REALPAGE INC
Form 10-K
February 27, 2019
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

(Mark One)
x ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES AND 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
For the transition period from to
Commission File Number: 001-34846

RealPage, Inc.
(Exact name of registrant as specified in its charter)

Delaware	75-2788861
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

2201 Lakeside Blvd. Richardson, Texas	75082-4305
(Address of principal executive offices)	(Zip Code)

(972) 820-3000
(Registrant’s telephone number, including area code)
Securities registered pursuant to Section 12(b) of the Act:

Common Stock, $0.001 par value	The NASDAQ Stock Market LLC
(Title of class)	(Name of each exchange on which registered)

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 x No ¨

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

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

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes x No ¨

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

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

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

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

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

Based on the closing price of the registrant's common stock on the last business day of the registrant's most recently completed second fiscal quarter, which was June 30, 2018, the aggregate market value of its shares held by non-affiliates on that date was approximately $4,177,183,676. On February 15, 2019, 93,590,150 shares of the registrant's Common Stock, $0.001 par value, were outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Registrant's definitive proxy statement for its 2019 Annual Meeting of Stockholders to be filed within 120 days of the Registrant's fiscal year ended December 31, 2018 are incorporated by reference into Part III of this Annual Report on Form 10-K where indicated.

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SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

We have made forward-looking statements in this Annual Report on Form 10-K that are subject to risks and uncertainties. Forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended, are subject to the “safe harbor” created by those sections. The forward-looking statements in this Annual Report on Form 10-K are based on our management’s beliefs and assumptions and on information currently available to our management. Statements preceded by, followed by, or that otherwise include the words “anticipates,” “aspires,” “believes,” “can,” “continue,” “could,” “estimates,” “expects,” “intends,” “may,” “plans,” “potential,” “predicts,” “projects,” “seeks,” “should,” “will” or “would” or s and the negatives of those terms are generally forward-looking in nature and not historical facts. These forward-looking statements involve known and unknown risks, uncertainties, and other factors, which may cause our actual results, performance, time frames or achievements to be materially different from any future results, performance, time frames or achievements expressed or implied by the forward-looking statements. We discuss many of these risks, uncertainties and other factors in this document in greater detail under the heading “Risk Factors.” We believe it is important to communicate our expectations to our investors. However, there may be events in the future that we are not able to predict accurately or over which we have no control. The risks described in “Risk Factors” included in this Annual Report on Form 10-K, as well as any other cautionary language in this Annual Report on Form 10-K, provide examples of risks, uncertainties and events that may cause our actual results to differ materially from the expectations we describe in our forward-looking statements. Before you invest in our common stock, you should be aware that the occurrence of the events described in “Risk Factors” and elsewhere in this Annual Report on Form 10-K could harm our business.

Given these risks, uncertainties and other factors, you should not place undue reliance on these forward-looking statements. Also, these forward-looking statements represent our estimates and assumptions only as of the date of this Annual Report on Form 10-K. You should read this document completely and with the understanding that our actual future results may be materially different from what we expect. We hereby qualify our forward-looking statements by these cautionary statements. Except as required by law, we assume no obligation to update these forward-looking statements publicly, or to update the reasons actual results could differ materially from those anticipated in these forward-looking statements, even if new information becomes available in the future.

PART I

Item 1. Business.

Company Overview

RealPage, Inc., a Delaware corporation (together with its subsidiaries, the “Company” or “we” or “us”), is a leading global provider of software and data analytics to the real estate industry. Our platform of data analytics and software solutions enables the rental real estate industry to manage property operations (such as marketing, pricing, screening, leasing, and accounting), identify opportunities through market intelligence, and obtain data-driven insight for better operational and financial decision-making. Our integrated, on demand platform provides a single point of access and a massive repository of real-time lease transaction data, including prospect, renter, and property data. By leveraging data as well as integrating and streamlining a wide range of complex processes and interactions among the rental real estate ecosystem (owners, managers, prospects, renters, service providers, and investors), our platform helps our clients improve financial and operational performance and prudently place and harvest capital.

We sell our solutions through our direct sales organization. Our total revenues were approximately $869.5 million, $671.0 million, and $568.1 million for the years ended December 31, 2018, 2017, and 2016, respectively. In the same periods, we had operating income of approximately $66.1 million, $30.0 million, and $31.2 million, respectively, and net income of approximately $34.7 million, $0.4 million, and $16.7 million, respectively.

Our company was formed in 1998 to acquire Rent Roll, Inc., which marketed and sold on premise property management systems for the conventional and affordable multifamily rental housing markets. In June 2001, we released OneSite, our first on demand property management system. Since 2002, we have expanded our platform of solutions to include property management, leasing and marketing, resident services, and asset optimization capabilities. In addition to the multifamily markets, we now serve the single family, senior living, student living, military housing, commercial, hospitality, and vacation rental markets. In addition, since July 2002, we have completed over 40 acquisitions of complementary technologies to supplement our internal product development and sales and marketing efforts and expand the scope of our solutions, the types of rental housing and vacation rental properties served by our solutions, and our client base. In connection with this expansion and these acquisitions, we have committed greater resources to developing and increasing sales of our platform of data analytics and on demand solutions. As part of our strategy, we plan to continue to pursue acquisitions of complementary businesses, products, and technologies.

Industry Overview

The rental real estate market is large, growing, and complex.

The rental real estate market is large and characterized by challenging and location-specific operating requirements, diverse industry participants, significant mobility among renters, and a variety of property types, including single family and a wide range of multifamily property types, including conventional, affordable, privatized military, student, and senior housing. According to the U.S. Census Bureau American Housing Survey for the United States, there were 43.9 million rental real estate units in the United States in 2017. Based on U.S. Census Bureau data and our own estimates, we believe that the overall size of the U.S. rental real estate market, including rent, utilities, and insurance, exceeds $560.0 billion annually. We estimate that the total addressable market for our current data analytics and on demand software solutions is approximately $10.0 billion per year. This estimate assumes that each of the 43.9 million rental units in the United States has the potential to generate annually a range of approximately $180 in revenue per unit for single family units to approximately $350 in revenue per unit for conventional multifamily units. In addition, we estimate that the student and senior markets have the potential to generate annually approximately $460 in revenue per unit, and affordable housing markets will generate annually approximately $150 in revenue per unit. We base this potential revenue assumption on our review of the purchasing patterns of our existing clients with respect to our data analytics and on demand software solutions, the solutions currently utilized by our existing clients, the number of units our clients manage with these solutions, and our current pricing for data analytics and on demand software solutions.

The global vacation rental market is large and generally segmented by the type of property and seasonality. Based on our industry research, we estimate the total global vacation rental market to be approximately $130.0 billion annually. Professional vacation managers, representing roughly 2.0 million units, are responsible for approximately half of the total vacation rental transactions in the market and the other half of the total transactions relate to properties that are individually managed by the property owners. We estimate that the total addressable market for our vacation rental solutions is approximately $1.7 billion per year. This estimate assumes that each of the 2.0 million units managed has the potential to generate annual revenue per unit of $850. We estimate the potential revenue assumptions based on our review of market industry research and realistic solution penetration rates, as well as related trends affecting the vacation rental market, including the analysis of vacancy rates and the average number of nights booked.

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The homeowner association ("HOA") market is estimated to contain over 16.0 million units and we estimate that the total addressable market for our HOA solutions is approximately $1.0 billion per year. This estimate assumes that each of the 16.0 million units managed has the potential to generate annual revenue per unit of $60. We estimate the potential revenue assumptions based on our review of market industry research and realistic solution penetration rates, as well as related trends affecting the HOA market.

We believe there is increasing demand for solutions that bring efficiency and precision to the rental real estate industry, which has historically lacked the tools available to many other investment classes. We leverage our massive pool of lease transaction data to provide our clients with analytical tools and actionable intelligence to inform the prudent allocation of capital. We believe that the use of precision data analytics and price optimization solutions represent a significant opportunity to increase yield from the approximately $3.2 trillion of apartment stock in the U.S., turning over at a rate of approximately $170.0 billion per year.

Rental real estate management spans both the renter life cycle and the operations of a property.

The renter life cycle can be separated into four key stages: prospect, applicant, residency or stay, and post-residency or post-stay. Each stage has unique requirements, and a property owner's or manager's ability to effectively address these requirements can significantly impact revenue and profitability.

In addition to managing the renter life cycle, property owners and managers must also manage the operations of their properties. Critical components of property operations include materials and service provider procurement; insurance and risk mitigation; utility and energy management; yield management; information technology and telecommunications management; accounting; expense tracking and management; document management; security; staff hiring and training; staff performance measurement and management; and marketing.

Managing the renter life cycle and the operations of a property involves several different constituents, including property owners and managers, prospects, renters, service providers, and investors. Property owners can include single-property owners, multi-property owners, national residential apartment syndicates that may own thousands of units through a variety of investment funds, and real estate investment trusts ("REITs"). Property managers often are responsible for a large number of properties that can range from single family units to multifamily apartment communities. Property owners and managers also need to manage a variety of service providers, including utilities, insurance providers, video, voice and data providers, and maintenance and capital goods suppliers. Managing these diverse relationships, combined with renter turnover, property turnover, as well as regulatory and compliance requirements, can make the operations of even a small portfolio of rental properties complex. Challenges are compounded for real estate portfolio managers responsible for a large number of geographically dispersed properties, which require overseeing potentially hundreds of thousands of individual rental processes.

Legacy information technology solutions designed to manage the rental real estate management process are inadequate.

During the 1970's and 1980's, the rental real estate industry was highly fragmented and regionally organized. During this period, the first property management systems and software solutions emerged to help property owners and managers with basic accounting and record keeping functions. These solutions provided limited functionality and scalability and often were not tailored to the specific needs of the rental real estate industry.

Beginning in the mid 1990's, the rental real estate market began to consolidate and large, nationally focused and publicly financed companies emerged, which aggregated significant numbers of units. The rise of national real estate portfolio managers, many of them accountable to public shareholders, created a need for more sophisticated and scalable property management systems that included a centralized database and were designed to optimize and automate multiple business processes within the renter life cycle and property operations. Despite increasing market demands, the available solutions continued to be insufficient to fully address the complex requirements of the rental real estate industry, which moved beyond basic accounting and record keeping functions to also include value-added services, such as Internet marketing, applicant screening, billing solutions and analytics for pricing, and yield optimization. Additionally, the rise of national syndicates and REITs fueled the need for tools that provide increased visibility into the operational performance of portfolio properties and market analysis resources to maximize return on investment.

To address its complex and evolving requirements, the rental real estate industry has historically implemented a myriad of single point solutions; general purpose applications, such as Microsoft Excel; and/or internally developed solutions to manage their properties. These solutions can be expensive to implement and maintain; often lack integrated functionality to help rental real estate owners, managers, and investors maximize operational yields; and do not have dynamic reporting and analysis tools necessary to optimize investment returns or support capital allocation decisions. In addition, many professionals in the rental real estate industry still rely on paper or spreadsheet-based approaches, which are typically time-intensive and prone to human error or internal mismanagement.

The rental real estate industry has relied upon print and Internet listing firms to attract leads required to fill available vacancies.

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We believe these historical solutions are inadequate because they:

- require significant customization to implement, which frequently inhibits upgrading to new versions or platforms in a timely manner;
- require information technology (“IT”) resources to support integration points between property management systems and disparate value-added services;
- require IT resources to implement and maintain data security, data integrity, performance, and business continuity solutions;
- lack scalability and flexibility to account for the expansion or contraction of a property portfolio;
- lack material organic lease generation capability and do not track the cost of leads generated by each source;
- lack effective spend management capabilities for controlling property management costs;
- lack comprehensive analytics for pricing and yield optimization;
- lack workflow level integration;
- do not provide owners, managers, and investors with visibility into overall property performance; and
- cannot be easily updated to meet new regulations and compliance requirements.

On demand software solutions are well suited to meet the rental real estate market’s needs.

The ubiquitous nature of the Internet, widespread broadband adoption, and improved network reliability and security has enabled the deployment and delivery of business-critical applications online. The on demand delivery model is substantially more economical than traditional on premise software solutions that generally have higher deployment and support costs and require the client to purchase and maintain the associated servers, storage, networks, security, and disaster recovery solutions.

The RealPage Solution

We provide a technology platform of data analytics and on demand software solutions that integrates and streamlines rental real estate management and property operations. Our platform provides the analytical and software solutions necessary to optimize operational yields and returns on investment, and contributes to a more efficient property management process and an improved experience for all of the constituents involved in the rental real estate ecosystem.

Benefits to our Clients

We believe the benefits of our solutions for our clients include the following:

Increased revenues: Our data analytics and on demand software solutions enable our clients to increase their revenues and optimize operational yields by improving their sales and marketing effectiveness; pricing and occupancy; and collection of rental payments, utility expenses, late fees, and other charges. Additionally, our solutions enable our clients to realize new sources of revenue from complementary solutions and services.

Reduced operating costs: Our data analytics and on demand software solutions help our clients reduce costs and optimize operational yields by streamlining and automating many ongoing property management functions; centralizing and controlling purchasing by on-site personnel; and transferring costs from the site to more efficient, centrally managed operations. Our on demand delivery model also reduces a rental property’s operating costs by eliminating the need to own and support the applications or associated hardware infrastructure. In addition, our integrated solutions consolidate the initial implementation and training costs and ongoing support associated with multiple applications. This is particularly important for rental real estate professionals who want to reduce enterprise-class IT infrastructure, support, and staff training.

Improved quality of service for renters and prospects: Our solutions improve the level of service that rental real estate properties provide to renters and prospects by enabling certain types of transactions to be completed online; expediting the processing of rental applications, maintenance service requests, and payments; and increasing the frequency and quality of communication with their renters and prospects. This provides higher renter satisfaction and increased differentiation from competing properties that do not use our solutions while optimizing operational yields.

Streamlined and simplified property management business processes: Our platform provides integrated solutions for managing a wide variety of property management processes that have traditionally been managed by separate manual or disaggregated applications. Our on demand software solutions utilize common authentication that enables data sharing and workflow automation of certain business processes, thereby eliminating redundant data entry and simplifying many recurring tasks. The efficiency of our solutions allows for optimization of operational yields.
Greater visibility into real estate investment portfolio: Our portfolio management solutions are designed specifically for general partners, limited partners, property management professionals, and other real estate investment firms. These solutions allow stakeholders to quickly combine financial and operating metrics based upon portfolio attributes to evaluate performance,

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trends, and operations across a portfolio, as well as facilitate the assessment of potential asset management strategies. These solutions provide an unprecedented level of visibility into a real estate portfolio, including information down to the property level, and are designed to work with any property management system. Our portfolio management solutions provide stakeholders the critical information necessary to maximize investment returns and prudently allocate and harvest capital investment.

