 was net income of \$98.5 million.

The primary cash driver during 2016 was net income of \$45 million.

Cash used in investing activities

Cash used in investing activities is primarily driven by the timing of investment maturities and purchases of new investments.

During 2018, we purchased \$69.5 million of investments, primarily marketable debt securities, and made investments of \$11.9 million in property and equipment, partially offset by proceeds received from maturities of investments, including called investment securities of \$34 million.

During 2017, we purchased \$27.7 million of investments, primarily marketable debt securities, and made investments of \$13.7 million in property and equipment, partially offset by proceeds received from maturities of investments, including called investment securities of \$27 million.

During 2016, we acquired OpenSpan, Inc. for \$48.8 million, net of cash acquired, and invested \$19.1 million primarily in internally developed software and leasehold improvements at our corporate headquarters and our office in Hyderabad, India, partially offset by proceeds received from the sales of investments of \$62.2 million.

Cash used in financing activities

We used cash primarily for repurchases of our common stock under our stock repurchase programs, stock repurchases for tax withholdings for the net settlement of our equity awards, and the payment of our quarterly dividend.

Net cash used in financing activities during 2018, 2017, and 2016 was primarily for repurchases of our common stock and the payment of our quarterly dividend.

Dividends

(in thousands)	2018	2017	2016
Dividend payments to shareholders	\$9,432	\$9,277	\$9,174

It is our current intention to pay a quarterly cash dividend of \$0.03 per share, however, the Board of Directors may terminate or modify this dividend program at any time without prior notice.

Stock repurchase program ⁽¹⁾

Remaining authority under existing programs is:

(in thousands) 2018	
January 1,	\$34,892
Authorizations	27,003
Repurchases (55,275)	
December 31,	\$6,620

⁽¹⁾ Purchases under these programs have been made on the open market. See "10. Stockholders' Equity" in Item 8 of this Annual Report for additional information.

Common stock repurchases

The following table is a summary of our repurchase activity:

(in thousands)	2018		2017		2016	
	Shares	Amount	Shares	Amount	Shares	Amount
Tax withholdings for net settlement of equity awards	667	\$39,588	818	\$41,825	572	\$16,183
Repurchases paid	980	54,276	96	4,335	1,078	27,028
Repurchases unsettled at period end	21	999	3	158	—	—
Total stock repurchase program ⁽¹⁾	1,001	55,275	99	4,493	1,078	27,028
Activity in period ⁽²⁾	1,668	\$94,863	917	\$46,318	1,650	\$43,211

⁽¹⁾ Represents activity under the Company's publicly announced stock repurchase program.

⁽²⁾ During 2018, 2017, and 2016, instead of receiving cash from the equity holders, we withheld shares with a value of \$29.5 million, \$28.1 million, and \$18.1 million, respectively, for the exercise price of options. These amounts have been excluded from the table above.

Contractual obligations

As of December 31, 2018, our contractual obligations were:

(in thousands)	Payments due by period					
	Total	2019	2020-2021	2022-2023	2024 and thereafter	Other
Purchase obligations ⁽¹⁾	\$27,203	\$16,203	\$ 11,000	\$ —	\$ —	—\$—
Investment commitments ⁽²⁾	1,000	1,000	—	—	—	—
Liability for uncertain tax positions ⁽³⁾	3,033	—	—	—	—	3,033
Operating lease obligations ^{(4) (5)}	67,425	15,993	28,069	23,363	—	—
Total	\$98,661	\$33,196	\$ 39,069	\$ 23,363	\$ —	—\$3,033

⁽¹⁾ Represents the fixed or minimum amounts due under purchase obligations for hosting services and sales and marketing programs.

⁽²⁾ Represents the maximum funding that would be required under existing investment agreements with privately-held companies. The Company's investment agreements generally allow the Company to withhold unpaid committed funds at its discretion.

⁽³⁾ We are unable to reasonably estimate the timing of the cash outflow due to uncertainties in the timing of the effective settlement of tax positions.

⁽⁴⁾ Includes deferred rent of approximately \$2.6 million included in accrued expenses and approximately \$7.4 million in other long-term liabilities as of December 31, 2018 in the Consolidated Balance Sheet in Item 8 of this Annual Report.

⁽⁵⁾ See "Item 2. Properties" of this Annual Report for additional information.

CRITICAL ACCOUNTING ESTIMATES AND SIGNIFICANT JUDGMENTS

Management's discussion and analysis of the financial condition and results of operations is based upon our consolidated financial statements, which have been prepared in accordance with accounting principles generally accepted in the U.S. and the rules and regulations of the SEC for annual financial reporting. The preparation of these financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses, and related disclosure of contingent assets and liabilities. We base our estimates and judgments on historical experience, knowledge of current conditions and beliefs of what could occur in the future given available information.

We believe that, of our significant accounting policies, which are described in "2. Significant Accounting Policies" in Item 8 of this Annual Report, the following accounting policies are most important to the portrayal of our financial condition and require the most subjective judgment. Accordingly, these are the policies we believe are the most critical to aid in fully understanding and evaluating our consolidated financial condition and results of operations. If actual results differ significantly from management's estimates and projections, there could be a material effect on our financial statements.

Revenue recognition

We account for revenue in accordance with ASC 606. Our revenue recognition policies require us to make significant judgments and estimates.

Our clients' contracts with us typically contain promises by us to provide multiple products and services. Specifically, contracts associated with sales of the Company Pega Platform and other software applications, sold either as licenses to use functional intellectual property or as a cloud-based solution, typically include various forms of consulting.

Determining whether such products and services within a client contract are considered distinct performance obligations that should be accounted for separately requires significant judgment. We review client contracts to identify all separate promises to transfer goods and services that would be considered performance obligations. Judgment is also required in determining whether an option to acquire additional products and services within a client contract represents a material right that the client would not receive without entering into the contract.

We allocate the transaction price to the distinct performance obligations, including options in contracts that are determined to represent a material right, based on relative standalone selling price of each performance obligation.

Judgment is required in estimating standalone selling prices. We maximize the use of observable inputs by maintaining pricing analysis that includes our pricing policies, historical standalone sales when they exist, and

historical renewal prices charged to clients. We have concluded that the standalone selling prices of certain performance obligations, specifically the standalone selling prices for software licenses and cloud arrangements, are highly variable. In these instances, we estimate the standalone selling prices using the residual approach, determined based on total transaction price minus the standalone selling price of other performance obligations promised in the contract. We update our standalone selling price analysis periodically, which includes a re-assessment as to whether the residual approach used to determine the standalone selling prices for software licenses and cloud arrangements remains appropriate.

Changes in the assumptions or judgments used in determining the performance obligations in client contracts and used in determining standalone selling prices could have a significant impact on the timing and amount of revenue we report in a particular period.

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Goodwill and intangible assets impairment

Our goodwill and intangible assets result from our previous business acquisitions. Goodwill and intangible assets with indefinite useful lives are not amortized but are tested for impairment at least annually or as circumstances indicate their value may no longer be recoverable. We do not carry any intangible assets with indefinite useful lives other than goodwill. We perform our annual goodwill impairment as of November 30th of each fiscal year. To assess if goodwill is impaired, we first perform a qualitative assessment to determine whether further impairment testing is necessary. If, based on the qualitative assessment, we consider it more-likely-than-not that the fair value of our reporting unit is less than its carrying amount, we perform a quantitative impairment test in a two-step process. For the first step, we screen for impairment, and if any possible impairment exists, we undertake a second step of measuring such impairment by performing discounted cash flow analysis. This analysis is based on cash flow assumptions that are consistent with the plans and estimates being used to manage our business. In the first step, we review the carrying amount of our reporting unit compared to the “fair value” of the reporting unit. An excess carrying value over fair value would indicate that goodwill may be impaired. If we determined that goodwill may be impaired, then we would compare the “implied fair value” to the carrying value of the goodwill. We periodically re-evaluate our business and have determined that we have one operating segment and one reporting unit. If our assumptions change in the future, we may be required to record impairment charges to reduce the carrying value of our goodwill. Changes in the valuation of goodwill could materially impact our operating results and financial position. We evaluate our intangible assets for impairment whenever events or changes in circumstances indicate that the carrying amount of such assets may not be recoverable. In evaluating potential impairment of these assets, we specifically consider whether any indicators of impairment are present, including, but not limited to:

- whether there has been a significant adverse change in the business climate that affects the value of an asset;
- whether there has been a significant change in the extent or way an asset is used;
- and

- whether there is an expectation that the asset will be sold or disposed of before the end of its originally estimated useful life.

If indicators of impairment are present, we compare the estimated undiscounted cash flows that the specific asset is expected to generate to its carrying value. The key assumptions of the cash flow model involve significant subjectivity. If such assets are impaired, the impairment recognized is measured by the amount by which the carrying amount of the asset exceeds its fair value.

As of December 31, 2018, we had \$72.9 million of goodwill and \$21.2 million of intangible assets. If our estimates or the related assumptions change in the future, we may be required to record impairment charges to reduce or eliminate the carrying value of these assets. Changes in the valuation of long-lived assets could materially impact our operating results and financial position. To date, there have been no impairments of goodwill or intangible assets.

Accounting for income taxes

Significant judgment is required in determining our provision for income taxes and income tax assets and liabilities, including evaluating uncertainties in the application of accounting principles and complex tax laws. Changes in tax laws or our interpretation of tax laws and the resolution of any tax audits could significantly impact our financial statements.

We regularly assess the need for a valuation allowance against our deferred tax assets. Future realization of our deferred tax assets ultimately depends on the existence of sufficient taxable income within the available carryback or carryforward periods. We record a valuation allowance to reduce our deferred tax assets to an amount we believe is more likely than not to be realized. Changes in our valuation allowance impact income tax expense in the period of adjustment. Our deferred tax valuation allowance requires significant judgment and uncertainties, including assumptions about future taxable income that are based on historical and projected information.

We assess our income tax positions and record tax benefits based upon management’s evaluation of the facts, circumstances, and information available at the reporting date. For those tax positions where it is more-likely-than-not that a tax benefit will be sustained, we record the largest amount of tax benefit with a greater than 50 percent likelihood of being realized upon ultimate settlement with a taxing authority having full knowledge of all relevant information. For those income tax positions where it is not more-likely-than-not that a tax benefit will be sustained, no tax benefit is recognized in the financial statements.

As a global company, we use significant judgment to calculate and provide for income taxes in each of the tax jurisdictions in which we operate. In the ordinary course of our business, there are transactions and calculations undertaken whose ultimate tax outcome cannot be certain. Some of these uncertainties arise as a consequence of transfer pricing for transactions with our subsidiaries and nexus and tax credit estimates. In addition, the calculation of acquired tax attributes and the associated limitations are complex. We estimate our exposure to unfavorable outcomes related to these uncertainties and estimate the probability of such outcomes.

Although we believe our estimates are reasonable, no assurance can be given that the final tax outcome will not be different from what is reflected in our historical income tax provisions, returns, and accruals. Such differences, or changes in estimates relating to potential differences, could have a material impact on our income tax provision and operating results in the period in which such a determination is made.

See "15. Income Taxes" in Item 8 of this Annual Report for additional information.

NEW ACCOUNTING PRONOUNCEMENTS

See "2. Significant Accounting Policies" in Item 8 of this Annual Report for additional information.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Market risk represents the risk of loss that may affect us due to adverse changes in financial market prices and rates.

Foreign currency exposure

Translation risk

Our international sales are usually denominated in foreign currencies. However, the operating expenses of our foreign operations are also primarily denominated in foreign currencies, which partially offsets our foreign currency exposure.

A hypothetical 10% strengthening in the U.S. dollar against other currencies would result in the following impact:

	2018	2017	2016
(Decrease) increase in revenue	(4)%	(4)%	(4)%
(Decrease) increase in net income	(1)%	(3)%	(1)%

Remeasurement risk

We experience fluctuations in transaction gains or losses from remeasurement of monetary assets and liabilities that are denominated in currencies other than the functional currency of the entities in which they are recorded.

We are primarily exposed to changes in foreign currency exchange rates associated with Australian dollar, Euro, and U.S. dollar denominated cash and cash equivalents, accounts receivable, unbilled receivables, and intercompany receivables and payables held by our U.K. subsidiary, a British pound functional entity.

A hypothetical 10% strengthening in the British pound exchange rate in comparison to the Australian dollar, Euro, and U.S. dollar would result in the following impact:

(in millions)	2018	2017	2016
(Reduction) increase in foreign currency gain	\$(6)	\$(6)	\$(7)

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of Pegasystems Inc.
Cambridge, Massachusetts

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Pegasystems Inc. and subsidiaries (the “Company”) as of December 31, 2018 and 2017, the related consolidated statements of operations, comprehensive income, stockholders’ equity, and cash flows for each of the three years in the period ended December 31, 2018, and the related notes (collectively referred to as the “financial statements”). We also have audited the Company’s internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, in conformity with accounting principles generally accepted in the United States of America. Also, in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control – Integrated Framework (2013) issued by COSO.