Ability to integrate third-party products and services: Our open architecture and application framework facilitate the integration of third-party applications and services into our solutions. This enables our clients to conduct these business functions through the same system that they already use for many of their other tasks and to leverage the same repository of lease transaction data, including prospect, renter, and property data, which supports our solutions.

Increased visibility into property performance: Our platform of data analytics and on demand software solutions enable rental real estate owners, managers, and investors to gain a comprehensive view of the operational and financial performance of each of their properties. Our solutions provide a library of standard reports, dashboards, scorecards, and alerts, and we also provide interfaces to several widely used report writers and business intelligence tools. We maintain a massive repository of real-time lease transaction data, subsets of which can be utilized to factor rental payment history into applicant screening processes and to create more accurate supply and demand models and statistically-based price elasticity models to improve price optimization. This enables our clients to optimize both operational yields and investment returns.

Simple implementation and support: Our platform of solutions includes pre-configured extensions that meet the specific needs of a variety of property types and can be easily tailored by our clients to meet more specific requirements of their properties and business processes. We strive to minimize the need for professional consulting services to implement our solutions and train personnel.

Improved scalability: We host our solutions for our clients, thereby reducing or eliminating our clients’ costs associated with expanding or contracting IT infrastructure as their property portfolios evolve. We also bear the risk of technological obsolescence because we own and manage our data center infrastructure and are continually upgrading it to newer generations of technology without incremental cost to our clients.

Competitive Strengths of our Solutions

The competitive strengths of our solutions are as follows:

Integrated on demand software platform based on a repository of real-time lease transaction data: Our solutions are delivered through an integrated on demand software platform that provides a single point of access via the Internet with a common repository of lease transaction data, including prospect, renter, and property data, which permits our solutions to access requested data through offline data transfer or in real-time.

Large and growing apartment real estate ecosystem: At December 31, 2018, our client base of over 12,200 clients used one or more of our integrated data analytics or on demand software solutions to help manage the operations of approximately 16.2 million rental real estate units. Our solutions automate and streamline many of the recurring transactions and interactions among this large and expanding apartment real estate ecosystem, including prospect inquiries, applications, monthly rent payments, and service requests. As the number of constituents of the apartment real estate ecosystem increases, the volume of lease transaction date in our repository and its value to the constituents of the ecosystem grows.

Comprehensive platform of data analytics and on demand software solutions and services for the rental real estate industry: Our platform of solutions and services provides a broad range of analytical and on demand capabilities for managing the renter life cycle and core operational processes for property management. This integrated, on demand platform enables our clients to optimize operational yields and investment returns.

Precision data analytics and price optimization tools based on in-depth lease transaction data: The combination of our massive pool of lease transaction data, our expertise in apartment marketing dynamics, our data science team that can extract actionable insights, and our forecasting abilities creates a unique competitive advantage. Our statistical-based modeling and forecasting solutions provide our clients with granular, market-specific intelligence which facilitates the optimization of operational yields and returns on investment. We believe the use of precision data analytics and price optimization solutions represents a significant opportunity to increase yields from the approximate $3.2 trillion of apartment stock in the U.S., turning over at a rate of $170.0 billion per year.

Open cloud computing architecture: Our cloud computing architecture enables our solutions to interface with our clients' existing systems and allows our clients to outsource the management of third-party business applications. This open architecture enables our clients to buy our solutions incrementally while continuing to use existing third-party solutions, allowing us to shorten sales cycles and increase adoption of our solutions within our target markets.

Deep rental real estate industry expertise: We have been serving the rental real estate industry exclusively for over 20 years, and the members of our senior management team have extensive experience in the rental real estate industry. We

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design our solutions based on our extensive expertise, insight into industry trends and developments, and property management best practices that help our clients simplify the challenges of owning and managing rental properties.

Experienced management team with strong integrating and operating track record: We have a highly seasoned and effective management team with extensive expertise in the rental real estate industry. By leveraging this expertise and knowledge, we have developed, and continue to improve, data analytics and on demand software solutions which help our clients simplify the challenges of owning and managing rental properties, increase operational yields, and make better capital placement and harvesting decisions. Our management team has a proven ability to acquire and integrate complementary businesses and technologies, as demonstrated by the over 40 acquisitions we have completed since July 2002. We continue to attract and retain experienced management talent to support our growth.

Our Strategy

We plan to continue to leverage our platform of solutions and industry presence to maintain our position as a leading provider of technology solutions to the real estate industry. The key elements of our strategy to accomplish this objective are as follows:

Acquire new clients: We intend to actively pursue new client relationships with property management professionals and investors that do not currently use our solutions. In addition to marketing our property management solutions, we will seek to sell our software-enabled, value-added services to clients of other third-party property management systems by utilizing our open architecture to facilitate integration of our solutions with those systems.

Increase the adoption of the RealPage platform: Many of our clients rely on our platform to manage their daily operations and track all of their critical prospect, renter, and property information. Additionally, some of our clients utilize our software-enabled, value-added services to complement third-party Enterprise Resource Planning (“ERP”) systems. We have continually introduced new software-enabled, value-added services to complement our platform of solutions and marketed our on demand solutions to our clients who are utilizing third-party ERP systems. We believe that the penetration of our on demand software solutions to date has been modest, and significant potential exists for additional on demand revenue from sales of these solutions to our client base. We have significant opportunities to further leverage the critical role that our solutions play in our clients’ operations by increasing the adoption of our platform of solutions and value-added services within our existing client base, and we intend to actively focus on up-selling and cross-selling our solutions to our clients.

Add new features and functionality to our rental real estate industry platform: We believe that we offer the most comprehensive platform of data analytics and on demand software solutions for the rental real estate industry. Our platform enables our clients to control many aspects of the residential rental property management process. We are able to add new capabilities that further enhance our platform, and we intend to continue developing and introducing new solutions to sell to both new and existing clients. These solutions may include localized solutions to support our clients as they grow their international operations. We also intend to develop new relationships with third-party application providers that can use our open architecture to offer additional product and service capabilities to their clients through our platform.

Pursue acquisitions of complementary businesses, products, and technologies: Since July 2002, we have completed over 40 acquisitions that have enabled us to expand our platform, enter into new rental property markets, and expand our client base. We intend to continue to pursue acquisitions of complementary businesses, products, and technologies. We continue to selectively evaluate our capital allocation strategy to focus on the most efficient sources of capital available to us for the acquisition of businesses and technologies that may help us accomplish these and other strategic objectives.

Solutions and Services

Our platform is designed to serve as a single system of record for all of the constituents of the rental real estate ecosystem; to support the entire renter life cycle, from prospect to applicant to residency or guest to post-residency or post-stay; and to optimize operational yields and returns on investment. Common authentication, work flow, and user experience across solution categories enables each of these constituents to access different applications as appropriate for their roles.

Our platform consists of four primary categories of solutions: Property Management, Leasing and Marketing, Resident Services, and Asset Optimization. These solutions provide complementary asset performance and investment decision support; risk mitigation, billing and utility management; resident engagement, spend management, operations and facilities management; and lead generation and lease management capabilities that collectively enable our clients to manage all the stages of the renter life cycle. Each of our solution categories includes multiple product centers that provide distinct capabilities that can be bundled as a package or licensed separately. Each product center integrates with a central repository of lease transaction data, including prospect, renter, and property data. In addition, our open architecture allows third-party applications to access our solutions using our RealPage Exchange platform.

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We offer different versions of our platform for different types of properties in different real estate markets. For example, our platform supports the specific and distinct requirements of:

- conventional single family properties;
- conventional multifamily properties;
- affordable Housing and Urban Development ("HUD") properties;
- affordable tax credit properties;
- rural housing properties;
- privatized military housing;
- commercial properties;
- student housing;
- senior living;
- homeowner association properties;
- short term rentals; and
- vacation rentals.

Property Management

Our property management solutions are referred to as ERP systems. These solutions manage core property management business processes, including leasing, accounting, budgeting, purchasing, facilities management, document management, and support and advisory services. The solutions include a central database of prospect, applicant, renter, and property information that is accessible in real time by our other solutions. Our property management solutions also interface with most popular general ledger accounting systems through our RealPage Exchange platform. This makes it possible for clients to deploy our solutions using our accounting system or a third-party accounting system. Our property management solution category consists of these primary solutions: OneSite, Propertyware, RealPage Financial Services, Kigo, Spend Management Solutions, SmartSource IT, and EasyLMS.

OneSite

OneSite is our flagship on demand property management solution for multifamily properties and is tailored to the specific needs of different property types (conventional multifamily, affordable properties, rural housing, privatized military housing, senior living, student living, and commercial). OneSite offers functionality that generates lease documents, manages service requests, measures acuity of senior residents, enables senior community management, and manages procurement activities.

Propertyware

Propertyware is our on demand property management system for single-family properties and small, centrally managed multifamily properties. Propertyware functionality includes accounting, maintenance and work order management, marketing, spend management, and portal services. In addition, we offer our screening and payment solutions through our Propertyware brand to single family and small, centrally managed multifamily properties.

RealPage Financial Services

RealPage Financial Services is an on demand offering of products and services for all back office accounting. The RealPage Financial Suite includes budgeting, property accounting, corporate accounting, job cost, and investment accounting. SmartSource Accounting provides for full outsourcing of back office accounting services.

Kigo

Kigo is our on demand vacation rental property management system. Kigo offers solutions for vacation rental property management that include vacation rental calendars, scheduling, reservations, accounting, channel management, website design, payment processing, and other tasks to aid the management of leads, revenue, resources, and lodging calendars.

Spend Management Solutions

Our spend management solutions enable property owners and managers to better control costs. Spend management functionality includes purchase order automation; automated approval workflows, including mobile approvals; eProcurement solutions and services leveraging our volume to negotiate vendor discounts; budget and spend limit controls; centralized expense reporting; invoice management; bid management for capital projects; and automated vendor compliance tools.

SmartSource IT

SmartSource IT provides outsourced IT management and support services to allow property owners and managers to focus on core competencies and scale operations as portfolios adjust with lower risk and greater flexibility, enhancing end user productivity. SmartSource IT services include end user desktop support for both corporate and property employees, IT purchasing, Office 365 license management, server hosting, and resident technology services. This robust set of IT services reduces IT complexity and lowers the total cost of technology ownership while providing superior security and performance.

EasyLMS

EasyLMS is a learning management system for property management professionals and their staff. EasyLMS substantially reduces training time by compartmentalizing subject matter and disseminating lessons in 10 to 15 minute increments for easier consumption during the workday. The system also incorporates gamification and active engagement to enhance the effectiveness of the learning solution and knowledge retention.

Leasing and Marketing

Leasing and marketing solutions aim to optimize marketing spend and the leasing process. These solutions manage core leasing and marketing processes, including websites and syndication, paid lead generation, organic lead generation, lead management, automated lead closure, lead analytics, real-time unit availability, automated online apartment leasing, applicant screening, and creative content design. Our leasing and marketing solutions category consists of the following primary solutions: Online Leasing, Contact Center, Websites & Syndication, Intelligent Lease Management, LeaseLabs, Lead2Lease CRM, Resident Screening, and MyNewPlace.

Online Leasing

Online Leasing is our on demand leasing platform that transacts the entire leasing process online. Among other functions, the platform utilizes widgets that enable renters to confirm unit availability, generate a price quote, apply for residency, and fully execute a lease.

Contact Center

Contact Center is our 24/7 on demand lead closure and resident maintenance support solution. Contact Center provides both live agent and automated platforms. Communication channels and functionality include call, web chat, email with instant call reply, email for leasing, as well as RealPage Live Agent calls and answer automation for maintenance support. Contact Center is a strategic service partner offering a combination of people, process, and technology to track all leads, schedule visits, and capture emergency and non-emergency maintenance requests on behalf of our clients.

Websites & Syndication

Websites and Syndication anchor our on demand organic lead generation platform. Functionality includes property website design and enhanced search engine optimized ("SEO") content (e.g. high-resolution photography, video tours, animated tours, 3D floor plans, and interactive site maps), mobile applications and integration with online leasing to drive traffic and lead quality. Syndication tools ensure consistency across multiple marketing channels and include classified directory campaign services, renter social referrals, reputation management, surveys, real-time reporting, and enhanced lead management.

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Intelligent Lease Management (“ILM”)

Acquired in 2017, ILM is a leading product in the multifamily industry that scores every inbound and outbound interaction with prospective renters to enhance leasing performance. The solution also provides near-real-time metrics to deliver insight into the effectiveness of a community's marketing and advertising sources in attracting qualified prospects.

LeaseLabs

LeaseLabs provides digital marketing services and software. We acquired LeaseLabs, Inc. (“LeaseLabs”) in 2018 to extend our marketing platform by adding marketing analytical services, creative content design, direct marketing through social media channels, reputation management and geo-targeting solutions. LeaseLabs combined with our other solutions provide (i) marketing content, content management, and digital rights management from PropertyPhotos.com, (ii) websites and microsites, and (iii) ILM. This combined offering will be branded as the Go Direct Marketing Suite.

Lead2Lease CRM

Lead2Lease CRM is a lead management tool that cultivates lead generation, tracks lead activity and communications, and influences lead conversion.

Resident Screening

Screening is part of our risk mitigation platform to reduce rental payment delinquency. Resident screening uses many disparate data sources, including national credit bureaus and a large, proprietary database of on demand rental payment histories, to evaluate applicant credit profiles. Additional functionality includes criminal background checks and eviction history from real-time databases aggregated by third-party data providers. In addition, certain functionality enables owners and managers to optimize credit thresholds based on occupancy levels, and adjust deposit and rent amounts based on the default risk of the renter in a yield neutral manner.

MyNewPlace

MyNewPlace is a paid lead generation site that helps renters find rental housing options utilizing functionality that includes enhanced photography, 3D floor plans, SEO-enhanced descriptions, and neighborhood information. Our acquisition of Lease Rent Options in 2017 included the Rent Jungle product, which added additional functionality to our lead generation and leasing solutions.

Resident Services

Our resident services solutions provide a platform to optimize the transactional and social experience of prospects and renters, and enhance a property’s reputation. These solutions facilitate core renter management business processes including utility billing, renter payment processing, service requests, lease renewal, renter’s insurance, and consulting and advisory services. Our resident services solution category primarily consists of the following solutions: Resident Utility Management, Resident Payments, Resident Portal, Contact Center Maintenance, and Renter’s Insurance.

Resident Utility Management

Resident Utility Management is our on demand billing and utility management platform. In 2016, we augmented our utility management solutions with the acquisition of NWP Services Corporation (“NWP”), and we further expanded the service through our acquisition of American Utility Management (“AUM”) in 2017. In 2018, we acquired BluTrend, LLC (“BluTrend”) to expand our utility management platform with automation technology that speeds up invoice processing by extracting invoice data directly from utility companies, thereby eliminating the time to mail invoices. Combining the complementary functionalities of these solutions with our existing platform offers our clients automated convergent billing, utility invoice processing, utility cost management, automated energy recovery, infrastructure services (e.g., accounting, community energy, media, data, and telecom), the ability to benchmark energy consumption and cost, and sub-metering services.

Resident Payments

Payments is our on demand payment-processing platform that enables electronic collection of rent and other payments. Provided through our RealPage Payments subsidiaries with both operator and renter processing options for fee reduction, the platform accommodates the processing of multiple payment types including check, money order, automated clearing house (“ACH”), debit cards, and credit cards. Our acquisition of ClickPay Services, Inc. (“ClickPay”) in 2018 significantly expands our footprint into the HOA owner-occupied segment of real estate, broadens our presence in the New York metropolitan market and solidifies the integration of our front-end leasing platform into third-party property management systems.

Resident Portal

Resident Portal is our on demand platform for facilitating renter transactions, social engagement, and community management. Resident portal functionality includes online community facilitation (between multifamily property managers, local vendors, and other renters), service request placement and status, and lease renewals.

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Contact Center Maintenance

Contact Center Maintenance is our on demand platform for service request management. Functionality from the platform includes service call, email, and chat routing technology; service request tracking; and remote agent staffing, on a permanent or overflow basis to optimize the service request process. Enhancements include automated answering services and other features that amplify the ability of multifamily property managers to communicate with their residents.

Renter's Insurance

Renter's Insurance is part of our risk mitigation platform to reduce liability and property damage risk. The platform offers liability and content protection renter's insurance under the consumer-facing brand name "eRenterPlan." Liability policies protect property owners and managers against financial loss due to renter-caused damage, while content protection provides additional coverage for a renter's personal belongings in the event of loss. Our DepositIQ product allows residents an option of purchasing an affordable nonrefundable surety bond to guarantee lease obligations.

Asset Optimization

Our asset optimization solutions aim to optimize property financial and operational performance, and provide comprehensive analytics-based decision support for optimum investment performance throughout the phases of real estate investment (e.g., acquisition, operation, renovation, and disposition). These solutions facilitate core asset management, business intelligence, performance benchmarking and investment analysis including real-time yield management, revenue growth forecasting, key variable sensitivity forecasting, internal operating metric benchmarking and external market benchmarking. Our asset optimization solution category consists of these primary solutions: YieldStar Revenue Management, Business Intelligence, and Asset and Investment Management.

YieldStar Revenue Management

YieldStar is our on demand yield management platform. The platform includes real-time statistical models leveraging a repository of lease transaction data to calculate optimal rent for each rental unit, pricing management advisory services, and MPF Research, an apartment market research database. The data coverage and forecasting capabilities of YieldStar were expanded through our 2017 acquisitions of Axiometrics and Lease Rent Options. Augmenting our data science talent and modeling tools through these acquisitions allows our customers to achieve better harvesting and placement of capital in the rental housing industry.

Business Intelligence

Business intelligence is our on demand business intelligence platform designed to enable property owners and managers to outperform their peers. In 2018, we acquired Rentlytics, Inc. ("Rentlytics") to expand our business intelligence and performance analytics platform to provide owners and operators with normalized data across multiple third-party systems in order to resolve system incompatibility, data accuracy issues and time-to-analysis delays. Business intelligence functionality includes easy-to-use customized internal reporting at any aggregation level and during any time horizon, simultaneously leveraging operational, financial and marketing data. In addition, the platform includes a robust peer-benchmarking component that leverages a massive repository of lease transaction data for assessing both internal and external market performance metrics, economic tools for revenue forecasting, and key operating variable forecasting.

Asset and Investment Management

Asset and Investment Management is an integrated analytics platform providing general partners, limited partners, REITs and property management companies with increased transparency into their portfolios. The anchor component, Portfolio Asset Management ("PAM"), enables the collection of property level financial information and operational data across a portfolio, regardless of asset type or operational platform. Using PAM, portfolio managers can collect, share, analyze and report on critical metrics, facilitating better investment and operational decisions.

Professional Services

We have developed repeatable, cost-effective consulting and implementation services to assist our clients in taking advantage of our capabilities and solutions. Our consulting and implementation methodology leverages the nature of our on demand software architecture, the industry-specific expertise of our professional services employees, and the design of our platform to simplify and expedite the implementation process. Our consulting and implementation services include project and application management procedures, business process evaluation, business model development and data conversion. Our consulting teams work closely with customers to facilitate the smooth transition and operation of our solutions.

We offer training programs for training administrators and onsite property managers on the use of our solutions. Training options include regularly hosted classroom and online instruction (through our online learning courseware), as well as online webinars. Our clients can integrate their own training content with our content to deliver an integrated and customized training program for their on-site property managers.

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On Demand Delivery Infrastructure

Our IT infrastructure operates four redundant 40 GBPS dedicated fiber links connecting data centers containing hundreds of servers and multiple storage area networks. This architecture makes it possible to expand the data center incrementally with little or no disruption as more users or additional applications are added. With approximately 9,500 virtual servers, 700 physical servers and 8.0 petabytes of data storage, we leverage this infrastructure and massive repository of lease transaction data to power our platform of solutions.

Our infrastructure is based on an open architecture that enables end users and third-party applications to access our suite of property management-based software-as-a-service (“SAAS”) hosted applications through our public and private web services, web applications and application program interfaces (“APIs”). Billions of web transactions are processed per business day through our SAAS offering hosted on this expandable and open architecture based interface.

As of December 31, 2018, we employed approximately 330 employees who were responsible for maintaining data security, integrity, availability, performance and business continuity in our cloud computing facilities. We annually obtain a Service Organization Controls audit performed under Statements on Standards for Attestation Engagements No. 18 on a specified set of internal controls. Certain clients conduct separate business continuity audits of their own.

In addition to our production data centers, we manage a separate development and quality assurance testing facility used to control the pre-production testing required before each new release of our on demand software. We typically deploy new releases of the software underlying our on demand software solutions on a monthly or quarterly schedule depending on the solution.

RealPage Support

Our clients can access our support professionals by phone, web, chat or email for assistance in resolving issues and general questions about our solutions. We offer two product support options: Standard and Platinum Support. Standard Support includes product support during business hours Monday through Friday. Platinum Support includes the features of Standard Support, with customized engagement that includes a designated senior product support liaison. We also sponsor the RealPage User Group to facilitate communications between us and our community of users. The RealPage User Group is governed by a steering committee of our clients, which consists of two elected positions and subcommittee chairs, each representing a RealPage product center or group of product centers.

Product Development

We devote a substantial portion of our resources to developing new solutions and enhancing existing solutions, conducting product and quality assurance testing, improving core technology, and strengthening our technological expertise in the rental real estate industry. We typically deploy new releases of the software underlying our on demand software solutions on a monthly or quarterly schedule depending on the solution. As of December 31, 2018, our product development group consisted of approximately 610 employees in the United States and 720 employees located primarily in Hyderabad, India; Manila, Philippines; and Cebu City, Philippines. Product development expense totaled $118.5 million, $89.5 million and $73.6 million during the years ended December 31, 2018, 2017, and 2016, respectively.

Sales and Marketing

We sell our rental real estate software and services through our direct sales organization. We organize our sales force by geographic region, size of our prospective clients, and property type. We believe this focus provides a higher level of service and understanding of our clients’ unique needs. Our typical sales cycle with a prospective client begins with the generation of a sales lead through Internet marketing, email campaigns, telemarketing efforts, trade shows, or other means of referral. The sales lead is followed by an assessment of the prospective client’s requirements, sales presentations, and product demonstrations. Our sales cycle can vary substantially from client to client but typically requires three to six months for larger clients and one to six weeks for smaller clients.

In addition to new client sales, we sell additional solutions and consulting services to our existing clients to help them more efficiently and effectively manage their properties as the rental real estate market evolves and competitive conditions change.

We generate qualified client leads, accelerate sales opportunities, and build brand awareness through our marketing programs. Our marketing programs target property management company executives, technology professionals, and senior business leaders. Our marketing team focuses on the unique needs of clients within our target markets. Our marketing programs include the following activities:

- field marketing events for clients and prospects;
- participation in, and sponsorship of, user conferences, trade shows, and industry events;
- client programs, including client user meetings and our online client community;

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- online marketing activities, including online advertising and SEO, email campaigns, web campaigns, white papers, free product trials and demos, webcasts, case studies, and the use of social media, including blogging, Facebook, LinkedIn, and Twitter;
- public relations;
- use of our website to provide product and company information, as well as learning opportunities for potential clients; and
- ongoing consumer email marketing campaigns that drive adoption of transactional products, such as online payments and renter's insurance, by residents on behalf of our property management clients.

We host an annual user conference where clients both participate in and lead various types of sessions and planned discussions designed to help accelerate business performance through the use of our integrated platform of solutions. The conference features a variety of client speakers, panelists, and presentations focused on businesses of all sizes. The event also brings together our clients, technology vendors, service providers, and other key participants in the rental real estate industry to exchange ideas and best practices for improving business performance. Attendees gain insight into our product plans and participate in interactive sessions that give them the opportunity to provide input into new features and functionality.

Strategic Relationships

We maintain relationships with a variety of technology vendors and service providers to enhance the capabilities of our integrated platform of solutions. This approach allows us to expand our platform and client base and to enter new markets. We have established the following types of strategic relationships:

Technology Vendors

We have relationships with a number of leading technology companies whose products we integrate into our platform or offer to complement our solutions. The cooperative relationships with our software and hardware technology partners allow us to build, optimize, and deliver a broad range of solutions to our clients.

Service Providers

We have relationships with a number of service providers that offer complementary services that integrate into our platform and address key requirements of rental property owners and managers, including credit card and ACH services, transaction processing capabilities, and insurance underwriting services.

Clients

We are committed to developing long-term client relationships and working closely with our clients to configure our solutions to meet the evolving needs of the rental real estate industry. Our clients include REITs, leading property management companies, fee managers, regionally based owner operators, vacation property owners, and service providers. As of December 31, 2018, we had over 12,200 clients who used one or more of our on demand software solutions to help manage the operations of approximately 16.2 million rental real estate units. Our clients include each of the ten largest multifamily property management companies in the United States, ranked as of January 1, 2018 by the NMHC, based on number of units managed. For the years ended December 31, 2018, 2017 and 2016, no one client accounted for more than 10% of our revenue. Revenues for our largest client were 5.9%, 6.2%, and 5.7% of total revenues for the years ended December 31, 2018, 2017, and 2016, respectively.

Intellectual Property

We rely on a combination of copyright, trademark, and trade secret laws, as well as confidentiality procedures and contractual restrictions, to establish and protect our proprietary rights. These laws, procedures, and restrictions provide only limited protection. We currently have a limited number of patents and pending patent applications. In the future, we may file additional patent applications, but patents may not be issued with respect to these patent applications, or if patents are issued, they may not provide us with any competitive advantages, may not be issued in a manner that gives us the protection that we seek, and may be successfully challenged by third parties.

We endeavor to enter into agreements with our employees and contractors and with parties with whom we do business in order to limit access to and disclosure of our proprietary information. We cannot be certain that the steps we have

taken will prevent unauthorized use or reverse engineering of our technology. Moreover, others may independently develop technologies that are competitive with ours or that infringe on our intellectual property. The enforcement of our intellectual property rights also depends on any legal actions against these infringers being successful, but these actions may not be successful, even when our rights have been infringed.
Furthermore, effective patent, trademark, trade dress, copyright, and trade secret protection may not be available in every country in which our solutions are available over the Internet. In addition, the legal standards relating to the validity, enforceability, and scope of protection of intellectual property rights are uncertain and still evolving.

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Employees

As of December 31, 2018, we had approximately 6,200 employees. We believe that our success is attributable in large part to our employees and an experienced management team, many members of which have years of industry experience in building, implementing, marketing, and selling property management solutions critical to business operations. Our future performance depends upon the continued service of our key sales, marketing, technical, and senior management personnel and our continuing ability to attract and retain highly qualified personnel. We believe we have a corporate culture that attracts highly qualified and motivated employees. We consider our current relationship with our employees to be good. Our employees are not represented by a labor union and are not subject to a collective bargaining agreement.

Available Information

We maintain an Internet website at www.realpage.com. We make available, free of charge, on our website, our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments to those reports, as soon as reasonably practicable after providing such reports to the Securities and Exchange Commission ("SEC").

We file annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, proxy statements, and other documents with the SEC under the Securities Exchange Act of 1934, as amended. The SEC maintains an Internet website that contains reports, proxy, and information statements and other information regarding issuers, including RealPage, Inc., that file electronically with the SEC. The public can obtain any document we file with the SEC at www.sec.gov. Information contained on, or connected to, our website is not incorporated by reference into this Annual Report on Form 10-K and should not be considered part of this Annual Report on Form 10-K or any other filing that we make with the SEC.

Item 1A. Risk Factors.

Financial Risks Related to Our Business

Our quarterly operating results have fluctuated in the past and may fluctuate in the future, which could cause our stock price to decline.

Our quarterly operating results may fluctuate as a result of a variety of factors, many of which are outside of our control. Fluctuations in our quarterly operating results may be due to a number of factors, including the risks and uncertainties discussed elsewhere in this filing. Some of the important factors that could cause our revenues and operating results to fluctuate from quarter to quarter include:

- the extent to which on demand software solutions maintain market acceptance;
- fluctuations in leasing activity by our clients;
- our ability to timely introduce enhancements to our existing solutions and new solutions;
- our ability to renew the use of our on demand solutions for units managed by our existing clients and to increase the use of our on demand solutions for the management of units by our existing and new clients;
- changes in our pricing policies or those of our competitors or new competitors;
- the variable nature of our sales and implementation cycles;
- our ability to anticipate and adapt to external forces and the emergence of new technologies and products;
- our ability to enter into new markets and capture additional market share;
- our ability to integrate acquisitions in a cost-effective and timely manner;
- the timing of revenue and expenses related to recent and potential acquisitions or dispositions of businesses or technologies;
- changes in local economic, political and regulatory environments of our international operations;
- general economic, industry and market conditions in the rental housing industry that impact our current and potential clients;
- the amount and timing of our investment in research and development activities;

- technical difficulties, service interruptions, data or document losses or security breaches;
- our ability to hire and retain qualified key personnel, including particular key positions in our sales force and IT department;
- changes in the legal, regulatory or compliance environment related to the rental housing industry or the markets in which we operate, including without limitation changes related to fair credit reporting, payment processing, data

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protection and privacy, utility billing, insurance, the Internet and e-commerce, licensing, telemarketing, electronic communications, consumer protection, the Health Insurance Portability and Accountability Act of 1996 ("HIPAA") and the Health Information Technology Economic and Clinical Health Act ("HITECH");

- the amount and timing of operating expenses and capital expenditures related to the expansion of our operations and infrastructure;
- increase in the number or severity of insurance claims on policies sold by us;
- litigation and settlement costs, including unforeseen costs;
- new accounting pronouncements and changes in accounting standards or practices, particularly any affecting the recognition of subscription revenue or accounting for mergers and acquisitions; and
- changes in tax policy in the United States and globally that affect the deductibility of certain expenses and how our profits are taxed, including the "Tax Reform Act," as defined below.