Basis for Opinions

The Company’s management is responsible for these financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management’s Report on and Changes in Internal Control over Financial Reporting. Our responsibility is to express an opinion on these financial statements and an opinion on the Company’s internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (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 audits to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the financial statements included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures to respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. 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 audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Change in Accounting Principles

As discussed in "Note 2. Significant Accounting Policies" to the financial statements, the Company adopted Accounting Standards Codification (ASC) Topic 606, “Revenue from Contracts with Customers,” using the full retrospective adoption method on January 1, 2018.

Definition and Limitations of Internal Control over Financial Reporting

A company’s internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company’s internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly

reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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

/s/ DELOITTE & TOUCHE LLP

Boston, Massachusetts

February 20, 2019

We have served as the Company's auditor since 2000.

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PEGASYSTEMS INC.
CONSOLIDATED BALANCE SHEETS ⁽¹⁾
(in thousands, except per share amounts)

	December 31,	
	2018	2017
Assets		
Current assets:		
Cash and cash equivalents	\$114,422	\$162,279
Marketable securities	93,001	61,469
Total cash, cash equivalents, and marketable securities	207,423	223,748
Accounts receivable	180,872	222,735
Unbilled receivables	172,656	160,084
Other current assets	49,684	41,135
Total current assets	610,635	647,702
Long-term unbilled receivables	151,237	160,708
Goodwill	72,858	72,952
Other long-term assets	147,823	131,391
Total assets	\$982,553	\$1,012,753
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	\$16,487	\$17,370
Accrued expenses	45,506	45,508
Accrued compensation and related expenses	84,671	66,040
Deferred revenue	185,145	165,850
Total current liabilities	331,809	294,768
Deferred income tax liabilities	6,939	38,463
Other long-term liabilities	22,274	23,652
Total liabilities	361,022	356,883
Commitments and Contingencies (Note 19)		
Stockholders' equity:		
Preferred stock, \$0.01 par value, 1,000 shares authorized; none issued	—	—
Common stock, \$0.01 par value, 200,000 shares authorized; 78,526 and 78,081 shares issued and outstanding at December 31, 2018 and 2017, respectively	785	781
Additional paid-in capital	123,205	152,097
Retained earnings	510,863	509,697
Accumulated other comprehensive loss:		
Net unrealized loss on available-for-sale marketable securities, net of tax	(249)	(232)
Foreign currency translation adjustments	(13,073)	(6,473)
Total stockholders' equity	621,531	655,870
Total liabilities and stockholders' equity	\$982,553	\$1,012,753

⁽¹⁾ On January 1, 2018, the Company adopted the ASC 606 revenue recognition standard and adjusted prior periods to conform. See "Note 2. Significant Accounting Policies" for additional information.

See notes to consolidated financial statements.

PEGASYSTEMS INC.
CONSOLIDATED STATEMENTS OF OPERATIONS ⁽¹⁾
(in thousands, except per share amounts)

	2018	2017	2016
Revenue			
Software license	\$288,119	\$339,294	\$297,284
Maintenance	263,875	242,320	218,635
Services	339,587	306,853	246,310
Total revenue	891,581	888,467	762,229
Cost of revenue			
Software license	5,169	5,085	4,943
Maintenance	24,565	27,905	25,505
Services	272,031	246,683	208,808
Total cost of revenue	301,765	279,673	239,256
Gross profit	589,816	608,794	522,973
Operating expenses			
Selling and marketing	373,495	300,578	277,927
Research and development	181,710	162,886	145,548
General and administrative	51,643	52,153	45,951
Acquisition-related	—	—	2,903
Total operating expenses	606,848	515,617	472,329
(Loss) income from operations	(17,032)	93,177	50,644
Foreign currency transaction gain (loss)	2,421	(6,413)	9,360
Interest income, net	2,705	862	911
Other income (expense), net	363	(1,391)	(5,580)
(Loss) income before (benefit) provision from income taxes	(11,543)	86,235	55,335
(Benefit) provision from income taxes	(22,160)	(12,313)	10,320
Net income	\$10,617	\$98,548	\$45,015
Earnings per share:			
Basic	\$0.14	\$1.27	\$0.59
Diluted	\$0.13	\$1.19	\$0.56
Weighted-average number of common shares outstanding			
Basic	78,564	77,431	76,343
Diluted	83,064	82,832	79,732

⁽¹⁾ On January 1, 2018, the Company adopted the ASC 606 revenue recognition standard and adjusted prior periods to conform. See "Note 2. Significant Accounting Policies" for additional information.

See notes to consolidated financial statements.

PEGASYSTEMS INC.
 CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME ⁽¹⁾
 (in thousands)

	2018	2017	2016
Net income	\$10,617	\$98,548	\$45,015
Other comprehensive (loss) income, net of tax			
Unrealized loss on available-for-sale marketable securities, net of tax	(17)	(63)	(19)
Foreign currency translation adjustments	(6,600)	9,559	(12,675)
Total other comprehensive (loss) income, net of tax	(6,617)	9,496	(12,694)
Comprehensive income	\$4,000	\$108,044	\$32,321

⁽¹⁾ On January 1, 2018, the Company adopted the ASC 606 revenue recognition standard and adjusted prior periods to conform. See "Note 2. Significant Accounting Policies" for additional information.

See notes to consolidated financial statements.

PEGASYSTEMS INC.

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY⁽¹⁾

(in thousands, except per share amounts)

	Common Stock Number of Shares	Common Stock Amount	Additional Paid-In Capital	Retained Earnings	Accumulated Other Comprehensive (Loss) Income	Total Stockholders' Equity
Balance at January 1, 2016	76,488	\$ 765	\$ 145,418	\$ 384,311	\$ (3,507)	\$ 526,987
Cumulative-effect adjustment from adoption of ASU 2016-09	—	—	—	321	—	321
Repurchase of common stock	(1,078)	(11)	(27,017)	—	—	(27,028)
Issuance of common stock for share-based compensation plans	1,161	12	(15,868)	—	—	(15,856)
Issuance of common stock under Employee Stock Purchase Plan	20	—	562	—	—	562
Stock-based compensation	—	—	40,808	—	—	40,808
Cash dividends declared (\$0.12 per share)	—	—	—	(9,175)	—	(9,175)
Other comprehensive loss	—	—	—	—	(12,694)	(12,694)
Net income	—	\$ —	\$ —	\$ 45,015	\$ —	\$ 45,015
December 31, 2016	76,591	\$ 766	\$ 143,903	\$ 420,472	\$ (16,201)	\$ 548,940
Repurchase of common stock	(99)	—	(4,493)	—	—	(4,493)
Issuance of common stock for share-based compensation plans	1,568	15	(41,642)	—	—	(41,627)
Issuance of common stock under Employee Stock Purchase Plan	21	—	1,009	—	—	1,009
Stock-based compensation	—	—	53,320	—	—	53,320
Cash dividends declared (\$0.12 per share)	—	—	—	(9,323)	—	(9,323)
Other comprehensive income	—	—	—	—	9,496	9,496
Net income	—	—	—	98,548	—	98,548
December 31, 2017	78,081	\$ 781	\$ 152,097	\$ 509,697	\$ (6,705)	\$ 655,870
Repurchase of common stock	(1,001)	(10)	(55,265)	—	—	(55,275)
Issuance of common stock for share-based compensation plans	1,413	14	(39,375)	—	—	(39,361)
Issuance of common stock under Employee Stock Purchase Plan	33	—	1,767	—	—	1,767
Stock-based compensation	—	—	63,981	—	—	63,981
Cash dividends declared (\$0.12 per share)	—	—	—	(9,451)	—	(9,451)
Other comprehensive loss	—	—	—	—	(6,617)	(6,617)
Net income	—	—	—	10,617	—	10,617
December 31, 2018	78,526	\$ 785	\$ 123,205	\$ 510,863	\$ (13,322)	\$ 621,531

⁽¹⁾ On January 1, 2018, the Company adopted the ASC 606 revenue recognition standard and adjusted prior periods to conform. See "Note 2. Significant Accounting Policies" for additional information.

See notes to consolidated financial statements.

PEGASYSTEMS INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS ⁽¹⁾
(in thousands)

	2018	2017	2016
Operating activities:			
Net income	\$10,617	\$98,548	\$45,015
Adjustment to reconcile net income to cash provided by operating activities:			
Deferred income taxes	(30,898)	(2,780)	(4,398)
Amortization of intangible assets and depreciation	25,295	24,713	24,137
Amortization of deferred contract costs	17,271	12,106	11,574
Amortization of investments	1,596	1,381	1,862
Stock-based compensation expense	63,862	53,313	40,821
Foreign currency transaction (gain) loss	(2,421)	6,413	(9,360)
Other non-cash	(1,678)	(1,383)	(1,382)
Change in operating assets and liabilities:			
Accounts receivable, unbilled revenue, and contract assets	25,779	(30,379)	(49,503)
Income taxes receivable and other current assets	(6,068)	(13,393)	(10,818)
Accounts payable, accrued compensation, and accrued expenses	20,798	14,473	1,531
Deferred revenue	28,951	14,636	2,639
Deferred contract costs	(44,036)	(18,738)	(12,497)
Other long-term assets and liabilities	(4,712)	(675)	253
Cash provided by operating activities	104,356	158,235	39,874
Investing activities:			
Purchases of investments	(69,494)	(27,718)	(23,969)
Proceeds from maturities and called investments	33,991	26,997	22,788
Sales of investments	—	—	62,210
Payments for acquisitions, net of cash acquired	(800)	(297)	(49,113)
Investment in property and equipment	(11,893)	(13,741)	(19,088)
Cash used in investing activities	(48,196)	(14,759)	(7,172)
Financing activities:			
Dividend payments to shareholders	(9,432)	(9,277)	(9,174)
Common stock repurchases for tax withholdings for net settlement of equity awards	(37,594)	(40,617)	(15,294)
Common stock repurchases under stock repurchase program	(54,434)	(4,335)	(27,248)
Cash used in financing activities	(101,460)	(54,229)	(51,716)
Effect of exchange rate on cash and cash equivalents	(2,557)	2,438	(3,418)
Net (decrease) increase in cash and cash equivalents	(47,857)	91,685	(22,432)
Cash and cash equivalents, beginning of period	162,279	70,594	93,026
Cash and cash equivalents, end of period	\$114,422	\$162,279	\$70,594
Supplemental disclosures:			
Income taxes paid (refunded)	\$6,630	\$(2,322)	\$28,844
Non-cash investing and financing activity:			
Dividends payable	\$2,363	\$2,344	\$2,298

⁽¹⁾ On January 1, 2018, the Company adopted the ASC 606 revenue recognition standard and adjusted prior periods to conform. See "Note 2. Significant Accounting Policies" for additional information.

See notes to consolidated financial statements.

PEGASYSTEMS INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1. BASIS OF PRESENTATION

Business

The Company develops, markets, licenses, and supports customer engagement and digital process automation software applications in addition to the Pega Platform™ for clients that wish to build and extend their own applications. The Company provides consulting, training, support, and hosting services to facilitate the use of its software.

Management estimates and reporting

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America ("U.S.") requires management to make estimates and judgments that 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 revenues and expenses during the periods presented. Actual results could differ from those estimates. Accounts with reported amounts based on significant estimates and judgments include, but are not limited to, revenue, unbilled receivables, deferred revenue, deferred income taxes, deferred contract costs, income taxes payable, intangible assets, and goodwill.

On January 1, 2018, the Company adopted Accounting Standards Update ("ASU") No. 2014-09, "Revenue from Contracts with Customers (Topic 606)", using the full retrospective method which required that each prior reporting period presented be adjusted to reflect the application of this ASU. See "Note 2. Significant Accounting Policies" for additional information.

Principles of consolidation

The Company's consolidated financial statements reflect Pegasystems Inc. and subsidiaries in which the Company holds a controlling financial interest.

2. SIGNIFICANT ACCOUNTING POLICIES

Revenue

The Company's revenue is primarily derived from:

- software license revenue from sales of the Company's Pega Platform and software applications. Software licenses represent functional intellectual property and are delivered separately from maintenance and services.
- maintenance revenue from client support including software upgrades (on a when and-if available basis), telephone support, and bug fixes or patches.
- services revenue from cloud revenue, which is sales of the Company's hosted Pega Platform and software applications, and consulting revenue, which is primarily related to new software license implementations, training, and reimbursable costs.