Fluctuations in our quarterly operating results or guidance that we provide may lead analysts to change their long-term models for valuing our common stock, cause us to face short-term liquidity issues, impact our ability to retain or attract key personnel or cause other unanticipated issues, all of which could cause our stock price to decline. As a result of the potential variations in our quarterly revenue and operating results, we believe that quarter-to-quarter and year-to-date period comparisons of our revenues and operating results may not be meaningful and the results of any one quarter should not be relied upon as an indication of future performance.

If we are unable to continue to manage the growth of our diverse and complex operations, our financial performance may suffer.

The growth in the size, dispersed geographic locations, complexity and diversity of our business and the expansion of our product lines and client base has placed, and our anticipated growth may continue to place, a significant strain on our managerial, administrative, operational, financial and other resources. We had approximately 6,200 employees and over 12,200 on demand clients as of December 31, 2018. We expect to continue to experience growth, including through acquisitions. Our ability to effectively manage our anticipated future growth will depend on, among other things, the following:

- successfully supporting and maintaining a broad range of current and emerging solutions;
- identifying suitable acquisition targets and efficiently managing the closing of acquisitions and the integration of targets into our operations;
- maintaining continuity in our senior management and key personnel;
- attracting, retaining, training and motivating our employees, particularly technical, client service and sales personnel;
- enhancing our financial and accounting systems and controls;
- enhancing our information technology infrastructure, processes and controls;
- successfully completing system upgrades and enhancements; and
- managing expanded operations in geographically dispersed locations.

If we do not manage the size, complexity and diverse nature of our business effectively, we could experience product performance issues, delayed software releases and longer response times for assisting our clients with implementation of our solutions and could lack adequate resources to support our clients on an ongoing basis, any of which could adversely affect our reputation in the market and our ability to generate revenue from new or existing clients.

Because we recognize subscription revenue over the term of the applicable client agreement, a decline in subscription renewals or new service agreements may not be reflected immediately in our operating results.

We generally recognize revenue from clients ratably over the terms of their client agreements, which are typically for a period of one or more years. As a result, much of the revenue we report in each quarter is deferred revenue from client agreements entered into during previous quarters. Consequently, a decline in new or renewed client agreements in any one quarter will not be fully reflected in our revenue or our results of operations until future periods. Accordingly, this revenue recognition model also makes it difficult for us to rapidly increase our revenue through additional sales in any period, as revenue from new clients must be recognized over the applicable subscription term.

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Transactions relating to our Convertible Notes may adversely affect our financial condition and operating results.
Holders of the Convertible Notes are entitled to convert the Convertible Notes under certain conditions for specified periods at their option prior to the scheduled maturity of the Convertible Notes. When holders elect to convert their Convertible Notes, unless we elect to satisfy our conversion obligation by delivering solely shares of our common stock (other than paying cash in lieu of delivering any fractional share), we are required to settle a portion or all of our conversion obligation through the payment of cash, which could adversely affect our liquidity. In addition, even if holders do not elect to convert their Convertible Notes, we could be required under applicable accounting rules to reclassify all or a portion of the outstanding principal of the Convertible Notes as a current rather than long-term liability, which would result in a material reduction of our net working capital.
The accounting method for convertible debt securities that may be settled in cash, such as the Convertible Notes, could have a material effect on our reported financial results.
In May 2008, the Financial Accounting Standards Board ("FASB") issued FASB Staff Position No. APB 14-1, Accounting for Convertible Debt Instruments That May Be Settled in Cash Upon Conversion (Including Partial Cash Settlement), which has subsequently been codified as Accounting Standards Codification 470-20, Debt with Conversion and Other Options, which we refer to as ASC 470-20. Under ASC 470-20, an entity must separately account for the liability and equity components of the convertible debt instruments, such as the Convertible Notes, that may be settled entirely or partially in cash upon conversion in a manner that reflects the issuer's economic interest cost. The effect of ASC 470-20 on the accounting for the Convertible Notes is that the equity component is required to be included in the additional paid-in capital section of stockholders' equity on our Consolidated Balance Sheets, and the value of the equity component would be treated as original issue discount for purposes of accounting for the debt component of the Convertible Notes. As a result, we will be required to record a greater amount of non-cash interest expense in current periods presented as a result of the amortization of the discounted carrying value of the Convertible Notes to their face amount over the term of the Convertible Notes. We will report lower net income in our financial results because ASC 470-20 will require interest to include both the current period's amortization of the debt discount and the instrument's coupon interest, which could adversely affect our reported or future financial results, and the trading price of our common stock.
In addition, under certain circumstances, convertible debt instruments, such as the Convertible Notes, that may be settled entirely or partly in cash are currently accounted for utilizing the treasury stock method, the effect of which is that the shares issuable upon conversion of the Convertible Notes are not included in the calculation of diluted earnings per share except to the extent that the conversion value of the Convertible Notes exceeds their principal amount. Under the treasury stock method, for diluted earnings per share purposes, the transaction is accounted for as if the number of shares of common stock that would be necessary to settle such excess, if we elected to settle such excess in shares, are issued. We cannot be sure that the accounting standards in the future will continue to permit the use of the treasury stock method. If we are unable to use the treasury stock method in accounting for the shares issuable upon conversion of the Convertible Notes, then our diluted earnings per share would be adversely affected.
If we are not able to integrate past or future acquisitions successfully, our operating results and prospects could be harmed.
We have acquired new technology and domain expertise through multiple acquisitions, including our most recent acquisitions of Rentlytics, LeaseLabs, BluTrend, ClickPay, LRO, On-Site, PEX, AUM, and Axiometrics. We expect to continue making acquisitions in the future. The success of our future acquisition strategy will depend on our ability to identify, negotiate, complete and integrate acquisitions. Acquisitions are inherently risky, and any acquisitions we complete may not be successful. Any acquisitions we pursue involve numerous risks, including the following:

- difficulties in integrating and managing the operations and technologies of the companies we acquire;
- diversion of our management's attention from normal daily operations of our business;
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our inability to maintain the clients, the key employees, the key business relationships and the reputations of the businesses we acquire;

- our inability to generate sufficient revenue from acquisitions to offset our increased expenses associated with acquisitions;
- difficulties in predicting or achieving the synergies between acquired businesses and our own businesses;
- our responsibility for the liabilities of the businesses we acquire, including, without limitation, liabilities arising out of their failure to maintain effective data security, data integrity, disaster recovery and privacy controls prior to the acquisition, or their infringement or alleged infringement of third-party intellectual property, contract or data access rights prior to the acquisition;
- difficulties in complying with new markets or regulatory standards to which we were not previously subject;

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- delays in our ability to implement internal standards, controls, procedures and policies in the businesses we acquire; and
- adverse effects of acquisition activity on the key performance indicators we use to monitor our performance.

Our current acquisition strategy includes the acquisition of complementary businesses, products, and solutions. In order to integrate and fully realize the benefits of such acquisitions, we expect to build application interfaces that enable such clients to use a wide range of our solutions while they continue to use their legacy management systems. In addition, over time we expect to migrate each acquired company's clients to our on demand property management solutions to retain them as clients and to be in a position to offer them our solutions on a cost-effective basis. These efforts may be unsuccessful or entail costs that result in losses or reduced profitability.

Unanticipated events and circumstances occurring in future periods may affect the realizability of our intangible assets obtained through acquisitions. The events and circumstances that we consider include significant under-performance relative to projected future operating results and significant changes in our overall business or product strategies. These events and circumstances may cause us to revise our estimates and assumptions used in analyzing the value of our other intangible assets with indefinite lives, and any such revision could result in a non-cash impairment charge that could have a material impact on our financial results.

We may be unable to secure the equity or debt funding necessary to finance future acquisitions on terms that are acceptable to us, or at all. If we finance acquisitions by issuing equity or convertible debt securities, our existing stockholders will likely experience ownership dilution, and if we finance future acquisitions with debt funding, we will incur interest expense and may have to comply with additional financing covenants or secure that debt obligation with our assets.

Variability in our sales and activation cycles could result in fluctuations in our quarterly results of operations and cause our stock price to decline.

The sales and activation cycles for our solutions, from initial contact with a prospective client to contract execution and activation, vary widely by client and solution. We do not recognize revenue until the solution is activated. While most of our activations follow a set of standard procedures, a client's priorities may delay activation and our ability to recognize revenue, which could result in fluctuations in our quarterly operating results. Additionally, certain of our products are offered in suites containing multiple solutions, resulting in additional fluctuation in activations depending on each client's priorities with respect to solutions included in the suite.

Many of our clients are price sensitive, and if market dynamics require us to change our pricing model or reduce prices, our operating results will be harmed.

Many of our existing and potential clients are price sensitive, and uncertain global economic conditions, as well as decreased leasing velocity, have contributed to increased price sensitivity in the multifamily housing market and the other markets that we serve. As market dynamics change, or as new and existing competitors introduce more competitive pricing or pricing models, we may be unable to renew our agreements with existing clients or clients of the businesses we acquire or attract new clients at the same price or based on the same pricing model as previously used. As a result, it is possible that we may be required to change our pricing model, offer price incentives or reduce our prices, which could harm our revenue, profitability and operating results.

Economic trends that affect the rental housing market may have a negative effect on our business.

Our clients include a range of organizations whose success is closely linked to the rental housing market. Economic trends that negatively or positively affect the rental housing market may adversely affect our business. Instability or downturns affecting the rental housing market may have a material adverse effect on our business, prospects, financial condition and results of operations by:

- decreasing demand for leasing and marketing solutions;
- reducing the number of occupied sites and units on which we earn revenue;
- preventing our clients from expanding their businesses and managing new properties;
- causing our clients to reduce spending on our solutions;

- subjecting us to increased pricing pressure in order to add new clients and retain existing clients;
- causing our clients to switch to lower-priced solutions provided by our competitors or internally developed solutions;
- delaying or preventing our collection of outstanding accounts receivable; and
- causing payment processing losses related to an increase in client insolvency.

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In addition, economic trends that reduce the frequency of renter turnover or the quantity of new renters may reduce the number of rental transactions completed by our clients and may, as a result, reduce demand for our rental, leasing or marketing transaction specific services.

We may require additional capital to support business growth or acquisitions, and this capital might not be available on terms acceptable to us or at all.

We intend to continue to make investments to support our business growth and may require additional funds to respond to business challenges or opportunities, including the need to develop new solutions or enhance our existing solutions, enhance our operating infrastructure or acquire businesses and technologies. Accordingly, we may need to engage in equity or debt financings to secure additional funds. If we raise additional funds through further issuances of equity or convertible debt securities, our existing stockholders could suffer significant ownership dilution, and any new equity securities we issue could have rights, preferences and privileges superior to those of holders of our common stock. On May 29, 2018, we consummated an underwritten public offering of 8.05 million shares of our common stock, with total gross proceeds of $458.9 million. In 2017 and the first quarter of 2018, we amended our Credit Facility to increase our borrowing capacity, and in 2017 we completed a convertible debt offering in which we sold $345.0 million of Convertible Notes. Future debt financing could increase our interest expense and could involve additional restrictive covenants relating to our capital raising activities and other financial and operational matters, which may make it more difficult for us to obtain additional capital and to pursue business opportunities, including potential acquisitions. In addition, we may not be able to obtain additional financing on terms favorable to us, if at all. If we are unable to obtain adequate financing or financing on terms satisfactory to us when we require it, our ability to continue to support our business growth and to respond to business challenges or opportunities could be significantly limited.

Our Credit Facility contains restrictions that impact our business and expose us to risks that could adversely affect our liquidity and financial condition.

All of our obligations under the Credit Facility are secured by substantially all of our assets. All of our existing and future domestic subsidiaries are required to guarantee our obligations under the Credit Facility, other than certain immaterial subsidiaries, foreign subsidiary holding companies and our payment processing subsidiaries. Such guarantees by existing and future domestic subsidiaries are and will be secured by substantially all of the assets of such subsidiaries.

Our Credit Facility contains customary covenants, subject in each case to customary exceptions and qualifications, which limit our and certain of our subsidiaries' ability to, among other things:

- incur additional indebtedness or guarantee indebtedness of others;
- create liens on our assets;
- enter into mergers or consolidations;
- dispose of assets;
- prepay certain indebtedness;
- make changes to our governing documents and certain of our agreements;
- pay dividends and make other distributions on our capital stock, and redeem and repurchase our capital stock;
- make investments, including acquisitions; and
- enter into transactions with affiliates.

Our Credit Facility also contains, subject in each case to customary exceptions and qualifications, customary affirmative covenants. We are also required to comply with a maximum Consolidated Net Leverage Ratio, a maximum Consolidated Senior Secured Net Leverage Ratio, and a minimum Consolidated Interest Coverage Ratio. See additional discussion of these requirements in Note 8 to the Consolidated Financial Statements under Item 8 of this Annual Report on Form 10-K. As of December 31, 2018, we were in compliance with all of the covenants under our Credit Facility.

The Credit Facility contains customary events of default, subject to customary cure periods for certain defaults, that include, among others, non-payment defaults, covenant defaults, material judgment defaults, bankruptcy and insolvency defaults, cross-defaults to certain other material indebtedness, ERISA defaults, inaccuracy of representations and warranties and a change in control default.

Even if we comply with all of the applicable covenants, the restrictions on the conduct of our business could adversely affect our business by, among other things, limiting our ability to take advantage of financings, mergers, acquisitions and other corporate opportunities that may be beneficial to the business. Even if the Credit Facility was terminated, additional debt we could incur in the future may subject us to similar or additional covenants.

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A significant decline in our cash flow could impair our ability to make payments under our debt obligations.