Performance Obligations

The Company's software license and cloud arrangements often contain multiple performance obligations. For contracts with multiple performance obligations, the Company accounts for individual performance obligations separately if they are distinct. Transaction price is allocated to the separate performance obligations on a relative stand-alone selling price basis. If the transaction price contains discounts or the Company expects to provide a future price concession, these elements are considered when determining the transaction price prior to allocation. The Company's policy is to exclude from the determination of transaction price sales and similar taxes collected from clients.

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The Company's typical performance obligations are:

Performance Obligation	How Standalone Selling Price is Typically Determined	When Performance Obligation is Typically Satisfied	When Payment is Typically Due
Perpetual license	Residual approach	Upon transfer of control to the client, defined when the client can use and benefit from the license (point in time)	Effective date of the license
Term license	Residual approach	Upon transfer of control to the client, defined when the client can use and benefit from the license (point in time)	Annually, or more frequently, over the term of the license
Maintenance	Consistent pricing relationship as a percentage of the related license and observable in stand-alone renewal transactions ⁽¹⁾	Ratably over the term of the maintenance (over time)	Annually, or more frequently, over the term of maintenance
Consulting - time and materials	Observable hourly rate for time and materials-based services in similar geographies for similar contract sizes	Based on hours incurred to date	Monthly
Consulting - fixed price	Observable hourly rate for time and materials-based services in similar geographies for similar contract sizes multiplied by estimated hours for the project	Based on hours incurred as a percentage of total estimated hours	As contract milestones are achieved
Cloud	Residual approach	Ratably over the term of the service (over time)	Annually, or more frequently, over the term of the service

⁽¹⁾ Technical support and software updates are considered distinct services but accounted for as a single performance obligation, as they have the same pattern of transfer to the client.

The Company utilizes the residual approach for performance obligations since the selling price is highly variable and stand-alone selling price is not discernible from past transactions or other observable evidence. Periodically, the Company reevaluates whether the residual approach remains appropriate. As required the Company evaluates its residual approach estimate compared to all available observable data in order to conclude the estimate is representative of its standalone selling price.

If the contract grants the client the option to acquire additional products or services, the Company assesses whether the option represents a material right to the client that the client would not receive without entering into that contract. Discounts on options to purchase additional products and services that are in excess of discounts available to similar clients are accounted for as an additional performance obligation.

Variable consideration

The Company's arrangements can include variable fees, such as the option to purchase additional usage of a previously delivered software license. In addition, the Company may provide pricing concessions to clients, a business practice that also gives rise to variable fees in contracts. The Company includes in the determination of total transaction price an estimate of variable fees if it is probable that a significant reversal of cumulative revenue recognized will not occur. The Company uses the expected value method to estimate variable consideration and the estimates are based on expected purchase volumes and the level of historical price concessions offered to clients.

Significant financing components

The Company generally does not intend to provide financing to its clients, as financing arrangements are not contemplated as part of the negotiated terms of contracts between the Company and its clients. Although there may be instances with an intervening period between the delivery of the license and the payment, typically in term license arrangements, the purpose of that timing difference is to align the client's payment with the timing of the use of the software license or service.

In certain circumstances, however, there are instances where the timing of revenue recognition differs from the timing of payment due to extended payment terms or fees that are non-proportional to the associated usage of software licenses. In these instances, the Company evaluates whether a significant financing component exists. This evaluation includes determining the difference between the consideration the client would have paid at the time the performance obligation was satisfied and the amount of consideration actually paid. Contracts that include a significant financing component are adjusted for the time value of money at the rate inherent in the contract, the client's borrowing rate, or the Company's incremental borrowing rate depending upon the recipient of the financing.

During 2018, 2017 and 2016, significant financing components were not material.

Contract modifications

The Company assesses contract modifications to determine:

- if the additional products and services are distinct from the products and services in the original arrangement; and
- if the amount of consideration expected for the added products and services reflects the stand-alone selling price of those products and services.

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:

- a prospective basis as a termination of the existing contract and the creation of a new contract; or
- a cumulative catch-up basis.

Deferred contract costs

The Company recognizes an asset for the incremental costs of obtaining a client contract, primarily related to sales commissions, if the Company expects to benefit from those costs for more than one year. Deferred contract costs are allocated to each performance obligation within the contract and amortized over the expected benefit period of the related performance obligations. The expected benefit period is determined based on the length of the client contracts, client attrition rates, the underlying technology life-cycle, and the influence of the competitive marketplace in which the products and services are sold. Deferred costs for maintenance renewals and cloud arrangements are amortized over an average expected benefit period of five years. Deferred costs for software licenses and consulting are amortized over a period that is consistent with the pattern of transfer of control for the related products and services.

Financial instruments

The principal financial instruments held by the Company consist of cash equivalents, marketable securities, receivables, and accounts payable. The Company considers debt securities that are readily convertible to known amounts of cash with maturities of three months or less from the purchase date to be cash equivalents. Interest is recorded when earned. All of the Company's investments are classified as available-for-sale and are carried at fair value. Unrealized gains and losses considered to be temporary in nature are recorded as a component of accumulated other comprehensive loss, net of related income taxes. The Company reviews all investments for reductions in fair value that are other-than-temporary. When such reductions occur, the cost of the investment is adjusted to fair value through recording a loss on investments in the consolidated statements of operations. Gains and losses on investments are calculated based upon the specific investment.

See "Note 4. Receivables, Contract Assets, And Deferred Revenue" and "Note 11. Fair Value Measurements" for additional information.

Property and equipment

Property and equipment are recorded at cost. Depreciation and amortization are computed using the straight-line method over the estimated useful lives of the assets, which are three years for computer equipment and five years for furniture and fixtures. Leasehold improvements are amortized over the lesser of the term of the lease or the useful life of the asset. Repairs and maintenance costs are expensed as incurred.

Internal-use software

The Company capitalizes and amortizes certain direct costs associated with computer software developed or purchased for internal use incurred during the application development stage. Costs related to preliminary project activities and post implementation activities are expensed as incurred. The Company amortizes capitalized software costs generally over three to five years, commencing on the date the software is placed into service.

Goodwill

Goodwill represents the residual purchase price paid in a business combination after the fair value of all identified assets and liabilities have been recorded. Goodwill is not amortized. The Company has a single reporting unit. The Company performed a qualitative assessment as of November 30, 2018, 2017, and 2016, and concluded that there was no impairment since it was not more likely than not that the fair value of its reporting unit was less than its carrying value.

Intangible and long-lived assets

All of the Company's intangible assets are amortized using the straight-line method over their estimated useful life. The Company evaluates its long-lived tangible and intangible assets for impairment whenever events or changes in circumstances indicate that the carrying amount of such assets may not be recoverable. Impairment is assessed by comparing the undiscounted cash flows expected to be generated by the intangible asset to its carrying value. If impairment exists, the Company calculates the impairment by comparing the carrying value of the intangible asset to its fair value as determined by discounted expected cash flows.

The Company did not have any impairments in the 2018, 2017, or 2016.

Business combinations

The Company uses its best estimates and assumptions to accurately assign fair value to the tangible and intangible assets acquired and liabilities assumed at the acquisition date. The Company's estimates are inherently uncertain and subject to refinement. During the measurement period, which may be up to one year from the acquisition date, the Company may record adjustments to the fair value of these tangible and intangible assets acquired and liabilities assumed, with the corresponding offset to goodwill. In addition, uncertain tax positions and tax-related valuation allowances are initially established in connection with a business combination as of the acquisition date. The

Company continues to collect information and reevaluates these estimates and assumptions quarterly and records any adjustments to the Company's preliminary estimates to goodwill provided that the Company is within the measurement period. Upon the conclusion of the measurement period or final determination of the fair value of assets acquired or liabilities assumed, whichever comes first, any subsequent adjustments are recorded to the Company's consolidated statements of operations.

Research and development and software development costs

Research and development costs are expensed as incurred. Capitalization of computer software developed for resale begins upon the establishment of technological feasibility, generally demonstrated by a working model or an operative version of the computer software product. Such costs have not been material to date, as technological feasibility is established within a short time frame from the software's general availability and, as a result, no costs were capitalized in 2018, 2017, or 2016.

Stock-based compensation

The Company recognizes stock-based compensation expense associated with equity awards based on the fair value of these awards at the grant date. Stock-based compensation is recognized over the requisite service period, which is generally the vesting period of the equity award and is adjusted each period for anticipated forfeitures. See "Note 13. Stock-Based Compensation" for discussion of the Company's key assumptions included in determining the fair value of its equity awards at the grant date.

Foreign currency translation and remeasurement

The translation of assets and liabilities for the Company's subsidiaries with functional currencies other than the U.S. dollar are made at period-end exchange rates. Revenue and expense accounts are translated at the average exchange rates during the period transactions occurred. The resulting translation adjustments are reflected in accumulated other comprehensive income. Realized and unrealized exchange gains or losses from transactions and remeasurement adjustments are reflected in foreign currency transaction gain (loss) in the accompanying consolidated statements of operations.

Accounting for income taxes

The Company uses the asset and liability method of accounting for income taxes. Under this method, deferred tax assets and liabilities are determined based on temporary differences between the financial statement and tax basis of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. The Company regularly assesses the need for a valuation allowance against its deferred tax assets. Future realization of the Company's deferred tax assets ultimately depends on the existence of sufficient taxable income within the available carryback or carryforward periods. Sources of taxable income include taxable income in prior carryback years, future reversals of existing taxable temporary differences, tax planning strategies, and future taxable income. The Company records a valuation allowance to reduce its deferred tax assets to an amount it believes is more-likely-than-not to be realized. Changes in the valuation allowance impacts income tax expense in the period of adjustment. The Company's deferred tax valuation allowance requires significant judgment and uncertainties, including assumptions about future taxable income that are based on historical and projected information. The Company recognizes excess tax benefits when they are realized, as a reduction of the provision for income taxes.

The Company assesses its income tax positions and records tax benefits based upon management's evaluation of the facts, circumstances, and information available at the reporting date. For those tax positions where it is more-likely-than-not that a tax benefit will be sustained, the Company records the largest amount of tax benefit with a greater than 50 percent likelihood of being realized upon ultimate settlement with a taxing authority having full knowledge of all relevant information. For those income tax positions where it is not more-likely-than-not that a tax benefit will be sustained, no tax benefit is recognized in the financial statements. The Company classifies liabilities for uncertain tax positions as non-current liabilities unless the uncertainty is expected to be resolved within one year. The Company classifies interest and penalties on uncertain tax positions as income tax expense.

As a global company, the Company uses significant judgment to calculate and provide for income taxes in each of the tax jurisdictions in which it operates. In the ordinary course of the Company's business, there are transactions and calculations undertaken whose ultimate tax outcome cannot be certain. Some of these uncertainties arise as a consequence of transfer pricing for transactions with the Company's subsidiaries and nexus and tax credit estimates. In addition, the calculation of acquired tax attributes and the associated limitations are complex. See "Note 15. Income

Taxes" for additional information.

Advertising expense

Advertising costs are expensed as incurred. Advertising costs were \$6.9 million, \$6.1 million, and \$8.9 million during 2018, 2017, and 2016, respectively.

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Revenue Standard Adopted

On January 1, 2018, the Company adopted the ASC 606 revenue recognition standard and has adjusted prior periods to conform to the new standard.

The most significant adoption impacts were:

Perpetual licenses with extended payment terms and term licenses - Revenue from perpetual licenses with extended payment terms and term licenses is now recognized when control is transferred to the client, which is defined as the point in time when the client can use and benefit from the license. Previously, the Company recognized revenue over the term of the agreements as payments became due or earlier if prepaid. Any unrecognized license revenue from these arrangements is recognized in the period that control transfers or as a cumulative adjustment to retained earnings as of January 1, 2016. Unbilled receivables in the Company's consolidated balance sheets increased significantly upon adoption due to the revenue from term licenses being recognized prior to amounts being due, or prepaid, by clients and perpetual licenses with extended payment terms.

Allocation of future credits and significant discounts - Perpetual and term licenses are a separate performance obligation and the Company is now required to allocate any future credits and discounts to performance obligations in the arrangement based upon their relative stand-alone selling prices, determined using the residual approach.

Deferred contract costs - Sales incentive programs and other incremental costs to obtain a contract were previously expensed when incurred. ASC 340-40 requires these costs be recognized as an asset when incurred and expensed over the period of expected benefit, which is on average five years. This change primarily impacts the Company's contracts related to multi-year cloud offerings, maintenance on term and perpetual licenses, and multi-year term and perpetual licenses with client usage rights that increase over time.