If we experience a decline in cash flow due to any of the factors described in this “Risk Factors” section or otherwise, we could have difficulty paying interest and principal amounts due on our indebtedness and meeting the financial covenants set forth in our Credit Facility. If we are unable to generate sufficient cash flow or otherwise obtain the funds necessary to make required payments under our Credit Facility or Convertible Notes Indenture, or if we fail to comply with the requirements of our indebtedness, we could default under our Credit Facility or Convertible Notes Indenture. Any default that is not cured or waived could result in the termination of the revolving commitments, the acceleration of the obligations under the Credit Facility or Convertible Notes Indenture, an increase in the applicable interest rate under the Credit Facility and a requirement that our subsidiaries that have guaranteed the Credit Facility pay the obligations in full, and would permit our lenders to exercise remedies with respect to all of the collateral that is securing the Credit Facility, including substantially all of our and our subsidiary guarantors’ assets. Any such default could have a material adverse effect on our liquidity and financial condition.

If we fail to maintain proper and effective internal controls, our ability to produce accurate and timely financial statements could be impaired, which could harm our operating results, our ability to operate our business and investors’ views of us.

Ensuring that we have adequate internal financial and accounting controls and procedures so that we can produce accurate financial statements on a timely basis is a costly and time-consuming effort that needs to be re-evaluated frequently. Our 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 in accordance with United States generally accepted accounting principles. We are required to comply with Section 404 of the Sarbanes-Oxley Act of 2002, or the Sarbanes-Oxley Act, which requires annual management assessment of the effectiveness of our internal control over financial reporting and a report by our independent auditors. During May 2018 and as disclosed in our Form 10-Q for the quarter ended March 31, 2018, we were the subject of a targeted email phishing campaign that led to a business email compromise, pursuant to which an unauthorized party gained access to an external third party system used by a subsidiary that we acquired in 2017. As a result, our management determined that the related control deficiencies constituted a material weakness. See Note 1 to our Consolidated Financial Statements herein for additional information regarding this matter. This material weakness was remediated during the quarter ended June 30, 2018. If we fail to maintain proper and effective internal controls in the future, our ability to produce accurate and timely financial statements could be impaired, which could harm our operating results, harm our ability to operate our business and reduce the trading price of our stock.

Changes in, or errors in our interpretations and applications of, financial accounting standards or practices may cause adverse, unexpected financial reporting fluctuations and affect our reported results of operations.

A change in accounting standards or practices can have a significant effect on our reported results and may even affect our reporting of transactions completed before the change is effective. New accounting pronouncements and varying interpretations of accounting pronouncements have occurred and may occur in the future. Changes to existing rules or the questioning of current practices or errors in our interpretations and applications of financial accounting standards or practices may adversely affect our reported financial results or the way in which we conduct our business.

For more information on recently issued accounting standards, see Note 2 to our Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K.

We generate commission revenue from the insurance policies we sell as a registered insurance agent, and if insurance premiums decline or if the insureds experience greater than expected losses, our revenues could decline and our operating results could be harmed.

Through our wholly owned subsidiaries, we generate commission revenue from offering liability and renter’s insurance. We also sell additional insurance products, including auto and other personal lines insurance, to renters that buy renter's insurance from us. These policies are ultimately underwritten by various insurance carriers. Some of the property owners and managers that participate in our programs opt to require renters to purchase rental insurance policies and agree to grant to us exclusive marketing rights at their properties. If demand for residential rental housing declines, property owners and managers may be forced to reduce their rental rates and to stop requiring the purchase of rental insurance in order to reduce the overall cost of renting. If property owners or managers cease to require renter's insurance, elect to offer policies from competing providers or insurance premiums decline, our revenues from selling insurance policies will be adversely affected.

Additionally, one type of commission paid by insurance carriers to us is contingent commission, which is affected by claims experienced at the properties for which the renters purchase insurance. In the event that the severity or frequency of claims by the insureds increase unexpectedly, the contingent commission we typically earn will be adversely affected. As a result, our quarterly, or annual, operating results could fall below the expectations of analysts or investors, in which event our stock price may decline.

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Our ability to use net operating losses to offset future taxable income may be subject to certain limitations.
In general, under Section 382 of the Internal Revenue Code of 1986, as amended, or the Internal Revenue Code, a corporation that undergoes an "ownership change" is subject to limitations on its ability to utilize its pre-change net operating losses, or NOLs, to offset future taxable income. Our ability to utilize NOLs of companies that we have acquired or may acquire in the future may be subject to limitations. Future changes in our stock ownership, some of which are outside of our control, could result in an ownership change under Section 382 of the Internal Revenue Code. For these reasons, we may not be able to utilize a material portion of the NOLs reflected on our balance sheet, even if we maintain profitability.
If we are required to collect sales and use taxes on the solutions we sell in additional taxing jurisdictions, we may be subject to liability for past sales and our future sales may decrease.
States and some local taxing jurisdictions have differing rules and regulations governing sales and use taxes, and these rules and regulations are subject to varying interpretations that may change over time. We review these rules and regulations periodically and currently collect and remit sales taxes in taxing jurisdictions where we believe we are required to do so. However, additional state and/or local taxing jurisdictions may seek to impose sales or other tax collection obligations on us, including for past sales. A successful assertion that we should be collecting additional sales or other taxes on our solutions could result in substantial tax liabilities for past sales, discourage clients from purchasing our solutions or otherwise harm our business and operating results. This risk may be greater with regard to solutions acquired through acquisitions because the acquired entities may not have had the same practices and procedures that we have in place.
We may also become subject to tax audits or similar procedures in jurisdictions where we already collect and remit sales taxes. A successful assertion that we have not collected and remitted taxes at the appropriate levels may also result in substantial tax liabilities for past sales. Liability for past taxes may also include very substantial interest and penalty charges. Our client contracts provide that our clients must pay all applicable sales and similar taxes. Nevertheless, clients may be reluctant to pay back taxes and may refuse responsibility for interest or penalties associated with those taxes. If we are required to collect and pay back taxes and the associated interest and penalties, and if our clients fail or refuse to reimburse us for all or a portion of these amounts, we will incur unplanned expenses that may be substantial. Moreover, imposition of such taxes on our solutions going forward will effectively increase the cost of such solutions to our clients and may adversely affect our ability to continue to sell those solutions to existing clients or to gain new clients in the areas in which such taxes are imposed.
Changes to applicable U.S. or foreign tax laws and regulations may have a material adverse effect on our business, financial condition and results of operations.
We are subject to federal and state income taxes in the United States and various foreign jurisdictions, and our domestic and international tax liabilities are subject to the allocation of expenses in differing jurisdictions. Our tax rate is affected by changes in the mix of earnings and losses in jurisdictions with differing statutory tax rates, including jurisdictions in which we have completed or may complete acquisitions and the valuation of deferred tax assets and liabilities, including our ability to utilize our net operating losses. Increases in our effective tax rate could harm our operating results.
The Tax Cuts and Jobs Act ("Tax Reform Act"), which was signed into law on December 22, 2017, contains significant changes to the U.S. federal income tax laws, including changes to the corporate tax rate, business-related deductions, and taxation of foreign earnings, among others, that are generally effective for taxable years beginning after December 31, 2017. Throughout calendar year 2018, the U.S. Treasury and certain states issued proposed and final legislation and clarifying guidance with respect to the various provisions of the Tax Reform Act. Additional legislation and guidance may still be issued in the future, which could have a material adverse impact on the value of our U.S. deferred tax assets, result in significant changes to currently computed income tax liabilities for past and current tax periods, and increase our future U.S. tax expense. The implementation by us of new practices and processes designed to comply with, and benefit from, the Tax Reform Act and its rules and regulations could require us to make

substantial changes to our business practices, allocate additional resources, and increase our costs, which could negatively affect our business, results of operations and financial condition.

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Operational Risks Related to Our Business

The nature of our platform is complex and highly integrated, and if we fail to successfully manage releases or integrate new solutions, it could harm our revenues, operating income and reputation.

We manage a complex platform of solutions that consists of our property management solutions, integrated software-enabled value-added services and advertising and lease generation services. Many of our solutions include a large number of product centers that are highly integrated and require interoperability with other RealPage, Inc. products, as well as products and services of third-party service providers. Additionally, we typically deploy new releases of the software underlying our on demand software solutions on a bi-weekly, monthly or quarterly schedule, depending on the solution. Due to this complexity and the condensed development cycles under which we operate, we may experience errors in our software, corruption or loss of our data or unexpected performance issues from time to time. For example, our solutions may face interoperability difficulties with software operating systems or programs being used by our clients, or new releases, upgrades, fixes or the integration of acquired technologies may have unanticipated consequences on the operation and performance of our other solutions. If we encounter integration challenges or discover errors in our solutions late in our development cycle, it may cause us to delay our launch dates. Any major integration or interoperability issues or launch delays could have a material adverse effect on our revenues, operating income and reputation.

Our business depends substantially on the renewal of our products and services for on demand units managed by our clients and the increase in the use of our on demand products and services for on demand units.

We generally license our solutions pursuant to client agreements with a term of one year or longer. The pricing of the agreements is typically based on a price per unit basis. Our clients have no obligation to renew these agreements after their term expires, or to renew these agreements at the same or higher annual contract value. In addition, under specific circumstances, our clients have the right to cancel their client agreements before they expire, for example, in the event of an uncured breach by us, or in some circumstances, upon the sale or transfer of a client property, by giving 30 days' notice or paying a cancellation fee. In addition, clients often purchase a higher level of professional services in the initial term than they do in renewal terms to ensure successful activation. As a result, our ability to grow is dependent in part on clients purchasing additional solutions or increasing the number of units they own or manage after the initial term of their client agreement. Though we maintain and analyze historical data with respect to rates of client renewals, upgrades and expansions, those rates may not accurately predict future trends in renewal of on demand units. Our clients' on demand unit renewal rates may decline or fluctuate for a number of reasons, including, but not limited to, their level of satisfaction with our solutions, our pricing, our competitors' pricing, reductions in our clients' spending levels or reductions in the number of on demand units managed by our clients. If our clients cancel or amend their agreements with us during their term, do not renew their agreements, renew on less favorable terms or do not purchase additional solutions or professional services in renewal periods, our revenue may grow more slowly than expected or decline and our profitability may be harmed.

Additionally, we have experienced, and expect to continue to experience, some level of on demand unit attrition as properties are sold and the new owners and managers of properties previously owned or managed by our clients do not continue to use our solutions. We cannot predict the amount of on demand unit turnover we will experience in the future. However, we have experienced higher rates of on demand unit attrition with our Propertyware property management system, primarily because it serves smaller properties than our OneSite property management system, and we may experience higher levels of on demand unit attrition to the extent Propertyware grows as a percentage of our revenues. If we experience increased on demand unit turnover, our financial performance and operating results could be adversely affected.

On demand revenue that is derived from products that help owners and managers lease and market apartments, such as certain products in LeaseStar and LeasingDesk, may decrease as occupancy rates rise. We have also experienced, and expect to continue to experience, some number of consolidations of our clients with other parties. In addition, if one of our clients is consolidated with another client, the acquiring client may have negotiated lower prices for our solutions or may use fewer of our solutions than the acquired client. In each case, the consolidated entity may attempt to negotiate lower prices for using our solutions as a result of the entity's increased size. These consolidations may cause us to lose on demand units or require us to reduce prices as a result of enhanced client leverage, which could cause our financial performance and operating results to be adversely affected.

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We may not be able to continue to add new clients and retain and increase sales to our existing clients, which could adversely affect our operating results.

Our revenue growth is dependent on our ability to continually attract new clients while retaining and expanding our service offerings to existing clients. Growth in the demand for our solutions may be inhibited and we may be unable to sustain growth in our sales for a number of reasons, including, but not limited to:

- our failure to develop new or additional solutions;
- our inability to market our solutions in a cost-effective manner to new clients or in new vertical or geographic markets;
- our inability to expand our sales to existing clients;
- our inability to build and promote our brand; and
- perceived or actual security, integrity, reliability, quality or compatibility problems with our solutions.

A substantial amount of our past revenue growth was derived from purchases of upgrades and additional solutions by existing clients. Our costs associated with increasing revenue from existing clients are generally lower than costs associated with generating revenue from new clients. Therefore, a reduction in the rate of revenue increase from our existing clients, even if offset by an increase in revenue from new clients, could reduce our profitability and have a material adverse effect on our operating results.

If we are unable to successfully develop or acquire and sell enhancements and new solutions, our revenue growth will be harmed and we may not be able to meet profitability expectations.

The industry in which we operate is characterized by rapidly changing client requirements, technological developments and evolving industry standards. Our ability to attract new clients and increase revenue from existing clients will depend in large part on our ability to successfully develop, bring to market and sell enhancements to our existing solutions and new solutions that effectively respond to the rapid changes in our industry. Any enhancements or new solutions that we develop or acquire may not be introduced to the market in a timely or cost-effective manner and may not achieve the broad market acceptance necessary to generate the revenue required to offset the operating expenses and capital expenditures related to development or acquisition. If we are unable to timely develop or acquire and sell enhancements and new solutions that keep pace with the rapid changes in our industry, our revenue will not grow as expected and we may not be able to maintain or meet profitability expectations.

Any disruption of service at our data centers or other facilities could interrupt or delay our clients’ access to our solutions, which could harm our operating results.

The ability of our clients to access our service is critical to our business. We host our products and services, support our operations and service our clients primarily from data centers in the Dallas, Texas area, but also from data centers located elsewhere in the United States and in Europe.

We may fail to provide such service as a result of numerous factors, many of which are beyond our control, including, without limitation: mechanical failure, power outage, human error, physical or electronic security breaches, war, terrorism and related conflicts or similar events worldwide, fire, earthquake, hurricane, flood and other natural disasters, sabotage and vandalism. We attempt to mitigate these risks at our Texas-based data centers and other facilities through various business continuity efforts, including: redundant infrastructure, 24 x 7 x 365 system activity monitoring, backup and recovery procedures, use of a secure off-site storage facility for backup media, separate test systems and rotation of management and system security measures, but our precautions may not protect against all potential problems. Disaster recovery procedures are in place to facilitate the recovery of our operations, products and services within the stated service level goals. Our secondary data center is equipped with physical space, power, storage and networking infrastructure and Internet connectivity to support the solutions we provide in the event of the interruption of services at our primary data center. Even with this secondary data center, however, our operations would be interrupted during the transition process should our primary data center experience a failure. Moreover, both our primary and secondary data centers are located in the greater metropolitan Dallas area. As a result, any regional disaster could affect both data centers and result in a material disruption of our services.

Problems at one or more of our data centers, whether or not within our control, could result in service disruptions or delays or loss or corruption of data or documents. This could damage our reputation, cause us to issue credits to clients, subject us to potential liability or costs related to defending against claims, or cause clients to terminate or elect not to renew their agreements, any of which could negatively impact our revenues and harm our operating results.