For additional information on the Company's accounting policies because of the adoption of ASC 606 and ASC 340-40 see "Note 2. Significant Accounting Policies".

The impact of the adoption of ASC 606 and ASC 340-40 on the Company's consolidated balance sheet and consolidated statement of operations is:

(in thousands)	December 31, 2017		
	Previously Reported	Adjustments	As Adjusted
Assets			
Accounts receivable, unbilled receivables, and contract assets	\$248,331	\$ 135,402	\$383,733
Long-term unbilled receivables	—	160,708	160,708
Deferred income taxes	57,127	(42,887)	14,240
Deferred contract costs	—	37,924	37,924
Other assets ⁽¹⁾	416,148	—	416,148
Total assets	\$721,606	\$ 291,147	\$1,012,753
Liabilities and stockholders' equity			
Deferred revenue	\$195,073	\$ (29,223)	\$165,850
Long-term deferred revenue	6,591	(2,885)	3,706
Deferred income tax liabilities	—	38,463	38,463
Other liabilities ⁽²⁾	148,864	—	148,864
Total liabilities	350,528	6,355	356,883
Foreign currency translation adjustments	(3,494)	(2,979)	(6,473)
Retained earnings	221,926	287,771	509,697
Other equity ⁽³⁾	152,646	—	152,646
Total stockholders' equity	371,078	284,792	655,870
Total liabilities and stockholders' equity	\$721,606	\$ 291,147	\$1,012,753

⁽¹⁾ Includes cash, cash equivalents, marketable securities, income taxes receivable, other current assets, property and equipment, intangible assets, goodwill, and other long-term assets (as reflected in the consolidated balance sheets in the Annual Report on Form 10-K for the year ended December 31, 2017).

⁽²⁾ Includes accounts payable, accrued expenses, accrued compensation, and related expenses, income taxes payable, and other long-term liabilities (as reflected in the consolidated balance sheets in the Annual Report on Form 10-K for

the year ended December 31, 2017).

⁽³⁾ Includes common stock, additional paid-in capital, and net unrealized loss on available-for-sale marketable securities (as reflected in the consolidated balance sheets in the Annual Report on Form 10-K for the year ended December 31, 2017).

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(in thousands, except per share amounts)	2017			2016		
	Previously Reported	Adjustments	As Adjusted	Previously Reported	Adjustments	As Adjusted
Revenue:						
Software license	\$288,334	\$ 50,960	\$339,294	\$279,995	\$ 17,289	\$297,284
Maintenance	244,347	(2,027)	242,320	220,336	(1,701)	218,635
Services	307,901	(1,048)	306,853	249,935	(3,625)	246,310
Total revenue	840,582	47,885	888,467	750,266	11,963	762,229
Cost of revenue:						
Software license	5,085	—	5,085	4,943	—	4,943
Maintenance	27,905	—	27,905	25,505	—	25,505
Services	246,683	—	246,683	208,808	—	208,808
Total cost of revenue	279,673	—	279,673	239,256	—	239,256
Gross profit	560,909	47,885	608,794	511,010	11,963	522,973
Operating expenses:						
Selling and marketing	307,210	(6,632)	300,578	278,849	(922)	277,927
Research and development	162,886	—	162,886	145,548	—	145,548
General and administrative	52,153	—	52,153	45,951	—	45,951
Acquisition-related	—	—	—	2,903	—	2,903
Total operating expenses	522,249	(6,632)	515,617	473,251	(922)	472,329
Income from operations	38,660	54,517	93,177	37,759	12,885	50,644
Foreign currency transaction (loss) gain	(900)	(5,513)	(6,413)	2,247	7,113	9,360
Interest income, net	731	131	862	776	135	911
Other expense, net	(1,391)	—	(1,391)	(5,580)	—	(5,580)
Income before provision (benefit) for income taxes	37,100	49,135	86,235	35,202	20,133	55,335
Provision (benefit) for income taxes	4,166	(16,479)	(12,313)	8,216	2,104	10,320
Net income	\$32,934	\$ 65,614	\$98,548	\$26,986	\$ 18,029	\$45,015
Earnings per share:						
Basic	\$0.43		\$1.27	\$0.35		\$0.59
Diluted	\$0.40		\$1.19	\$0.34		\$0.56
Weighted-average number of common shares outstanding:						
Basic	77,431		77,431	76,343		76,343
Diluted	82,832		82,832	79,732		79,732

Adoption of ASC 606 and ASC 340-40 did not change the Company's total cash provided by or used in operating, financing, or investing activities in the Company's consolidated statements of cash flows for 2017 or 2016.

The Company recorded a cumulative-effect adjustment, as of January 1, 2016, to increase retained earnings by \$204.1 million due to the adoption of ASC 606 and ASC 340-40

Accounting standards not yet adopted

Standard	Description	Effective Date
ASU No. 2016-02, "Leases (Topic 842)"	<p>This standard requires lessees to record most leases on their balance sheets. A modified retrospective transition approach is required, applying the new standard to all leases existing at the date of initial application. An entity may choose to use either: (1) its effective date or (2) the beginning of the earliest comparative period presented in the financial statements as its date of initial application.</p> <p>The Company implemented a new lease management system, which included an assessment of the impact of the new guidance on the Company's financial position and results of operation. The Company will use the effective date as the date of initial application. As part of adoption the Company does not expect to utilize the hindsight practical expedient but does expect to utilize the package of transition practical expedients available under the standard to not:</p> <ol style="list-style-type: none"> 1. Reassess whether any expired or existing contracts are or contain leases. 2. Reassess the lease classification for any expired or existing leases (that is, all existing leases that were classified as operating leases in accordance with Topic 840 will be classified as operating leases, and all existing leases that were classified as capital leases in accordance with Topic 840 will be classified as finance leases). 3. Reassess initial direct costs for any existing leases. <p>On adoption, the Company expects to recognize additional operating liabilities for the Company's existing operating leases, principally composed of office leases, that are currently not recognized on the Company's consolidated balance sheets with a corresponding right of use assets based on the present value of the remaining minimum rental payments under current leasing standards for existing operating leases. The Company does not expect a material impact to its results of operations from adoption. This standard requires the measurement and recognition of expected credit losses for financial assets measured at amortized cost, including trade accounts receivable, upon initial recognition of that financial asset using a forward-looking expected loss model, rather than an incurred loss model for credit losses. Credit losses relating to available-for-sale debt securities should be recorded through an allowance for credit losses when the fair value is below the amortized cost of the asset, removing the concept of "other-than-temporary" impairments.</p>	January 1, 2019
ASU No. 2016-13, "Financial Instruments—Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments"	<p>The Company is currently evaluating the effect this ASU will have on its consolidated financial statements and related disclosures.</p>	January 1, 2020 ⁽¹⁾

⁽¹⁾ Early adoption is permitted

3. MARKETABLE SECURITIES

December 31, 2018

(in thousands)	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
Municipal bonds	\$44,802	\$ 13	\$ (110)	\$44,705

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Corporate bonds	48,499	23	(226)	48,296
	\$93,301	\$ 36	\$ (336)	\$93,001
	December 31, 2017				

(in thousands)	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
Municipal bonds	\$32,996	\$ —	\$ (148) \$32,848
Corporate bonds	28,757	1	(137) 28,621
	\$61,753	\$ 1	\$ (285) \$61,469

As of December 31, 2018, the Company did not hold any investments with unrealized losses considered to be other than temporary.

As of December 31, 2018, remaining maturities of marketable debt securities ranged from January 2019 to August 2021, with a weighted-average remaining maturity of approximately 1.4 years.

4. RECEIVABLES, CONTRACT ASSETS, AND DEFERRED REVENUE

Receivables

(in thousands)	December 31, December 31,	
	2018	2017
Accounts receivable	\$ 180,872	\$ 222,735
Unbilled receivables	172,656	160,084
Long-term unbilled receivables	151,237	160,708
	\$ 504,765	\$ 543,527

Unbilled receivables are the amounts due from clients where the only condition to the right of payment is the passage of time. As of December 31, 2018 and 2017, the allowance for doubtful accounts was not material.

Unbilled receivables are expected to be billed in the future as follows:

(Dollars in thousands)	December 31,	
	2018	
1 Year or less	\$ 172,656	54 %
1-2 Years	95,013	29 %
2-5 Years	56,224	17 %
	\$ 323,893	100 %

Contract assets and deferred revenue

(in thousands)	December 31, December 31,	
	2018	2017
Contract assets ⁽¹⁾	\$ 3,711	\$ 914
Long-term contract assets ⁽²⁾	2,543	—
	\$ 6,254	\$ 914
Deferred revenue	\$ 185,145	\$ 165,850
Long-term deferred revenue ⁽³⁾	5,344	3,706
	\$ 190,489	\$ 169,556

⁽¹⁾ Included in other current assets.

⁽²⁾ Included in other long-term assets.

⁽³⁾ Included in other long-term liabilities.

Contract assets occur when revenue recognized exceeds the amount billed to the client and the right to payment is subject to conditions other than the passage of time, such as the completion of a related performance obligation.

Deferred revenue consists of billings and payments received in advance of revenue recognition. Contract assets and deferred revenue are netted at the contract level for each reporting period. There were no material impairments of contract assets for 2018, 2017, or 2016.

The change in deferred revenue in 2018 was primarily due to new billings in advance of revenue recognition, partially offset by \$237.5 million of revenue recognized, excluding the impact of netting contract assets and deferred revenue at the contract level, during the period that was included in deferred revenue at December 31, 2017.

Major clients

No client represented 10% or more of the Company's total accounts receivable and unbilled receivables as of December 31, 2018 or December 31, 2017.

5. DEFERRED CONTRACT COSTS

(in thousands)	December 31,	
	2018	2017
Deferred contract costs ⁽¹⁾⁽²⁾	\$ 64,367	\$ 37,924

⁽¹⁾ Included in other long-term assets.

⁽²⁾ The increase in deferred contract costs is primarily due to revenue shift in favor of the Company's cloud offerings, which results in a greater portion of contract costs being deferred than for license arrangements.

Amortization of deferred contract costs was as follows:

(in thousands)	2018	2017	2016
Amortization of deferred contract costs ⁽¹⁾	\$ 17,271	\$ 12,106	\$ 11,574

(1) Included in selling and marketing expenses.

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6. PROPERTY AND EQUIPMENT

(in thousands)	December 31,	
	2018	2017
Leasehold improvements	\$39,216	\$38,650
Computer equipment	25,285	23,783
Furniture and fixtures	8,517	8,517
Computer software purchased	7,578	6,690
Computer software developed for internal use	16,463	12,596
Fixed assets in progress	1,173	2,167
	98,232	92,403
Less: accumulated depreciation	(61,597)	(52,044)
	\$36,635	\$40,359

Depreciation expense was approximately \$13.9 million, \$12.4 million, and \$11.2 million for 2018, 2017, and 2016, respectively.

7. GOODWILL AND OTHER INTANGIBLE ASSETS

Goodwill

The following table presents the changes in the carrying amount of goodwill:

(in thousands)	2018	2017
Balance as of January 1,	\$72,952	\$73,164
Purchase price adjustments to goodwill	—	(354)
Translation adjustments	(94)	142
Balance as of December 31,	\$72,858	\$72,952

As discussed in "Note 8. Segment Information" the Company operates in one operating segment and has one reporting unit.

Intangibles

Intangible assets are recorded at cost and amortized using the straight-line method over their estimated useful lives as follows:

(in thousands)	Useful Lives	December 31, 2018		
		Cost	Accumulated Amortization	Net Book Value ⁽¹⁾
Client-related intangibles	4-10 years	\$63,115	\$ (51,224)	\$ 11,891
Technology	2-10 years	59,742	(50,398)	9,344
Other	1 - 5 years	5,361	(5,361)	—
		\$128,218	\$ (106,983)	\$ 21,235

⁽¹⁾ Included in other long-term assets.

(in thousands)	Useful Lives	December 31, 2017		
		Cost	Accumulated Amortization	Net Book Value ⁽¹⁾
Client-related intangibles	4-10 years	\$63,164	\$ (44,835)	\$ 18,329
Technology	3-10 years	58,942	(45,372)	13,570
Other	1 - 5 years	5,361	(5,361)	—
		\$127,467	\$ (95,568)	\$ 31,899

⁽¹⁾ Included in other long-term assets.

Intangibles amortization was reflected in the Company's consolidated statements of operations as follows:

(in thousands)	2018	2017	2016
Cost of revenue	\$5,027	\$5,103	\$5,986
Selling and marketing	6,416	7,235	7,145
General and administrative	—	—	277
	\$11,443	\$12,338	\$13,408

Future estimated amortization expense related to intangible assets:

(in thousands)	December 31, 2018
2019	\$ 5,946
2020	2,950
2021	2,627
2022	2,537
2023 and thereafter	7,175
	\$ 21,235

8. SEGMENT INFORMATION

Operating segments are defined as components of an enterprise about which separate financial information is available that is evaluated regularly by the chief operating decision maker ("CODM") in deciding how to allocate resources and in assessing performance.