Interruptions or delays in service from our third-party data center providers could impair our ability to deliver certain of our products to our clients, resulting in client dissatisfaction, damage to our reputation, loss of clients, limited growth and reduction in revenue.

Our products and services are hosted and supported from data centers in various geographic locations within the continental United States and Europe, and are operated by third-party providers. Our operations depend on our third-party data center providers' abilities to protect these facilities against damage or interruption from natural disasters, power or telecommunications failures, criminal acts and similar events. In the event that any of our third-party hosting or facilities arrangements is terminated, or if there is a lapse of service or damage to a facility, we could experience interruptions in the availability of our on demand software as well as delays and additional expenses in arranging new facilities and services.

Despite precautions taken at these third party data centers, the occurrence of spikes in usage volume, a natural disaster, an act of terrorism, adverse changes in United States or foreign laws and regulations, vandalism or sabotage, a decision to close a third-party facility without adequate notice, or other unanticipated problems at a facility could result in lengthy interruptions in the availability of our on demand software. Even with current and planned disaster recovery arrangements, our business could be harmed. Also, in the event of damage or interruption, our insurance policies may not adequately compensate us for any losses that we may incur. These factors in turn could further reduce our revenue, subject us to liability and cause us to issue credits or cause clients to fail to renew their subscriptions, any of which could materially adversely affect our business.

We provide service level commitments to our clients, and our failure to meet the stated service levels could significantly harm our revenue and our reputation.

Our client agreements provide that we maintain certain service level commitments to our clients relating primarily to product functionality, network uptime, critical infrastructure availability and hardware replacement. For example, our service level agreements generally require that our solutions are available 98% of the time during coverage hours (normally 6:00 a.m. though 10:00 p.m. Central time daily) 365 days per year (other than certain permitted exceptions such as maintenance). If we are unable to meet the stated service level commitments, we may be contractually obligated to provide clients with refunds or credits. Additionally, if we fail to meet our service level commitments a specified number of times within a given time frame or for a specified duration, our clients may terminate their agreements with us or extend the term of their agreements at no additional fee. As a result, a failure to deliver services for a relatively short duration could cause us to issue credits or refunds to a large number of affected clients or result in the loss of clients. In addition, we cannot assure that our clients will accept these credits, refunds, termination or extension rights in lieu of other legal remedies that may be available to them. Our failure to meet our commitments could also result in substantial client dissatisfaction or loss. Because of the loss of future revenues through the issuance of credits or the loss of clients or other potential liabilities, our revenue could be significantly impacted if we cannot meet our service level commitments to our clients.

We face intense competitive pressures and our failure to compete successfully could harm our business and operating results.

We compete in a number of markets including accounting software, property management software for multifamily, single family and commercial solutions, vertically-integrated cloud computing services, software-enabled value-added services including applicant screening, insurance, relationship management ("CRM"), marketing and web portals, Internet listing services, utility billing and energy management, revenue management, multifamily housing and commercial real estate market research, spend management, payment processing, affordable housing compliance and audit services and vacation rentals. The markets for many of our solutions are intensely competitive, fragmented and rapidly changing. Some of these markets have relatively low barriers to entry. With the introduction of new technologies and market entrants, we expect competition to intensify in the future. Increased competition could result in pricing pressures, reduced sales and reduced margins. Often we compete to sell our solutions against existing systems that our potential clients have already made significant expenditures to install.

Our competitors vary depending on our product and service. Certain competitors compete with us in a number of areas, including Yardi, Inc., Entrata, Inc., MRI Software LLC, AppFolio, Inc., and CoStar Group, Inc. Other competitors compete with us with respect to a single product or category of products. We compete in various markets, with different competitive considerations in these various markets. In many of our markets we compete with a number of providers, including those who market specifically to multifamily, single family, and commercial real estate owners and property managers as well as other providers. In addition, many of our existing or potential clients have developed or may develop their own solutions that may be competitive with our solutions. We also may face competition for potential acquisition targets from our competitors who are seeking to expand their offerings.

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With respect to all of our competitors, we compete based on a number of factors, including total cost of ownership, level of integration with property management systems, ease of implementation, product functionality and scope, performance, security, scalability and reliability of service, brand and reputation, sales and marketing capabilities and financial resources. Some of our existing competitors and new market entrants may enjoy substantial competitive advantages, such as greater name recognition, longer operating histories, larger installed client bases and larger sales and marketing budgets, as well as greater financial, technical and other resources. In addition, any number of our existing competitors or new market entrants could combine or consolidate, or obtain new financing through public or private sources, to become a more formidable competitor with greater resources. As a result of such competitive advantages, our existing and future competitors may be able to:

- develop superior products or services, gain greater market acceptance and expand their offerings more efficiently or more rapidly;
- adapt to new or emerging technologies and changes in client requirements more quickly;
- take advantage of acquisition and other opportunities more readily;
- adopt more aggressive pricing policies, such as offering discounted pricing for purchasing multiple bundled products;
- devote greater resources to the promotion of their brand and marketing and sales of their products and services; and
- devote greater resources to the research and development of their products and services.

If we are not able to compete effectively, our operating results will be harmed.

We integrate our software-enabled value-added services with competitive property management software for some of our clients. Our application infrastructure, marketed to our clients as SmartSource IT, is based on an open architecture that enables third-party applications to access and interface with applications hosted in SmartSource IT through our RealPage Exchange platform. Likewise, through this platform our SmartSource IT services are able to access and interface with other third-party applications, including third-party property management systems. We also provide services to assist in the implementation, training, support and hosting with respect to the integration of some of our competitors' applications with our solutions. We sometimes rely on the cooperation of our competitors to implement solutions for our clients. However, frequently our reliance on the cooperation of our competitors can result in delays in integration. There is no assurance that our competitors, even if contractually obligated to do so, will continue to cooperate with us or will not prospectively alter their obligations to do so. We also occasionally develop interfaces between our software-enabled value-added services and competitor property management software without their cooperation or consent. There is no assurance that our competitors will not alter their applications in ways that inhibit or prevent integration or assert that their intellectual property rights restrict our ability to integrate our solutions with their applications. Moreover, regardless of merit, such interface-related activity may result in costly litigation.

Material defects or errors in the software we use to deliver our solutions could harm our reputation, result in significant costs to us and impair our ability to sell our solutions.

The software applications underlying our solutions are inherently complex and may contain material defects or errors, particularly when first introduced or when new versions or enhancements are released. We have, from time to time, found defects in the software applications underlying our solutions, and new errors in our existing solutions may be detected in the future. Any errors or defects that cause performance problems or service interruptions could result in:

- a reduction in new sales or subscription renewal rates;
- unexpected sales credits or refunds to our clients, loss of clients and other potential liabilities;
- delays in client payments, increasing our collection reserve and collection cycle;
- diversion of development resources and associated costs;
- harm to our reputation and brand; and
- unanticipated litigation costs.

Additionally, the costs incurred in correcting defects or errors could be substantial and could adversely affect our operating results.

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Failure to effectively manage the development, sale and support of our solutions and data processing efforts outside the United States could harm our business.

Our success depends on our ability to process high volumes of client data, enhance existing solutions and develop new solutions rapidly and cost effectively. We currently maintain offices in Hyderabad, India; Cebu, Philippines and Manila, Philippines where we employ development and data processing personnel or conduct other business functions important to our operations. We believe that performing these activities in Hyderabad, Cebu and Manila increases the efficiency and decreases the costs of our related operations. We maintain an office in Barcelona, Spain where certain of our vacation rental product development, sales and support operations are based. We also maintain offices in London, England and Sydney, Australia, where we provide property management, online leasing and resident software solutions. We believe our access to a multilingual employee base enhances our ability to serve vacation and other rental property managers outside the United States and in non-English speaking countries. Managing and staffing international operations requires management’s attention and financial resources. The level of cost savings achieved by our international operations may not exceed the amount of investment and additional resources required to manage and operate these international operations. Our product offerings outside the United States may not be profitable or otherwise successful. Additionally, if we experience difficulties as a result of political, social, economic or environmental instability, change in applicable law, limitations of local infrastructure or problems with our workforce or facilities at our or third parties’ international operations, our business could be harmed due to delays in product release schedules or data processing services.

We rely on third-party technologies and services that may be difficult to replace or that could cause errors, failures or disruptions of our service, any of which could harm our business.

We rely on third-party providers in connection with the delivery of our solutions. Such providers include, but are not limited to, computer hardware and software vendors, database and data providers and cloud hosting providers. We utilize equipment, software and services from various third party providers. Our OneSite Accounting service relies on a software-as-a-service, or SaaS, accounting system developed and maintained by a third-party service provider. We host this application in our data centers and provide supplemental development resources to extend this accounting system to meet the unique requirements of the rental housing industry. Our shared cloud portfolio reporting service utilizes software licensed from a third party. We expect to utilize additional service providers as we expand our platform. Although the third-party technologies and services that we currently require are commercially available, such technologies and services may not continue to be available on commercially reasonable terms, or at all. Any loss of the right to use any of these technologies or services could result in delays in the provisioning of our solutions until alternative technology is either developed by us, or, if available, is identified, obtained and integrated, and such delays could harm our business. It also may be time consuming and costly to enter into new relationships. Additionally, any errors or defects in the third-party technologies we utilize or delays or interruptions in the third-party services we rely on could result in errors, failures or disruptions of our services, which also could harm our business.

We depend upon third-party service providers for important payment processing functions. If these third-party service providers do not fulfill their contractual obligations or choose to discontinue their services, our business and operations could be disrupted and our operating results would be harmed.

We rely on several large payment processing service providers to enable us to provide payment processing services to our clients, including electronic funds transfers, or EFT, check services, bank card authorization, data capture, settlement and merchant accounting services and access to various reporting tools. We and our clients also rely on third-party hardware manufacturers to manufacture the check scanning hardware which is utilized to process transactions. Some service providers are competitors who also directly or indirectly sell payment processing services to clients in competition with us. With respect to these service providers, we have significantly less control over the systems and processes than if we were to maintain and operate them ourselves. In some cases, functions necessary to our business are performed on proprietary third-party systems and software to which we have no access. We also generally do not have long-term contracts with these service providers. Accordingly, the failure of these organizations and service providers to renew their contracts with us or fulfill their contractual obligations and perform satisfactorily could result in significant disruptions to our operations and adversely affect operating results. In addition, the businesses we have acquired, or may acquire in the future, typically rely on other payment processing service providers. We may encounter difficulty converting payment processing services from these service providers to our payment processing platform. If we are required to find an alternative source for performing these functions, we may have to expend significant money, time and other resources to develop or obtain an alternative, and if developing or obtaining an alternative is not accomplished in a timely manner and without significant disruption to our business, we may be unable to fulfill our responsibilities to clients or meet their expectations, with the attendant potential for liability claims, damage to our reputation, and loss of ability to attract or maintain clients.

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If our security measures are breached and unauthorized access is obtained to our software platform, service infrastructure, or our clients' or their renters' or prospects' data, we may incur significant liabilities, third parties may misappropriate our intellectual property or financial assets, our solutions may be perceived as not being secure and clients may curtail or stop using our solutions.

Maintaining the security of our software platform and service infrastructure is of paramount importance to us and our clients, and we devote significant resources to this effort. Breaches of the security measures we take to protect our software platform and service infrastructure and our and our clients' confidential or proprietary information that is stored on and transmitted through those systems could disrupt and compromise the security of our internal systems and on demand applications, impair our ability to provide products and services to our clients and protect the privacy of their data, compromise our confidential or technical business information harming our competitive position, result in theft or misuse of our intellectual property or financial assets or otherwise adversely affect our business.

The solutions we provide involve the collection, storage and transmission of confidential personal and proprietary information regarding our clients and our clients' current and prospective renters and business partners. Specifically, we collect, store and transmit a variety of client data such as demographic information and payment histories of our clients' prospective and current renters and business partners. Additionally, we collect and transmit sensitive financial data such as credit card and bank account information. Treatment of certain types of data, such as personally identifiable information, protected health information and sensitive financial data may be subject to federal or state regulations requiring heightened privacy and security. If our data security or data integrity measures are breached or otherwise fail or prove to be inadequate for any reason, as a result of third-party actions or our employees' or contractors' errors or malfeasance or otherwise, and unauthorized persons obtain access to this information, or the data is otherwise compromised, we could incur significant liability to our clients and to their prospective or current renters or business partners, significant costs associated with internal regulatory investigations and litigation, or significant fines and sanctions by payment processing networks or governmental authorities. Any of these events or circumstances could result in damage to our reputation and material harm to our business.

We also rely upon our clients as users of our system to promote security of the system and the data within it, such as administration of client-side access credentialing and control of client-side display of data. On occasion, our clients have failed to perform these activities in such a manner as to prevent unauthorized access to data. To date, these breaches have not resulted in claims against us or in material harm to our business, but we cannot be certain that the failure of our clients in future periods to perform these activities will not result in claims against us, which could expose us to potential litigation, damage to our reputation and material harm to our business.

There can be no certainty that the measures we have taken to protect our software platform and service infrastructure, our confidential and proprietary information and the privacy and integrity of our clients', their current or prospective renters' and business partners' data are adequate to prevent or remedy unauthorized access to our system. Because techniques used to obtain unauthorized access to, or to sabotage, systems change frequently and generally are not recognized until launched against a target, we may be unable to anticipate these techniques or to implement adequate preventive measures. Experienced computer programmers seeking to intrude or cause harm, or hackers, have penetrated our service infrastructure in the past and are likely to attempt to do so in the future. Hackers may consist of sophisticated organizations, competitors, governments or individuals who launch targeted attacks to gain unauthorized access to our systems and financial assets. A hacker who is able to penetrate our service infrastructure could misappropriate proprietary or confidential information or financial assets or cause interruptions in our services. For example, during May 2018, as disclosed in our Form 10-Q for the quarter ended March 31, 2018, we were the subject of a targeted email phishing campaign that led to a business email compromise, pursuant to which an unauthorized party gained access to an external third party system used by a subsidiary that we acquired in 2017. The incident resulted in the diversion of approximately $6.0 million of funds, net of recoveries, intended for disbursement to three clients. Although we continue to vigorously pursue recovery of our losses and related expenses arising from this incident, there can be no assurance of recovery or of the timing of any such recovery.

We might be required to expend significant capital and resources to protect against, or to remedy, problems caused by hackers, and we may not have a timely remedy against a hacker who is able to penetrate our service infrastructure. In addition to purposeful breaches, inadvertent actions or the transmission of computer viruses could expose us to security risks. If an actual or perceived breach of our security occurs or if our clients and potential clients perceive vulnerabilities, the market perception of the effectiveness of our security measures could be harmed, we could lose sales and clients and our business could be materially harmed.

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Our business is subject to the risks of international operations.

Compliance with complex foreign and U.S. laws and regulations that apply to our international operations increases our cost of doing business. These numerous and sometimes conflicting laws and regulations include internal control and disclosure rules, data privacy and filtering requirements, anti-corruption laws, such as the Foreign Corrupt Practices Act, and other local laws prohibiting corrupt payments to governmental officials, and antitrust and competition regulations, among others.

Violations of these laws and regulations could result in fines and penalties, criminal sanctions against us, our officers, or our employees, prohibitions on the conduct of our business and on our ability to carry on operations in one or more countries, and could also materially affect our brand, our international expansion efforts, our ability to attract and retain employees, our business and our operating results. Although we have implemented policies and procedures designed to ensure compliance with these laws and regulations, there can be no assurance that our employees, contractors, or agents will not violate our policies.

In addition, we are subject to a variety of risks inherent in doing business internationally, including:

- political, social, economic or environmental instability, terrorist attacks and security concerns in general;
- limitations of local infrastructure;
- fluctuations in currency exchange rates;
- higher levels of credit risk and payment fraud;
- reduced protection for intellectual property rights in some countries;
- difficulties in staffing and managing global operations and the increased travel, infrastructure and legal compliance costs associated with multiple international locations;
- compliance with statutory equity requirements and management of tax consequences; and
- outbreaks of highly contagious diseases.

If we are unable to manage the complexity of our international operations successfully, our financial results could be adversely affected.

We rely on our management team and need additional personnel to grow our business, and the loss of one or more key employees or our inability to attract and retain qualified personnel could harm our business.

Our success and future growth depend on the skills, working relationships and continued services of our management team. The loss of our Chief Executive Officer or other senior executives, or our inability to successfully integrate certain new members of our management, could adversely affect our business. Our future success also will depend on our ability to attract, retain and motivate highly skilled software developers, marketing and sales personnel, technical support and product development personnel in the United States and internationally. All of our employees work for us on an at-will basis. Competition for these types of personnel is intense, particularly in the software industry. As a result, we may be unable to attract or retain qualified personnel. Our inability to attract and retain the necessary personnel could adversely affect our business.

Legal and Regulatory Risks Related to Our Business

We face a number of risks in our payment processing business that could result in a reduction in our revenues and profits.

In connection with our electronic payment processing services, we process renter payments and subsequently submit these renter payments to our clients after varying clearing times established by us. These payments are settled through our sponsor banks, and in the case of EFT, our Originating Depository Financial Institutions, or ODFIs. The renter payments that we process for our clients at our sponsor banks are identified in our Consolidated Balance Sheets as restricted cash and the corresponding liability for these renter payments is identified as client deposits. Our electronic payment processing business and related maintenance of custodial accounts subjects us to a number of risks, including, but not limited to:

- liability for client costs related to disputed or fraudulent transactions if those costs exceed the amount of the client reserves we have during the clearing period or after renter payments have been settled to our clients;

- electronic processing limits on the amount of custodial balances that any single ODFI, or collectively all of our ODFIs, will underwrite;
- reliance on sponsor banks, card payment processors and other payment service provider partners to process electronic transactions;
- failure by us or our sponsor banks to adhere to applicable laws and regulatory requirements or the standards of the electronic payments rules and regulations and other rules and regulations that may impact the provision of electronic payment services;

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- continually evolving laws and regulations governing payment processing and money transmission, the application or interpretation of which is not clear in some jurisdictions;
- incidences of fraud, a security breach or our failure to comply with required external audit standards;
- our inability to increase or modify our fees at times when sponsor banks, electronic payment partners or associations increase their transaction processing fees or impose restrictions on the type, structure or amount of fees we can charge;
- repricing actions taken by card associations or payment networks or imposed as a result of governmental regulation or due to competitive pressures, which could negatively impact the prices we can charge customers for our services; and
- inconsistent and conflicting laws, regulations and card association or payment network rules that may result in fee structures that cause consumer confusion, complaints or litigation.

If any of these risks related to our electronic payment processing business were to materialize, our business or financial results could be negatively affected. Although we attempt to structure and adapt our payment processing operations to comply with these complex and evolving laws and regulations, our efforts may not guarantee compliance. In the event that we are found to be in violation of these legal requirements, we may be subject to monetary fines, cease and desist orders, mandatory product changes, or other penalties that could have an adverse effect on our results of operations. Additionally, with respect to the processing of EFTs, we are exposed to financial risk and EFTs between a renter and our client may be returned for various reasons such as insufficient funds or stop payment orders. These returns are charged back to the client by us. However, if we or our sponsor banks are unable to collect such amounts from the client's account or if the client refuses or is unable to reimburse us for the chargeback, we bear the risk of loss for the amount of the transfer. While we have not experienced material losses resulting from chargebacks in the past, there can be no assurance that we will not experience significant losses from chargebacks in the future. Any increase in chargebacks not paid by our clients may adversely affect our financial condition and results of operations.

We entered into a service provider agreement with a financial institution merchant service provider under which we are a registered independent sales organization, or ISO, of the merchant service providers. The merchant service provider acts as a merchant acquiring bank for processing our client credit card and debit card payments ("Card Payments"), and we serve as an ISO. As an ISO, we assume the underwriting risk for processing Card Payments on behalf of our clients. If we experience excessive chargebacks, either we or the merchant service provider has the authority to cease client card processing services, and such events could result in a material adverse effect on our revenues, operating income, and reputation.

Evolution and expansion of our payment processing business may subject us to additional regulatory requirements and other risks, for which failure to comply or adapt could harm our operating results.

The evolution and expansion of our payment processing business may subject us to additional risks and regulatory requirements, including laws governing money transmission and payment processing/settlement services. These requirements vary throughout the markets in which we operate, and have increased over time as the geographic scope and complexity of our product services have expanded. While we maintain a compliance program focused on applicable laws and regulations throughout the payments industry, there is no guarantee that we will not be subject to fines, criminal and civil lawsuits or other regulatory enforcement actions in one or more jurisdictions, or be required to adjust business practices to accommodate future regulatory requirements.

In order to maintain flexibility in the growth and expansion of our payments operations, we have obtained money transmitter licenses (or their equivalents) in several states, the District of Columbia and Puerto Rico. Our efforts to maintain these licenses could result in significant management time, effort, and cost, and may still not guarantee compliance given the constant state of change in these regulatory frameworks. Accordingly, costs associated with changes in compliance requirements, regulatory audits, enforcement actions, reputational harm, or other regulatory limits on our ability to grow our payment processing business could adversely affect our financial results.

Because certain solutions we provide depend on access to client data, decreased access to this data or the failure to comply with the evolving laws and regulations governing privacy of data, cloud computing and cross-border data transfers, or the failure to address privacy concerns applicable to such data, could harm our business.

Certain of our solutions depend on our continued access to our clients' data regarding their prospective and current renters, including data compiled by other third-party service providers who collect and store data on behalf of our clients. Federal, state and foreign governments have adopted and continue to adopt new laws and regulations addressing data privacy and the collection, processing, storage, transmission, use and disclosure of personal information. Such laws and regulations are subject to differing interpretations and may be inconsistent among jurisdictions. These and other requirements could reduce demand for our solutions or restrict our ability to store and process data or, in some cases, impact our ability to offer our services and solutions in certain locations.

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In addition to government activity, privacy advocacy and other industry groups have established or may establish new self-regulatory standards that may place additional burdens on us. Our clients may expect us to meet voluntary certification or other standards established by third parties. If we are unable to maintain these certifications or meet these standards, it could adversely affect our ability to provide our solutions to certain clients and could harm our business.

Any restrictions on the use of or decrease in the availability of data from our clients, or other third parties that collect and store such data on behalf of our clients, and the costs of compliance with, and other burdens imposed by, applicable legislative and regulatory initiatives may limit our ability to collect, aggregate or use this data. Any limitations on our ability to collect, aggregate or use such data could reduce demand for certain of our solutions. Additionally, any inability to adequately address privacy concerns, even if unfounded, or comply with applicable privacy laws, regulations and policies, could result in liability to us or damage to our reputation and could inhibit sales and market acceptance of our solutions and harm our business.

Assertions by a third party that we infringe its intellectual property, whether successful or not, could subject us to costly and time-consuming litigation or expensive licenses.

The software and technology industries are characterized by the existence of a large number of patents, copyrights, trademarks and trade secrets and by frequent litigation based on allegations of infringement, misappropriation, misuse and other violations of intellectual property rights. We have received in the past, and may receive in the future, communications from third parties claiming that we have infringed or otherwise misappropriated the intellectual property rights or terms of use of others. Our technologies may not be able to withstand any third-party claims against their use. Since we currently have a limited number of patents, we may not be able to use patent infringement as a defensive strategy in such litigation. Additionally, although we have licensed from other parties proprietary technology covered by patents, we cannot be certain that any such patents will not be challenged, invalidated or circumvented. If such patents are invalidated or circumvented, this may allow existing and potential competitors to develop products and services that are competitive with, or superior to, our solutions.

Many of our client agreements require us to indemnify our clients for certain third-party claims, such as intellectual property infringement claims, which could increase our costs of defending such claims and may require that we pay damages if there were an adverse ruling or settlement related to any such claims. These types of claims could harm our relationships with our clients, may deter future clients from purchasing our solutions or could expose us to litigation for these claims. Even if we are not a party to any litigation between a client and a third party, an adverse outcome in any such litigation could make it more difficult for us to defend our intellectual property in any subsequent litigation in which we are a named party.

Litigation could force us to stop selling, incorporating or using our solutions that include the challenged intellectual property or redesign those solutions that use the technology. In addition, we may have to pay damages if we are found to be in violation of a third party's rights. We may have to procure a license for the technology, which may not be available on reasonable terms, if at all, may significantly increase our operating expenses or may require us to restrict our business activities in one or more respects. As a result, we may also be required to develop alternative non-infringing technology, which could require significant effort and expense. There is no assurance that we would be able to develop alternative solutions or, if alternative solutions were developed, that they would perform as required or be accepted in the relevant markets. In some instances, if we are unable to offer non-infringing technology, or obtain a license for such technology, we may be required to refund some or the entire license fee paid for the infringing technology by our clients.

Our exposure to risks associated with the use of intellectual property may be increased as a result of acquisitions, as we have a lower level of visibility into the development process with respect to acquired technology or the care taken to safeguard against infringement risks. Such risks include, without limitation, patent infringement risks, copyright infringement risks, risks arising from the inclusion of open source software that is subject to onerous license provisions that could even require disclosure of our proprietary source code, or violations of terms of use for third party solutions that our acquisition targets use. Third parties may make infringement and similar or related claims after we have acquired technology that had not been asserted prior to our acquisition.

Any failure to protect and successfully enforce our intellectual property rights could compromise our proprietary technology and impair our brands.

Our success depends on our ability to protect our proprietary rights to the technologies we use in our solutions. If we are unable to protect our proprietary rights adequately, our competitors could use the intellectual property we have developed to enhance their own products and services, which could harm our business. We rely on a combination of copyright, service mark, trademark and trade secret laws, as well as confidentiality procedures and contractual restrictions, to establish and protect our proprietary rights, all of which provide only limited protection. We currently have a limited number of issued patents and pending patent applications, and we may be unable to obtain patent protection in the future. In addition, if any patents are issued in the future, they may not provide us with any competitive advantages, may not be issued in a manner that gives us the protection that we seek and may be successfully challenged by third parties. Unauthorized parties may attempt to copy or otherwise obtain and use the technologies underlying our solutions. Monitoring unauthorized use of our technologies is difficult, and we do not know whether the steps we have taken will prevent unauthorized use of our technology. If we are unable to protect our proprietary rights, we may find ourselves at a competitive disadvantage to others who have not incurred the substantial expense, time and effort required to create similar innovative products.

We cannot assure that any future service mark or trademark registrations will be issued for pending or future applications or that any registered service marks or trademarks will be enforceable or provide adequate protection of our proprietary rights. If we are unable to secure new marks, maintain already existing marks and enforce the rights to use such marks against unauthorized third-party use, our ability to brand, identify and promote our solutions in the marketplace could be impaired, which could harm our business.

We customarily enter into agreements with our employees, contractors and certain parties with whom we do business to limit access to, use of, and disclosure of our confidential and proprietary information. The legal and technical steps we have taken, however, may not prevent unauthorized use or the reverse engineering of our technology. Moreover, we may be required to release the source code of our software to third parties under certain circumstances. For example, some of our client agreements provide that if we cease to maintain or support a certain solution without replacing it with a successor solution, then we may be required to release the source code of the software underlying such solution. In addition, others may independently develop technologies that are competitive to ours or infringe our intellectual property. Moreover, it may be difficult or practically impossible to detect copyright infringement or theft of our software code. Enforcement of our intellectual property rights also depends on our legal actions being successful against these infringers, but these actions may not be successful, even when our rights have been infringed. Furthermore, the legal standards relating to the validity, enforceability and scope of protection of intellectual property rights in Internet-related industries are uncertain and still evolving.

Additionally, as we sell our solutions internationally, effective patent, trademark, service mark, copyright and trade secret protection may not be available or as robust in every country in which our solutions are available. As a result, we may not be able to effectively prevent competitors outside the United States from infringing or otherwise misappropriating our intellectual property rights, which could reduce our competitive position and ability to compete or otherwise harm our business.

We may be unable to halt the operations of websites that aggregate or misappropriate data from our websites.

From time to time, third parties have misappropriated data from our websites through website scraping, software robots or other means and aggregated this data on their websites with data from other companies. In addition, copycat websites have misappropriated data on our network and attempted to imitate our brand or the functionality of our website. When we have become aware of such websites, we have employed technological or legal measures in an attempt to halt their operations. However, we may be unable to detect all such websites in a timely manner and, even if we could, technological and legal measures may be insufficient to halt their operations. In some cases, particularly in the case of websites operating outside of the United States, our available remedies may not be adequate to protect us against the impact of the operation of such websites. Regardless of whether we can successfully enforce our rights against the operators of these websites, any measures that we may take could require us to expend significant financial or other resources, which could harm our business, results of operations or financial condition. In addition, to the extent that such activity creates confusion among consumers or advertisers, our brand and business could be harmed.

Legal proceedings against us could be costly and time consuming to defend.

We are from time to time subject to legal proceedings and claims that arise in the ordinary course of business, including claims brought by our clients or vendors in connection with commercial disputes, claims brought by our clients’ current or prospective renters, including class action lawsuits based on asserted statutory or regulatory violations, employment-based claims made by our current or former employees, and other claims brought by administrative agencies, government regulators, or insurers.