The Company derives substantially all of its revenue from the sale and support of one group of similar products and services – software that provides case management, business process management, and real-time decisioning solutions to improve customer engagement and operational excellence in the enterprise applications market. To assess performance, the Company's CODM, who is the chief executive officer, reviews financial information on a consolidated basis. Therefore, the Company determined it has one operating segment and one reporting unit. Long-lived assets related to the Company's U.S. and international operations were:

(Dollars in thousands)	December 31,	
	2018	2017
U.S.	\$26,392 72 %	\$27,590 68 %
India	3,843 10 %	6,703 17 %
International, other	6,400 18 %	6,066 15 %
	\$36,635 100%	\$40,359 100%

9. ACCRUED EXPENSES

(in thousands)	December 31,	
	2018	2017
Outside professional services	\$10,367	\$14,468
Income and other taxes	10,387	7,420
Marketing and sales program expenses	5,860	6,444
Dividends payable	2,363	2,344
Employee-related expenses	3,536	4,065
Other	12,993	10,767
	\$45,506	\$45,508

10. STOCKHOLDERS' EQUITY

Preferred stock

The Company has 1 million authorized shares of preferred stock. The Board of Directors has the authority to issue the shares of preferred stock in one or more series, to establish the number of shares to be included in each series, and to determine the designation, powers, preferences, and rights of the shares of each series and the qualifications, limitations, or restrictions thereof, without any further vote or action by the stockholders. The issuance of preferred stock could decrease the amount of earnings and assets available for distribution to holders of common stock, and may have the effect of delaying, deferring, or defeating a change in control of the Company. The Company had not issued any shares of preferred stock through December 31, 2018.

Common stock

The Company has 200 million authorized shares of common stock, \$0.01 par value per share, of which 78.5 million shares were issued and outstanding at December 31, 2018.

Dividends declared

(per share)	2018	2017	2016
Dividends Declared	\$0.12	\$0.12	\$0.12

Dividend payments

(in thousands)	2018	2017	2016
Dividend payments to shareholders	\$9,432	\$9,277	\$9,174

It is the Company's current intention to pay a quarterly cash dividend of \$0.03 per share, however, the Board of Directors may terminate or modify this dividend program at any time without prior notice.

Stock repurchases

(in thousands)	2018	2017	2016
	Shares	Shares	Shares
Authorization remaining, beginning of period	\$34,892	\$39,385	\$40,534
Authorizations	\$27,003	\$—	\$25,879
Repurchases paid	980 (\$54,276)	96 (\$4,335)	1,078 (\$27,028)
Repurchases unsettled	21 (\$999)	3 (\$158)	—
Authorization remaining, end of period	\$6,620	\$34,892	\$39,385

On June 21, 2018, the Company announced that its Board of Directors extended the expiration date of the current stock repurchase program to June 30, 2019 and increased the amount of common stock the Company is authorized to repurchase to \$50 million between June 15, 2018 and June 30, 2019 (the "Current Program"). Under the Current Program, purchases may be made from time to time on the open market or in privately negotiated transactions. Shares may be repurchased in such amounts as market conditions warrant, subject to regulatory and other considerations. The Company has established a pre-arranged stock repurchase plan, intended to comply with the requirements of Rule 10b5-1 under the Exchange Act, and Rule 10b-18 under the Exchange Act (the "10b5-1 Plan"). All stock repurchases under the Current Program during closed trading window periods will be made pursuant to the 10b5-1 Plan.

11. FAIR VALUE MEASUREMENTS

Assets and liabilities measured at fair value on a recurring basis

The Company records its cash equivalents, marketable securities, and investments in privately-held companies at fair value on a recurring basis. Fair value is an exit price, representing the amount that would be received from the sale of an asset or paid to transfer a liability in an orderly transaction between market participants based on assumptions that market participants would use in pricing an asset or liability.

As a basis for classifying the fair value measurements, a three-tier fair value hierarchy, which classifies the fair value measurements based on the inputs used in measuring fair value, was established as follows:

Level 1 - observable inputs such as quoted prices in active markets for identical assets or liabilities;

Level 2 - significant other inputs that are observable either directly or indirectly; and

Level 3 - significant unobservable inputs on which there is little or no market data, which require the Company to develop its own assumptions. This hierarchy requires the Company to use observable market data, when available, and to minimize the use of unobservable inputs when determining fair value.

The Company's cash equivalents are composed of money market funds and time deposits, which are classified within Level 1 and Level 2, respectively, in the fair value hierarchy. The Company's marketable securities, which are classified within Level 2 of the fair value hierarchy, are valued based on a market approach using quoted prices, when available, or matrix pricing compiled by third party pricing vendors, using observable market inputs such as interest rates, yield curves, and credit risk. The Company's investments in privately-held companies are classified within Level 3 of the fair value hierarchy and are valued using model-based techniques, including option pricing models and discounted cash flow models.

If applicable, the Company will recognize transfers into and out of levels within the fair value hierarchy at the end of the reporting period in which the actual event or change in circumstance occurs. There were no transfers between levels during 2018, 2017, or 2016.

The Company's assets and liabilities measured at fair value on a recurring basis were:

	December 31, 2018			
(in thousands)	Level 1	Level 2	Level 3	Total
Cash equivalents	\$ 10,155	\$ 10,000	\$—	\$ 20,155
Marketable securities:				
Municipal bonds	\$—	\$ 44,705	\$—	\$ 44,705
Corporate bonds	—	48,296	—	48,296
Total marketable securities	\$—	\$ 93,001	\$—	\$ 93,001
Investments in privately-held companies ⁽¹⁾	\$—	\$—	\$ 3,390	\$ 3,390

⁽¹⁾ Included in other long-term assets.

	December 31, 2017			
(in thousands)	Level 1	Level 2	Level 3	Total
Cash equivalents	\$ 2,720	\$ 40,051	\$—	\$ 42,771
Marketable securities:				
Municipal bonds	\$—	\$ 32,848	\$—	\$ 32,848
Corporate bonds	—	28,621	—	28,621
Total marketable securities	\$—	\$ 61,469	\$—	\$ 61,469
Investments in privately-held companies ⁽¹⁾	\$—	\$—	\$ 1,030	\$ 1,030

⁽¹⁾ Included in other long-term assets.

For certain other financial instruments, including accounts receivable, unbilled receivables, and accounts payable, the carrying value approximates fair value due to the relatively short maturity of these items.

Assets measured at fair value on a nonrecurring basis

Assets recorded at fair value on a nonrecurring basis, including property and equipment and intangible assets, are recognized at fair value when they are impaired. The Company did not recognize any impairments on its assets measured at fair value on a nonrecurring basis during 2018, 2017, or 2016.

Credit risk

In addition to receivables, the Company is potentially subject to concentrations of credit risk from the Company's cash, cash equivalents, and marketable securities. The Company's cash and cash equivalents are generally held with large, diverse financial institutions worldwide to reduce the credit risk exposure. Investment policies have been implemented that limit purchases of marketable debt securities to investment-grade securities.

12. REVENUE

Revenue streams

(in thousands)	2018	2017	2016
Perpetual license	\$ 109,863	\$ 132,883	\$ 145,053
Term license	178,256	206,411	152,231
Revenue recognized at a point in time	288,119	339,294	297,284
Maintenance	263,875	242,320	218,635
Cloud	82,627	51,097	40,647
Consulting	256,960	255,756	205,663
Revenue recognized over time	603,462	549,173	464,945
Total revenue	\$ 891,581	\$ 888,467	\$ 762,229

(in thousands)	2018	2017	2016
Term license	\$178,256	\$206,411	\$152,231
Cloud	82,627	51,097	40,647
Maintenance	263,875	242,320	218,635
Subscription ⁽¹⁾	524,758	499,828	411,513
Perpetual license	109,863	132,883	145,053
Consulting	256,960	255,756	205,663
Total revenue	\$891,581	\$888,467	\$762,229

⁽¹⁾ Subscription revenue reflects client arrangements (term license, cloud, and maintenance) which are subject to renewal.

There were no material changes in the Company's estimate of variable fees during 2018, 2017, or 2016. During 2018, 2017, and 2016, revenue recognized related to performance obligations delivered in previous periods was not material.

Geographic revenue

(Dollars in thousands)	2018		2017		2016	
U.S.	\$469,987	52 %	\$505,415	56 %	\$447,673	59 %
Other Americas	53,239	6 %	41,467	5 %	41,607	5 %
U.K.	95,628	11 %	97,000	11 %	98,624	13 %
Other EMEA ⁽¹⁾	147,248	17 %	138,752	16 %	97,113	13 %
Asia-Pacific	125,479	14 %	105,833	12 %	77,212	10 %
Total revenue	\$891,581	100%	\$888,467	100%	\$762,229	100%

⁽¹⁾ Includes Europe (excluding the U.K.), the Middle East, and Africa.

Remaining performance obligations

Revenue for the remaining performance obligations on existing contracts is expected to be recognized as follows:

	December 31, 2018						
(Dollars in thousands)	Perpetual license	Term license	Maintenance	Cloud	Consulting	Total	
1 year or less	\$14,665	\$72,378	\$192,274	\$103,354	\$17,235	\$399,906	63 %
1-2 years	2,343	10,355	10,436	80,214	2,810	106,158	17 %
2-3 years	1,661	1,414	3,644	61,906	940	69,565	11 %
Greater than 3 years	—	233	1,560	53,343	208	55,344	9 %
	\$18,669	\$84,380	\$207,914	\$298,817	\$21,193	\$630,973	100%

Major clients

Clients accounting for 10% or more of the Company's total revenue were:

(Dollars in thousands)	2018	2017	2016
Total revenue	\$891,581	\$888,467	\$762,229
Client A	*	10 %	* %

*Client accounted for less than 10% of total revenue.

13. STOCK-BASED COMPENSATION

The following table presents the stock-based compensation expense included in the Company's consolidated statements of operations:

(in thousands)	2018	2017	2016
Cost of revenues	\$16,862	\$14,573	\$11,459
Selling and marketing	23,237	15,720	12,464
Research and development	15,274	13,618	10,043
General and administrative	8,489	9,402	6,513
Acquisition-related	—	—	342
	\$63,862	\$53,313	\$40,821
Income tax benefit	\$(13,383)	\$(12,113)	\$(12,198)

The Company periodically grants stock options and restricted stock units ("RSUs") for a fixed number of shares upon vesting to

employees and non-employee Directors.

Most of the Company's stock-based compensation arrangements generally vest over five years with 20% vesting after one year and the remaining 80% vesting in equal quarterly installments over the remaining four years. The Company's stock options have a ten-year term. The Company recognizes stock-based compensation using the accelerated attribution method, treating each vesting tranche as if it were an individual grant. The amount of stock-based compensation recognized during a period is based on the value of the awards that are ultimately expected to vest. Forfeitures are estimated at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures differ from those estimates. Ultimately, the Company recognizes the actual expense over the vesting period only for the shares that vest.

Employees may elect to receive 50% of their target incentive compensation under the Company's Corporate Incentive Compensation Plan (the "CICP") in the form of RSUs instead of cash. If elected by an employee, the equity amount is equal in value on the date of grant to 50% of his or her target incentive opportunity, based on the employee's base salary. The number of RSUs granted is determined by dividing 50% of the employee's target incentive opportunity by 85% of the closing price of its common stock on the grant date, less the present value of expected dividends during the vesting period. If elected, the award vests 100% on the CICP payout date of the following year for all participants. Vesting is conditioned upon the performance conditions of the CICP and on continued employment; if threshold funding does not occur, the RSUs will not vest. The Company considers vesting to be probable on the grant date and recognizes the associated stock-based compensation expense over the requisite service period beginning, on the grant date and ending on the vesting date.

The Company grants awards that allow for the settlement of vested stock options and RSUs on a net share basis ("net settled awards"). With net settled awards, the employee does not surrender any cash or shares upon exercise. Rather, the Company withholds the number of shares to cover the exercise price (in the case of stock options) and the minimum statutory tax withholding obligations (in the case of stock options and RSUs) from the shares that would otherwise be issued upon exercise or settlement. The exercise of stock options and settlement of RSUs on a net share basis results in fewer shares issued by the Company.

Share-based compensation plans:

2004 Long-Term Incentive Plan (as amended and restated)

In 2004, the Company adopted the 2004 Long-Term Incentive Plan (as amended and restated, the "2004 Plan") to provide employees, non-employee Directors, and consultants with opportunities to purchase stock through incentive stock options and non-qualified stock options. Subsequent amendments to the plan increased the number of shares authorized for issuance under the plan to 30 million, extended the term of the plan to 2026, and limited annual compensation to any non-employee Director to \$0.5 million.

As of December 31, 2018, approximately 9.6 million shares were subject to outstanding options and stock-based awards under the 2004 Plan.

2006 Employee Stock Purchase Plan

In 2006, the Company adopted the 2006 Employee Stock Purchase Plan (the "2006 ESPP") pursuant to which the Company's employees are entitled to purchase up to an aggregate of 1 million shares of common stock, at a price equal to at least 85% of the fair market value of the Company's common stock on either the commencement date or completion date for offerings under the plan, whichever is less, or such higher price as the Company's Board of Directors may establish from time to time. Until the Company's Board of Directors determines otherwise, the Board has set the purchase price at 95% of the fair market value on the completion date of the offering period. As a result, the 2006 ESPP is non-compensatory and is tax qualified. Therefore, as of December 31, 2018, no compensation expense related to shares issued under the plan had been recognized. In October 2012, the Company's Board of Directors amended the term of the 2006 ESPP such that it will continue until there are no shares remaining to be issued under the plan or until the plan is terminated by the Board of Directors, whichever occurs first.

As of December 31, 2018, approximately 0.4 million shares had been issued thereunder.

Shares available for issuance

As of December 31, 2018, there were approximately 8.3 million shares available for issuance for future equity grants under the Company's stock plans, consisting of approximately 7.7 million shares under the 2004 Plan and approximately 0.6 million shares under the 2006 ESPP.

Grant activity

During 2018, the Company issued approximately 1.4 million shares to its employees and directors under the Company's share-based compensation plans.

Stock options

The Company estimates the fair value of stock options using a Black-Scholes option valuation model. Key inputs used to estimate the fair value of stock options include the exercise price of the award, expected term of the option, expected volatility of the Company's common stock over the option's expected term, risk-free interest rate over the option's expected term, and the Company's expected

annual dividend yield. The exercise price for stock options is greater than or equal to the fair market value of the shares at the grant date.

The weighted-average grant-date fair value for stock options granted in 2018, 2017, and 2016, was \$18.03, \$13.79, and \$8.31 per share, respectively.

The weighted-average assumptions used in the Black-Scholes option valuation model are:

	2018	2017	2016
Expected annual volatility ⁽¹⁾	34 %	35 %	40 %
Expected term in years ⁽²⁾	4.5	4.5	4.4
Risk-free interest rate ⁽³⁾	2.6 %	1.9 %	1.2 %
Expected annual dividend yield ⁽⁴⁾	0.4 %	0.5 %	0.6 %

⁽¹⁾ The expected annual volatility for each grant is determined based on the average of historical daily price changes of the Company's common stock over a period which approximates the expected option term.

⁽²⁾ The expected option term for each grant is determined based on the historical exercise behavior of employees and post-vesting employment termination behavior.

⁽³⁾ The risk-free interest rate is based on the yield of U.S. Treasury securities with a maturity that is commensurate with the expected option term at the time of grant.

⁽⁴⁾ The expected annual dividend yield is based on the weighted-average of the dividend yield assumptions used for options granted during the applicable period.

The following table summarizes the combined stock option activity under the Company's stock option plans for 2018:

	Shares (in thousands)	Weighted-average Exercise Price	Weighted-average Term (in years)	Remaining Contractual Value (in thousands)
Options outstanding as of January 1, 2018	7,130	\$ 26.10		
Granted	1,705	58.42		
Exercised	(1,422)	20.88		
Forfeited	(442)	35.50		
Options outstanding as of December 31, 2018	6,971	\$ 34.47		
Vested and expected to vest as of December 31, 2018	5,841	\$ 33.23	7.0	\$ 99,999
Exercisable as of December 31, 2018	2,893	\$ 22.16	5.7	\$ 74,650

The aggregate intrinsic value of stock options exercised (i.e., the difference between the market price at exercise and the price paid by the employee at exercise) in 2018, 2017, and 2016 was \$56.8 million, \$62.6 million, and \$19.9 million, respectively. The aggregate intrinsic value of stock options outstanding and exercisable as of December 31, 2018 is based on the difference between the closing price of the Company's stock of \$47.83 and the exercise price of the applicable stock options.

As of December 31, 2018, the Company had unrecognized stock-based compensation expense related to the unvested portion of stock options of approximately \$21.1 million that is expected to be recognized as expense over a weighted-average period of approximately 2.3 years.

RSUs

RSUs deliver to the recipient a right to receive a specified number of shares of the Company's common stock upon vesting. The Company values its RSUs at the fair value of its common stock on the grant date, which is the closing price of its common stock on the grant date, less the present value of expected dividends during the vesting period, as

the recipient is not entitled to dividends during the requisite service period.

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The weighted-average grant-date fair value for RSUs granted in 2018, 2017, and 2016 was \$58.52, \$46.07, and \$25.54, respectively.

The following table summarizes the combined RSU activity for all grants, including the CICP, under the 2004 Plan for 2018:

	Shares (in thousands)	Weighted- Average Grant-Date Fair Value	Aggregate Intrinsic Value (in thousands)
Nonvested as of January 1, 2018	2,901	\$ 31.97	
Granted	1,212	58.52	
Vested	(1,144)	31.88	
Forfeited	(318)	36.74	
Nonvested as of December 31, 2018	2,651	\$ 43.69	\$ 126,781
Expected to vest as of December 31, 2018	1,938	\$ 44.83	\$ 92,661

The fair value of RSUs vested in 2018, 2017, and 2016 was \$66.5 million, \$59.0 million, and \$29.2 million, respectively. The aggregate intrinsic value of RSUs outstanding and expected to vest as of December 31, 2018 is based on the closing price of the Company's stock of \$47.83 on December 31, 2018.

As of December 31, 2018, the Company had approximately \$42.3 million of unrecognized stock-based compensation expense related to all unvested RSUs that is expected to be recognized as expense over a weighted-average period of approximately 2.1 years.

14. EMPLOYEE BENEFIT PLANS

The Company sponsors defined contribution plans for qualifying employees, including a 401(k) plan in the United States to which the Company makes discretionary matching contributions.

The following expenses related to defined contribution plans were recorded in the Company's consolidated statements of operations:

(in thousands)	2018	2017	2016
U.S. 401(k) Plan	\$5,506	\$5,003	\$4,510
International Plans	11,101	9,096	7,635
	\$16,607	\$14,099	\$12,145

15. INCOME TAXES

The components of (loss) income before (benefit) provision from income taxes are:

(in thousands)	2018	2017	2016
Domestic	\$(27,494)	\$57,493	\$39,559
Foreign	15,951	28,742	15,776
(Loss) income before (benefit) provision from income taxes	\$(11,543)	\$86,235	\$55,335

The components of the provision for income taxes are:

(in thousands)	2018	2017	2016
Current:			
Federal	\$(1,862)	\$(18,109)	\$7,389
State	287	97	3,081
Foreign	10,313	8,479	4,248
Total current provision (benefit)	8,738	(9,533)	14,718
Deferred:			
Federal	(18,939)	(2,049)	(1,125)
State	(3,702)	(214)	(466)
Foreign	(8,257)	(517)	(2,807)
Total deferred benefit	(30,898)	(2,780)	(4,398)
(Benefit) provision from income taxes	\$(22,160)	\$(12,313)	\$10,320

The effective income tax rate differed from the statutory federal income tax rate due to the following ⁽¹⁾:

	2018	2017	2016
Statutory federal income tax rate	21.0 %	35.0 %	35.0 %
Valuation allowance	(4.4)%	0.5 %	0.2 %
Transaction costs	— %	— %	0.7 %
State income taxes, net of federal benefit and tax credits	28.9 %	(0.5)%	2.5 %
Permanent differences	(11.2)%	1.1 %	1.4 %
GILTI, FDII, and BEAT	(3.5)%	— %	— %
Federal research and experimentation credits	60.6 %	(3.9)%	(1.5)%
Tax effects of foreign activities	3.5 %	(0.9)%	(5.6)%
Tax-exempt income	1.2 %	(0.1)%	(0.2)%
Provision to return adjustments	(2.2)%	(2.1)%	— %
Non-deductible compensation	(8.9)%	2.1 %	4.0 %
Expiration of statutes and changes in estimates	4.5 %	0.3 %	(1.2)%
Excess tax benefits related to share-based compensation	117.3 %	(28.4)%	(12.8)%
Domestic Production Activities	— %	— %	(2.0)%
Deferred tax asset adjustment	(14.2)%	(17.9)%	(0.3)%
Other	(0.6)%	0.5 %	(1.5)%
Effective income tax rate	192.0 %	(14.3)%	18.7 %

⁽¹⁾ In periods of loss before incomes taxes, income tax benefits are reflected as a positive in this table.

Tax Reform Act

On December 22, 2017, the President of the United States signed into law the Tax Cuts and Jobs Act (the “Tax Reform Act”). The Tax Reform Act makes significant changes in the U.S. tax code including the following:

• reduction of the corporate federal income tax rate from 35% to 21%;

• repeal of the domestic manufacturing deduction;

• repeal of the corporate alternative minimum tax;

• a one-time transition tax on accumulated foreign earnings (if any);

• a move to a territorial tax system; and

• acceleration of business asset expensing.

The Tax Reform Act provided for a one-time deemed mandatory repatriation of post-1986 undistributed foreign subsidiary earnings and profits through December 31, 2017. The Company has concluded that it is not be subject to the one-time transition tax due to our foreign subsidiaries being in a net accumulated deficit position.

The Company completed its accounting for the tax effects of enactment of the Tax Reform Act recording a final net benefit amount of \$14.2 million pertaining to the enactment of the Tax Reform Act and the impact of the reduction of the tax rates on our deferred tax attributes; all of which was recorded in 2017 as a component of tax expense.

Beginning in 2018, the Company was subject to immaterial incremental U.S. tax resulting from global intangible low taxed income (“GILTI”) inclusions. Companies must make an accounting policy election to either recognize deferred taxes for temporary basis differences expected to reverse as GILTI in future years or to provide for the tax expense related to GILTI in the year the tax is incurred as a period expense only. The Company has elected to account for GILTI in the year the tax is incurred as a period cost.

Deferred income taxes

Significant components of net deferred tax assets and liabilities are:

	December 31,	
(in thousands)	2018	2017
Deferred tax assets:		
Net operating loss carryforwards	\$40,736	\$52,311
Accruals and reserves	17,576	14,668
Software revenue	—	—
Depreciation	2,874	2,558
Tax credit carryforwards	14,896	13,056
Other	176	52
Total deferred tax assets	76,258	82,645
Valuation allowances	(27,954)	(27,994)
Total net deferred tax assets	48,304	54,651
Deferred tax liabilities:		
Software revenue	(36,510)	(70,347)
Intangibles	(5,748)	(8,527)
Total deferred tax liabilities	(42,258)	(78,874)
Deferred income taxes	\$6,046	\$(24,223)

The Company regularly assesses the need for a valuation allowance against its deferred tax assets. In making that assessment, the Company considers both positive and negative evidence related to the likelihood of realization of the deferred tax assets to determine, based on the weight of available evidence, whether it is more-likely-than-not that some or all of the deferred tax assets will not be realized. This determination requires significant judgment, including assumptions about future taxable income that are based on historical and projected information. In 2018, there was no material change in the valuation allowance.

At December 31, 2018 the Company's net operating losses and credit carryforwards are:

(in thousands)	Federal	State
Net operating losses ⁽¹⁾	\$81,206	\$2,210
Net operating losses due to acquisitions	\$81,206	\$665
Credit carryforwards ⁽²⁾	\$7,480	\$1,937
Credit carryforwards due to acquisitions	\$640	\$324

⁽¹⁾ Excludes federal and state net operating losses of \$60.2 million and \$0.8 million, respectively, and federal and state tax credits of \$0.1 million and \$7.4 million, respectively, that the Company expects will expire unutilized,

⁽²⁾ Carryforward losses and credits expire between 2019 and 2037 except for \$0.9 million of state credits that have an unlimited carryforward period.

At December 31, 2018, the Company had foreign net operating losses of \$46.1 million, all of which the Company expects will expire unutilized.

The Company's India subsidiary is a development center in an area designated as a Special Economic Zone ("SEZ") and is entitled to a tax holiday in India. The tax holiday reduces or eliminates income tax in India. The tax holiday in the Hyderabad SEZ expired in March of 2018 and the tax holiday in the Bangalore SEZ is scheduled to expire in 2022. For 2017 and 2016, the effect of the income tax holiday was to reduce the Company's provision for income taxes by approximately \$1.3 million, and \$1 million, respectively.

Uncertain tax benefits and other considerations

A rollforward of the Company's gross unrecognized tax benefits is:

(in thousands)	2018	2017	2016
Balance as of January 1,	\$19,150	\$22,671	\$23,972
Additions based on tax positions related to the current year	978	452	80
Additions for tax positions of prior years	174	238	110
Additions for acquired uncertain tax benefits	—	—	387
Reductions for change in U.S. federal tax rate	—	(2,424)	—
Reductions for tax positions of prior years	(2,145)	(1,500)	(1,541)
Reductions for a lapse of the applicable statute of limitations	—	(287)	(337)
Balance as of December 31,	\$18,157	\$19,150	\$22,671

As of December 31, 2018, the Company had approximately \$18.2 million of total unrecognized tax benefits, which would decrease the Company's effective tax rate if recognized. The \$2.1 million reduction for tax positions of prior years primarily relate to the settlement of a foreign uncertain tax position. The Company expects that the changes in the unrecognized benefits within the next twelve months will be approximately \$0.5 million due to a lapse of applicable statute of limitations.

The Company files income tax returns in the U.S. and in foreign jurisdictions. The Company has no tax returns under examination by the Internal Revenue Service or state taxing authorities as of December 31, 2018. However, certain foreign jurisdictions are auditing the Company's income tax returns for periods ranging from 2010 through 2014. The Company does not expect the results of these audits to have a material effect on the Company's financial condition, results of operations, or cash flows. With few exceptions, the statute of limitations remains open in all jurisdictions for the tax years 2014 to the present.

16. EARNINGS PER SHARE

Basic earnings per share is computed using the weighted-average number of common shares outstanding during the applicable period. Diluted earnings per share is computed using the weighted-average number of common shares outstanding during the applicable period, plus the dilutive effect of outstanding stock options and RSUs, using the treasury stock method. In periods of loss, all stock options and RSUs are excluded from the weighted-average number of common shares, as their inclusion would be anti-dilutive.

(in thousands, except per share amounts)	2018	2017	2016
Basic			
Net income	\$10,617	\$98,548	\$45,015
Weighted-average common shares outstanding	78,564	77,431	76,343
Earnings per share, basic	\$0.14	\$1.27	\$0.59
Diluted			
Net income	\$10,617	\$98,548	\$45,015
Weighted-average effect of dilutive securities:			
Stock options	2,891	3,471	2,025
RSUs	1,609	1,930	1,364
Effect of dilutive securities	4,500	5,401	3,389
Weighted-average common shares outstanding, assuming dilution	83,064	82,832	79,732
Earnings per share, diluted	\$0.13	\$1.19	\$0.56

Outstanding anti-dilutive stock options and RSUs ⁽¹⁾ 188 221 322

⁽¹⁾ Certain outstanding stock options and RSUs were excluded from the computation of diluted earnings per share because they were anti-dilutive in the period presented. These awards may be dilutive in the future.

17. SELECTED QUARTERLY INFORMATION (UNAUDITED)

	2018			
(in thousands, except per share amounts)	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Revenue	\$235,182	\$196,779	\$203,263	\$256,357
Gross profit	\$159,568	\$122,962	\$128,840	\$178,446
Income (loss) from operations	\$7,936	\$(23,163)	\$(17,258)	\$15,453
Net income (loss)	\$12,200	\$(10,409)	\$(7,587)	\$16,413
Earnings (loss) per share:				
Basic	\$0.16	\$(0.13)	\$(0.10)	\$0.21
Diluted	\$0.15	\$(0.13)	\$(0.10)	\$0.20
	2017			
(in thousands, except per share amounts)	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Revenue	\$256,309	\$186,596	\$190,957	\$254,605
Gross profit	\$188,219	\$118,721	\$121,226	\$180,628
Income (loss) from operations	\$65,907	\$(8,947)	\$(2,301)	\$38,518
Net income	\$52,963	\$3,702	\$1,288	\$40,595
Earnings per share:				
Basic	\$0.69	\$0.05	\$0.01	\$0.52
Diluted	\$0.65	\$0.04	\$0.01	\$0.49

18. ACQUISITIONS

On April 11, 2016, the Company acquired OpenSpan, Inc., a privately held software provider of robotic process automation and workforce analytics software for \$48.8 million in cash, net of \$1.8 million in cash acquired.

19. COMMITMENTS AND CONTINGENCIES

Commitments

The Company leases space for its offices under noncancellable operating leases that expire at various dates through 2023.

As of December 31, 2018, the Company's future minimum rental payments required under operating leases with noncancellable terms in excess of one year were:

(in thousands)	Operating Leases ⁽¹⁾
2019	\$ 15,993
2020	14,807
2021	13,262
2022	12,279
2023 and thereafter	11,084
	\$ 67,425

⁽¹⁾ Operating leases include future minimum rent payments, net of estimated sublease income for facilities that the Company has vacated pursuant to its restructuring activities.

Rent expense under operating leases is recognized on a straight-line basis to account for scheduled rent increases and landlord tenant allowances. In connection with the Company's amended lease for its corporate headquarters dated November 11, 2014, the Company has a landlord tenant allowance totaling approximately \$9.4 million, all of which was used and reimbursed to the Company as of December 31, 2016 and will be amortized as a reduction to rent expense on a straight-line basis over the term of the lease.

Total rent expense under operating leases was approximately \$14.9 million, \$14.7 million, and \$13.4 million for 2018, 2017 and 2016, respectively.

Contingencies

The Company is a party in various contractual disputes, litigation and potential claims arising in the ordinary course of business. The Company does not believe that the resolution of these matters will have a material adverse effect on its financial position or results of operations.

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

Our management, with the participation of our Chief Executive Officer (“CEO”), and Chief Financial Officer (“CFO”), evaluated the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act) as of December 31, 2018. In designing and evaluating our disclosure controls and procedures, our management recognized that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives, and our management necessarily applied its judgment in evaluating the cost-benefit relationship of possible controls and procedures.

Based on this evaluation, our CEO and CFO concluded that our disclosure controls and procedures were effective as of December 31, 2018.

Management’s report on and changes in internal control over financial reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rules 13a-15(f) and 15d-15(f) under the Securities Exchange Act. Under the supervision and with the participation of our management, including our CEO and CFO, we conducted an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2018 based on the framework in the updated Internal Control — Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (“COSO”) on May 14, 2013.

Based on this evaluation, management has concluded that (i) our internal control over financial reporting was effective as of December 31, 2018 and (ii) no change in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Securities Exchange Act) occurred during the quarter ended December 31, 2018 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting. Deloitte & Touche LLP, our independent registered public accounting firm which also audited our consolidated financial statements, has issued an attestation report on our internal control over financial reporting, which is included in Item 8 “Financial Statements and Supplementary Data”.

ITEM 9B. OTHER INFORMATION

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS, AND CORPORATE GOVERNANCE

Except as set forth below, the information required by this Item is contained in our proxy statement for our 2019 annual stockholders meeting (the “2019 proxy statement”) under the heading “Election of Directors” and is incorporated herein by reference. Information relating to certain filings on Forms 3, 4, and 5 is contained in our 2019 proxy statement under the heading “Section 16(a) Beneficial Ownership Reporting Compliance” and is incorporated herein by reference. Information required by this item pursuant to Items 407(c)(3), 407(d)(4), and 407(d)(5) of Regulation S-K relating to an audit committee financial expert, the identification of the audit committee of our Board of Directors, and procedures of security holders to recommend nominees to our Board of Directors is contained in the 2019 proxy statement under the heading “Corporate Governance” and is incorporated herein by reference.

We have adopted a written code of conduct that applies to our Board of Directors and all of our employees, including our principal executive officer, principal financial officer, principal accounting officer, and persons performing similar functions. A copy of our code of conduct can be found on our website, www.pegacom.com. We intend to satisfy the disclosure requirements under Item 5.05 of Form 8-K and under the applicable the NASDAQ Global Select Market rules by posting such information on our website in accordance with such requirements.

EXECUTIVE OFFICERS

The names of our executive officers and certain information about them are set forth below as of February 1, 2019.

Alan Trefler, age 62, founder of Pegasystems, has served as Chief Executive Officer and Chairman of the Board of Directors since the Company was organized in 1983. Prior to 1983, he managed an electronic funds transfer product for TMI Systems Corporation, a software and services company. Mr. Trefler holds a B.A. degree in economics and computer science from Dartmouth College.

Kenneth Stillwell, age 48, joined Pegasystems in July 2016 as Senior Vice President, Chief Financial Officer and Chief Administrative Officer. Mr. Stillwell previously served as Senior Vice President and Chief Financial Officer of Dynatrace, a leader in digital performance management solutions and Executive Vice President and Chief Financial Officer of SOVOS, a financial compliance SaaS provider. Prior to SOVOS, Mr. Stillwell was at PTC, a publicly traded software provider, where he served as Division CFO. Mr. Stillwell holds a B.S. in business/economics from the University of Pittsburgh and an M.S. in accounting and finance from the University of South Carolina. Mr. Stillwell is a Certified Public Accountant.

Efstathios Kouninis, age 57, joined Pegasystems in April 2008 as Vice President of Finance. The Board of Directors appointed Mr. Kouninis as the Company’s Chief Accounting Officer in May 2008 and Treasurer in January 2014. From February 2006 to April 2008, Mr. Kouninis served as Chief Financial Officer and Treasurer of Tasker Products Corporation, a publicly traded manufacturer of antimicrobial chemicals. From November 2004 to February 2006, Mr. Kouninis served on the Staff of the Division of Corporation Finance of the U. S. Securities and Exchange Commission. Mr. Kouninis holds a B.S. from the University of Massachusetts, a Post Baccalaureate in accounting, and an M.S. in taxation from Bentley College.

Douglas Kra, age 56, joined Pegasystems in November 2004 as Vice President of Global Services. In January 2010, Mr. Kra was promoted to Senior Vice President of Global Services. In July 2014, the Company re-organized its sales and consulting services functions under one responsibility for specific geographic regions, and Mr. Kra was promoted to Senior Vice President of Global Customer Success for international regions. From 2002 to 2004, Mr. Kra served as Vice President at eLoyalty Corp., a consulting company specializing in customer relationship management. From 2000 to 2001, Mr. Kra served as President of Zefer Corp., an internet consulting firm. Prior to Zefer, Mr. Kra spent ten years at Cambridge Technology Partners Inc. in a variety of senior roles. Mr. Kra holds a B.A. in computer science from Brandeis University and an M.B.A. in finance from the New York University Stern School of Business.

Michael Pyle, age 64, joined Pegasystems in 1985 and has served as Senior Vice President of Engineering since August 2000. Including his positions with Pegasystems, Mr. Pyle’s professional background encompasses more than forty years of software development and managerial experience throughout Europe and the U.S. Mr. Pyle completed his B.C.S. specializing in computer science and systems programming at the Civil Service College in London.

Leon Trefler, age 58, joined Pegasystems in April 1998 as an Account Executive for Strategic Business Development. Since then, he has held various senior sales management positions across the Company and in Channel Sales. In 2002, he launched the commercialization of PegaRULES Process Commander, the predecessor to the Pega Platform. From

April 2007 to January 2010, Mr. Trefler served as Vice President of Sales, North America and in January 2010, Mr. Trefler was promoted to Senior Vice President of Sales. In July 2014, the Company re-organized its sales and consulting services functions under one responsibility for specific geographic regions, and Mr. Trefler was promoted to Senior Vice President of Global Customer Success for the Americas. Mr. Trefler holds a B.A. degree from Dartmouth College.

Alan Trefler and Leon Trefler are brothers. There are no other family relationships among any of our executive officers or Directors.

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ITEM 11. EXECUTIVE COMPENSATION

The information required by this item is contained in the 2019 proxy statement under the headings “Director Compensation”, “Compensation Discussion and Analysis”, and “Executive Compensation” and is incorporated herein by reference.

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

Information required by this item with respect to stock ownership of certain beneficial owners and management is contained in the 2019 proxy statement under the heading “Security Ownership of Certain Beneficial Owners and Management” and is incorporated herein by reference.

Equity Compensation Plan Information

The following table provides certain information with respect to our equity compensation plans in effect as of December 31, 2018:

(in thousands, except per share amounts)	Number of Shares of Common Stock to be Issued Upon Exercise of Outstanding Stock Options and Vesting of RSUs ⁽³⁾ ⁽⁴⁾	Weighted-average of Exercise price per Share of Outstanding Stock Options ⁽⁵⁾	Number of Shares of Common Stock Remaining Available for Future Issuance (excluding those in column (a)) ⁽⁶⁾
Equity compensation plans approved by stockholders ⁽¹⁾	9,621	\$ 34.47	8,250
Equity compensation plans not approved by stockholders ⁽²⁾	1	\$ 13.81	—

⁽¹⁾ We currently maintain two equity compensation plans: the 2004 Long-Term Incentive Plan as amended and restated, the (“2004 Plan”) and the 2006 Employee Stock Purchase Plan as amended (“2006 ESPP”). In addition to the issuance of stock options, the 2004 Plan allows for the issuance of stock purchase rights and other stock-based awards, including RSUs. Our stockholders previously approved each of these plans and all amendments that were subject to stockholder approval. See “13. Stock-Based Compensation” in Item 8 of this Annual Report for additional information.

⁽²⁾ These stock options were assumed in connection with our acquisition of Chordiant in 2010 and were originally granted under the Chordiant Software, Inc. 2005 Equity Incentive Plan (“2005 Plan”). No additional awards were or may be granted under the 2005 Plan following the date of acquisition. This plan was not approved by our stockholders since it was adopted on the date of acquisition. In connection with our acquisition of Chordiant, all outstanding equity awards issued under the 2005 Plan with an exercise price of \$3.00, on a post-split basis, or lower were assumed by us and converted into the right to receive 0.13 shares of Pegasystems common stock for every share of Chordiant common stock covered by such awards. All other outstanding equity awards issued under the 2005 Plan were cancelled. The 2005 Plan was approved by Chordiant’s stockholders and provided for the grant of incentive stock options, nonstatutory stock options, stock purchase awards, RSAs, RSUs, and other forms of equity compensation. Awards granted under the 2005 Plan generally expire four to ten years after the grant date and generally become exercisable over a period of two to four years, with either yearly or monthly vesting.

⁽³⁾ The number of shares of common stock issued upon exercise of vested stock options and vesting of RSUs will be less than the 9.6 million shown above because of the “net settlement” feature of most of these stock options and RSUs. This feature enables the Company to withhold shares to cover the cost to exercise stock options and, if applicable, to cover taxes due (in the case of stock options and RSUs) based on the fair value of the shares at the exercise date (in the case of stock options) or vesting date (in the case of RSUs), instead of selling all of the shares on the open market to satisfy these obligations. The settlement of exercised stock options and vested RSUs on a net share basis will result in fewer shares issued by the Company.

⁽⁴⁾ During 2018, stock option and RSU holders net settled stock options and RSUs representing the right to purchase a total of 2.5 million shares, of which only 1.4 million were issued to the stock option and RSU holders, and the balance of the shares were surrendered to the Company to pay for the exercise price (in the case of stock options) and the applicable taxes (in the case of stock options and RSUs).

(5) The weighted-average exercise price does not consider the shares issuable upon vesting of outstanding RSUs, which have no exercise price.

(6) Includes approximately 0.6 million shares remaining available for issuance as of December 31, 2018 under the 2006 ESPP.

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

The information required by this item is contained in the 2019 proxy statement under the headings “Certain Relationships and Related Transactions” and “Determination of Independence” and is incorporated herein by reference.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

The information required by this item is contained in the 2019 proxy statement under the heading “Independent Registered Public Accounting Firm Fees and Services” and is incorporated herein by reference.

PART IV

ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES

(a) The following are filed as part of this Annual Report:

(1) Financial Statements

The following consolidated financial statements are included in Item 8:

Report of Independent Registered Public Accounting Firm	Page <u>32</u>
Consolidated Balance Sheets as of December 31, 2018 and 2017	<u>33</u>
Consolidated Statements of Operations for the years ended December 31, 2018, 2017, and 2016	<u>34</u>
Consolidated Statements of Comprehensive Income for the years ended December 31, 2018, 2017, and 2016	<u>35</u>
Consolidated Statements of Stockholders' Equity for the years ended December 31, 2018, 2017, and 2016	<u>36</u>
Consolidated Statements of Cash Flows for the years ended December 31, 2018, 2017, and 2016	<u>37</u>

(b) Exhibits

Exhibit No.	Description
2.1	<u>Agreement and Plan of Merger, dated as of October 9, 2013, by and among Pegasystems Inc., Aries Merger Sub, Inc., Antenna Software, Inc., and Shareholder Representative Services LLC, solely in its capacity as representative of Stockholders thereunder. (Filed as Exhibit 2.1 to the Registrant's October 11, 2013 Form 8-K and incorporated herein by reference.)</u>
3.1	<u>Restated Articles of Organization of the Registrant and Amendments thereto. (Filed as Exhibit 3.1 to the Registrant's September 30, 2014 Form 10-Q and incorporated herein by reference.)</u>
3.2	<u>Amended and Restated Bylaws of Pegasystems Inc. (Filed as Exhibit 3.2 to the Registrant's September 8, 2017 Form 8-K and incorporated herein by reference.)</u>
4.1	<u>Specimen Certificate Representing the Common Stock. (Filed as Exhibit 4.1 to the Registrant's Registration Statement on Form S-1 (Registration No. 333-03807) or an amendment thereto and incorporated herein by reference.)</u>
+10.1++	<u>2004 Long-Term Incentive Plan (as amended and restated) (Filed as Exhibit 10.1 to the Registrant's December 31, 2017 Form 10-K and incorporated herein by reference)</u>
10.2++	<u>Restricted Stock Unit Sub-Plan of the Registrant's 2004 Long-Term Incentive Plan for French Participants (Filed as Appendix B within the Registrant's 2016 Proxy Statement, filed April 18, 2016 and incorporated herein by reference.)</u>
10.3++	<u>Form of Employee Stock Option Agreement, as amended. (Filed as Exhibit 10.3 to the Registrant's March 31, 2017 Form 10-Q and incorporated herein by reference.)</u>
10.4++	<u>Form of Restricted Stock Unit Agreement, as amended. (Filed as Exhibit 10.4 to the Registrant's March 31, 2017 Form 10-Q and incorporated herein by reference.)</u>
10.5++	<u>Form of Non-Employee Director Stock Option Agreement. (Filed as Exhibit 10.2 to the Registrant's September 30, 2004 Form 10-Q and incorporated herein by reference.)</u>
10.6++	<u>Offer Letter between the Registrant and Douglas I. Kra dated October 19, 2004. (Filed as Exhibit 10.20 to the Registrant's 2004 Form 10-K and incorporated herein by reference.)</u>
10.7	<u>Form of Director Indemnification Agreement. (Filed as Exhibit 99.1 to the Registrant's April 11, 2005 Form 8-K and incorporated herein by reference.)</u>
10.9	<u>Lease Agreement dated June 29, 2011 between Charles Park One, LLC and Pegasystems Inc. for premises at One Charles Park (Filed as Exhibit 99.1 to the Registrant's Form 8-K/A filed on July 6, 2011 and incorporated herein by reference.)</u>
10.10++	<u>2006 Employee Stock Purchase Plan, as amended on October 25, 2012. (Filed as Exhibit 10.24 to the Registrant's 2012 Form 10-K and incorporated herein by reference.)</u>
10.11++	<u>2016 Section 16 Officer/FLT Member Corporate Incentive Compensation Plan. (Filed as Exhibit 99.1 to the Registrant's February 24, 2016 Form 8-K and incorporated herein by reference.)</u>
10.12++	<u>2016 Section 16 Executive Officers Base Salaries and Target Bonus Payments. (Filed as Exhibit 99.1 to the Registrant's March 15, 2016 Form 8-K and incorporated herein by reference.)</u>

- 10.13++ Compensation program for non-employee members of the Registrant's Board of Directors. (Filed as Exhibit 10.1 to the Registrant's June 30, 2014 Form 10-Q and incorporated herein by reference.)
- 10.14++ 2017 Section 16 Officer/FLT Member Corporate Incentive Compensation Plan. (Filed as Exhibit 99.1 to the Registrant's March 8, 2017 Form 8-K and incorporated herein by reference.)
- 10.15++ 2015 Section 16 Executive Officers Base Salaries and Target Bonus Payments. (Filed as Exhibit 99.2 to the Registrant's February 3, 2015 Form 8-K and incorporated herein by reference.)
- 10.16++ Compensation program for non-employee members of the Registrant's Board of Directors, effective August 6, 2015. (Filed as Exhibit 10.1 to the Registrant's September 30, 2015 Form 10-Q and incorporated herein by reference.)
- 10.17 First Amendment to Lease Agreement dated November 11, 2014 between Charles Park One, LLC and Pegasystems Inc. (Filed as Exhibit 10.2 to the Registrant's September 30, 2015 Form 10-Q and incorporated herein by reference.)

Exhibit No.	Description
10.18++	<u>Offer Letter between the Registrant and Kenneth Stillwell dated June 1, 2016. (Filed as Exhibit 99.1 to the Registrant's June 14, 2016 Form 8-K and incorporated herein by reference.)</u>
10.19++	<u>Compensation program for non-employee members of the Registrant's Board of Directors, effective May 18, 2016. (Filed as Exhibit 10.1 to the Registrant's June 30, 2016 Form 10-Q and incorporated herein by reference.)</u>
10.20++	<u>2018 Section 16 Officer/FLT Member Corporate Incentive Compensation Plan. (Filed as Exhibit 99.1 to the Registrant's December 27, 2017 Form 8-K and incorporated herein by reference.)</u>
10.21++	<u>2018 Section 16 Officer/FLT Member Executive Officers Base Salaries and Target Bonus Payments. (Filed as Exhibit 99.1 to the Registrant's March 9, 2018 Form 8-K and incorporated herein by reference.)</u>
10.22++	<u>2019 Section 16 Officer/FLT Member Corporate Incentive Compensation Plan. (Filed as Exhibit 99.1 to the Registrant's February 8, 2019 Form 8-K and incorporated herein by reference.)</u>
+21.1	<u>Subsidiaries of the Registrant.</u>
+23.1	<u>Consent of Independent Registered Public Accounting Firm—Deloitte & Touche LLP.</u>
+31.1	<u>Certification pursuant to Exchange Act Rules 13a-14 and 15d-14 of the Chief Executive Officer.</u>
+31.2	<u>Certification pursuant to Exchange Act Rules 13a-14 and 15d-14 of the Chief Financial Officer.</u>
+32	<u>Certification pursuant to 18 U.S.C. Section 1350 of the Chief Executive Officer and the Chief Financial Officer.</u>
101.INS **	XBRL Instance document.
101.SCH**	XBRL Taxonomy Extension Schema Document.
101.CAL**	XBRL Taxonomy Calculation Linkbase Document.
101.DEF**	XBRL Taxonomy Extension Definition Linkbase Document.
101.LAB**	XBRL Taxonomy Label Linkbase Document.
101.PRE**	XBRL Taxonomy Presentation Linkbase Document.
+ Filed herewith	
++ Management contracts and compensatory plan or arrangements required to be filed pursuant to Item 15(b) of Form 10-K.	
** Submitted electronically herewith	
(c) Financial Statement Schedules	
All financial statement schedules are omitted because the required information is not present or not present in sufficient amounts to require submission of the schedule or because the information is reflected in the consolidated financial statements or notes thereto.	
ITEM 16. FORM 10-K SUMMARY	
Omitted at Registrant's option	

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this Annual Report on Form 10-K to be signed on its behalf by the undersigned, thereunto duly authorized.
Pegasystems Inc.

Date: February 20, 2019 By: /s/ KENNETH STILLWELL

Kenneth Stillwell
Chief Financial Officer and Chief Administrative Officer
(Principal Financial Officer)

Pursuant to the requirements of the Securities Exchange Act of 1934, this Annual Report on Form 10-K has been signed below on February 20, 2019 by the following persons on behalf of the Registrant and in the capacities indicated.

Signature	Title
/s/ ALAN TREFLER Alan Trefler	Chairman and Chief Executive Officer (Principal Executive Officer)
/s/ KENNETH STILLWELL Kenneth Stillwell	Chief Financial Officer and Chief Administrative Officer (Principal Financial Officer)
/s/ EFSTATHIOS KOUNINIS Efsthios Kouninis	Chief Accounting Officer, Vice President of Finance and Treasurer (Principal Accounting Officer)
/s/ PETER GYENES Peter Gyenes	Director
/s/ RONALD HOVSEPIAN Ronald Hovsepian	Director
/s/ RICHARD JONES Richard Jones	Director
/s/ DIANNE LEDINGHAM Dianne Ledingham	Director
/s/ JAMES O'HALLORAN James O'Halloran	Director
/s/ SHARON ROWLANDS Sharon Rowlands	Director
/s/ LARRY WEBER Larry Weber	Director