As previously disclosed, in March 2015, we were named in a purported class action lawsuit in the United States District Court for the Eastern District of Pennsylvania, styled Stokes v. RealPage, Inc., Case No. 2:15-cv-01520. The claims in this purported class action relate to alleged violations of the Fair Credit Reporting Act (“FCRA”) in connection

with background screens of prospective tenants of our clients.
As previously disclosed, in November 2014, we were named in a purported class action lawsuit in the United States District Court for the Eastern District of Virginia, styled Jenkins v. RealPage, Inc., Case No. 3:14cv758. The claims in this purported class action relate to alleged violations of the FCRA in connection with background screens of prospective tenants of our clients.
Following various procedural motions, on June 19, 2017, the court in both the Stokes case and Jenkins case consolidated the cases, for purposes of settlement. On June 30, 2017, the parties signed a Settlement Agreement and Release covering both cases, and the plaintiffs in the consolidated cases filed an uncontested motion for preliminary approval of the class action settlement and the notice to the class. On August 3, 2017, the court issued a written order preliminarily approving the proposed

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class settlement. Following the final approval hearing on February 6, 2018, the court entered an order granting final approval of the settlement.

On February 23, 2015, we received from the Federal Trade Commission ("FTC") a Civil Investigative Demand consisting of interrogatories and a request to produce documents relating to our compliance with the FCRA. We responded to the request and requests for additional information by the FTC. On November 2, 2017, the FTC staff informed us of its belief that there was a basis for claims that could include monetary and injunctive relief against us for failing to follow reasonable procedures to assure maximum possible accuracy of our tenant screening reports. We believe that our business practices did not, and do not, violate the FCRA or any other laws.

In October 2018, we reached a settlement with the FTC resolving all issues raised by the FTC related to this matter. Under the settlement, we paid $3.0 million to the FTC and agreed to continue to comply with the FCRA. The settlement does not require any changes to our current business practices.

Litigation, enforcement actions and other legal proceedings, regardless of their outcome, may result in substantial costs and may divert management's attention and our resources, which may harm our business, overall financial condition and operating results. In addition, legal claims that have not yet been asserted against us may be asserted in the future. Although we maintain insurance, there is no guarantee that such insurance will be available or sufficient to cover any such legal proceedings or claims. For example, insurance may not cover such legal proceedings or claims or the insurer may withhold or dispute coverage of such legal proceedings or claims on various grounds, including by alleging such coverage is beyond the scope of such policies, that we are not in compliance with the terms of such insurance policies or that such policies are not in effect, even after proceeds under such insurance policies have been received by us. We are currently involved in discussions with our insurance carrier regarding coverage for a May 2018 targeted email phishing incident that led to a business email compromise and the diversion of funds totaling approximately $6.0 million, net of recoveries, that were intended for disbursement to three of our clients. The insurance carrier made payment on a portion of our claim in January 2019, and while there can be no assurance of the final outcome, we intend to vigorously pursue repayment of the remaining losses. See Item 7. Management Discussion and Analysis of Financial Condition and Results of Operations - Recent Developments - Other Events for additional details. Insurance may not be sufficient for one or more such legal proceedings or claims and may not continue to be available on terms acceptable to us, or at all. A legal proceeding or claim brought against us that is uninsured or under-insured could result in unanticipated costs, thereby harming our operating results.

We could be sued for contract, warranty or product liability claims, and such lawsuits may disrupt our business, divert management's attention and our financial resources or have an adverse effect on our financial results.

We provide warranties to clients of certain of our solutions and services relating primarily to product functionality, network uptime, critical infrastructure availability and hardware replacement. General errors, defects, inaccuracies or other performance problems in the software applications underlying our solutions or inaccuracies in or loss of the data we provide to our clients could result in financial or other damages to our clients. Additionally, errors associated with any delivery of our services, including utility billing, could result in financial or other damages to our clients. There can be no assurance that any warranty disclaimers, general disclaimers, waivers or limitations of liability set forth in our contracts would be enforceable or would otherwise protect us from liability for damages. We maintain general liability insurance coverage, including coverage for errors and omissions, in amounts and under terms that we believe are appropriate. There can be no assurance that this coverage will continue to be available on terms acceptable to us, or at all, or in sufficient amounts to cover one or more claims, or that the insurer will not deny coverage for any future claim or dispute coverage of such legal proceedings or claims even after proceeds under such insurance policies have been received by us. The successful assertion of one or more claims against us that exceeds available insurance coverage, could have a material adverse effect on our business, prospects, financial condition and results of operations.

The rental housing industry, electronic commerce and many of the products and services that we offer, including background screening services, utility billing, affordable housing compliance and audit services, insurance and payments are subject to extensive and evolving governmental regulation. Changes in regulations or our failure to comply with regulations could harm our operating results.

The rental housing industry is subject to extensive and complex federal, state and local laws and regulations. Our services and solutions must work within the extensive and evolving legal and regulatory requirements applicable to us, our clients or our third-party service providers, including, but not limited to, those under the Fair Credit Reporting Act, the Fair Housing Act, the Deceptive Trade Practices Act, the Drivers Privacy Protection Act, the Gramm-Leach-Bliley Act, the Fair and Accurate Credit Transactions Act, the United States Tax Reform Act of 1986 (TRA86), which is an IRS law governing tax credits, the Privacy Rules, Safeguards Rule and Consumer Report Information Disposal Rule promulgated by the Federal Trade Commission, or FTC, the FTC’s Telemarketing Sales Rule, the Telephone Consumer Protection Act (TCPA), the CAN-SPAM Act, the Electronic Communications Privacy Act, the regulations of the United States Department of Housing and Urban Development, or HUD, HIPAA/HITECH, rules and regulations of the Consumer Financial Protection Bureau (CFPB), the Americans with Disabilities Act, and complex and divergent state and local laws and regulations related to data privacy and security, credit and

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consumer reporting, deceptive trade practices, discrimination in housing, telemarketing, electronic communications, call recording, utility billing and energy and gas consumption. These regulations are complex, change frequently and may become more stringent over time. Although we attempt to structure and adapt our solutions and service offerings to comply with these complex and evolving laws and regulations, we may be found to be in violation. If we are found to be in violation of any applicable laws or regulations, we could be subject to administrative and other enforcement actions as well as class action lawsuits or demands for client reimbursement. Additionally, many applicable laws and regulations provide for penalties or assessments on a per occurrence basis. Due to the nature of our business, the type of services we provide and the large number of transactions processed by our solutions, our potential liability in an enforcement action or class action lawsuit could be significant. In addition, entities such as HUD, the FTC and the CFPB have the authority to promulgate rules and regulations that may impact us, our clients and our business.

On February 23, 2015, we received from the FTC a Civil Investigative Demand consisting of interrogatories and a request to produce documents relating to our compliance with the FCRA. We responded to the request and requests for additional information by the FTC. On November 2, 2017, the FTC staff informed us of its belief that there was a basis for claims that could include monetary and injunctive relief against us for failing to follow reasonable procedures to assure maximum possible accuracy of our tenant screening reports. We believe that our business practices did not, and do not, violate the FCRA or any other laws.

In October 2018, we reached a settlement with the FTC resolving all issues raised by the FTC related to this matter. Under the settlement, we paid $3.0 million to the FTC and agreed to continue to comply with the FCRA. The settlement does not require any changes to our current business practices.

We believe increased regulation is likely in the area of data privacy, and laws and regulations applying to the solicitation, collection, processing or use of personally identifiable information or consumer information could affect our and our clients' ability to use and share data, potentially reducing demand for our on demand software solutions. In October 2015, the European Court of Justice invalidated the U.S.-EU Safe Harbor framework, which had been the primary compliance mechanism for establishing data transfers outside of the European Economic Area in accordance with the European Union's Data Protection Directive 95-46 EC. In July 2016, the U.S. and European Union entered into a new compliance framework, (the "Privacy Shield"), which was intended to replace the U.S.-EU Safe Harbor framework. The Privacy Shield is subject to review by European courts, and this creates some uncertainty regarding compliance with applicable privacy laws and regulations. While alternative compliance options exist, the long-term viability of the overall compliance framework remains in question, which could result in increased regulation, cost of compliance and limitations on data transfers for both our clients and us. In May 2018, the General Data Protection Regulation ("GDPR") became effective in the European Union, and imposed new requirements and restrictions upon companies that process personal data of EU citizens. In June 2018, the State of California passed the California Consumer Privacy Act ("CCPA"), which creates new requirements and restrictions for processing personal data of California citizens beginning January 1, 2020. If we are unable to meet the requirements of applicable privacy laws and regulations, the Privacy Shield, GDPR or CCPA with respect to our services subject to these provisions, we may incur monetary or other penalties which could harm our business or financial condition.

Some of our LeaseStar products operate under the real estate brokerage laws of numerous states and require maintaining licenses in many of these states. Brokerage laws in these states could change, affecting our ability to provide some LeaseStar or, if applicable, other products in these states.

We deliver our on demand software solutions over the Internet and sell and market certain of our solutions over the Internet. As Internet commerce continues to evolve, increasing regulation by federal, state or foreign agencies becomes more likely. Taxation of products or services provided over the Internet or other charges imposed by government agencies or by private organizations for accessing the Internet may also be imposed. Any regulation imposing greater fees for Internet use or restricting information exchange over the Internet could result in a decline in the use of the Internet and the viability of on demand software solutions, which could harm our business and operating results.

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Our LeasingDesk insurance business is subject to governmental regulation which could reduce our profitability or limit our growth.

Through our wholly owned subsidiaries, we hold insurance agent licenses from a number of individual state departments of insurance and are subject to state governmental regulation and supervision in connection with the operation of our LeasingDesk insurance business. In addition, we have appointed numerous sub-producing agents to generate insurance business for its eRenterPlan product. These sub-producing agents primarily consist of property owners and managers who market the eRenterPlan to residents. The sub-producing agents are subject to the same state regulation and supervision, and we cannot ensure that these sub-producing agents will not violate these regulations, and thus expose the LeasingDesk business to sanctions by these state departments of insurance for any such violations. Furthermore, state insurance departments conduct periodic examinations, audits and investigations of the affairs of insurance agents. This state governmental supervision could reduce our profitability or limit the growth of our LeasingDesk insurance business by increasing the costs of regulatory compliance, limiting or restricting the solutions we provide or the methods by which we provide them or subjecting us to the possibility of regulatory actions or proceedings. Our continued ability to maintain these insurance agent licenses in the jurisdictions in which we are licensed depends on our compliance with the rules and regulations promulgated from time to time by the regulatory authorities in each of these jurisdictions.

In all jurisdictions, the applicable laws and regulations are subject to amendment or interpretation by regulatory authorities. Generally, such authorities are vested with relatively broad discretion to grant, renew and revoke licenses and approvals and to implement regulations, as well as regulate rates that may be charged for premiums on policies. Accordingly, we may be precluded or temporarily suspended from carrying on some or all of the activities of our LeasingDesk insurance business or fined or penalized in a given jurisdiction. No assurances can be given that our LeasingDesk insurance business can continue to be conducted in any given jurisdiction as it has been conducted in the past.

We are required to maintain a 50-state general agency insurance license as well as individual insurance licenses for each sales agent involved in the solicitation of insurance products. Both the agency and individual licenses require compliance with state insurance regulations, payment of licensure fees, and continuing education programs. In the event that regulatory compliance requirements are not met, we could be subject to license suspension or revocation, state Department of Insurance audits and regulatory fines. As a result, our ability to engage in the business of insurance could be restricted, and our revenue and financial results will be adversely affected.

Risks Related to Ownership of our Common Stock

The concentration of our capital stock owned by insiders may limit your ability to influence corporate matters.

Our executive officers, directors, and entities affiliated with them together beneficially owned approximately 17.9% of our common stock as of December 31, 2018. Of such amount, Stephen T. Winn, our President, Chief Executive Officer and Chairman of the Board, and entities beneficially owned by Mr. Winn held an aggregate of approximately 16.4% of our common stock as of December 31, 2018. Beneficial ownership is determined in accordance with the rules of the SEC. The number of shares of common stock deemed outstanding includes all shares of restricted stock and those shares issuable upon exercise of options that may be exercised within 60 days after December 31, 2018. The significant concentration of ownership may adversely affect the trading price of our common stock because investors often perceive disadvantages in owning stock in companies with controlling stockholders. Mr. Winn and entities beneficially owned by Mr. Winn may exert significant influence over our management and affairs and matters requiring stockholder approval, including the election of directors and the approval of significant corporate transactions, such as mergers, consolidations or the sale of substantially all of our assets. Consequently, this concentration of ownership may have the effect of delaying or preventing a change of control, including a merger, consolidation or other business combination involving us, or discouraging a potential acquirer from making a tender offer or otherwise attempting to obtain control, even if that change of control would benefit our other stockholders.

The trading price of our common stock may be volatile.

The trading price of our common stock could be subject to wide fluctuations in response to various factors, including, but not limited to, those described in this "Risk Factors" section, some of which are beyond our control. Factors affecting the trading price of our common stock include:

- variations in our operating results or in expectations regarding our operating results;
- variations in operating results of similar companies;
- changes in our financial guidance and how our actual results compare to such guidance;
- changes in the estimates of our operating results or changes in recommendations by any research analysts that elect to follow our common stock;
- announcements of technological innovations, new solutions or enhancements, acquisitions, strategic alliances or agreements by us or by our competitors;

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- announcements by competitors regarding their entry into new markets, and new product, service and pricing strategies;
- marketing, advertising or other initiatives by us or our competitors;
- increases or decreases in our sales of products and services for use in the management of units by clients and increases or decreases in the number of units managed by our clients;
- threatened or actual litigation;
- major changes in our board of directors or management;
- recruitment or departure of key personnel;
- market conditions in our industry and the economy as a whole;
- the overall performance of the equity markets;
- sales of our shares of common stock by existing stockholders;
- volatility in our stock price, which may lead to higher stock-based expense under applicable accounting standards; and
- adoption or modification of regulations, policies, procedures or programs applicable to our business.

In addition, the stock market in general, and the market for technology and specifically Internet-related companies, has experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of those companies. Broad market and industry factors may harm the market price of our common stock regardless of our actual operating performance. In addition, in the past, following periods of volatility in the overall market and the market price of a particular company's securities, securities class action litigation has often been instituted against these companies. This litigation, if instituted against us, could result in substantial costs and a diversion of our management's attention and our resources, whether or not we are successful in such litigation.

Future sales of our common stock in the public market could lower the market price for our common stock.

In the future, we may sell additional shares of our common stock to raise capital. On June 5, 2018, we amended our certificate of incorporation to increase the number of authorized shares of common stock by 125,000,000 shares, bringing the total authorized shares of common stock to 250,000,000. In addition, on May 29, 2018, we consummated an underwritten public offering of 8.05 million shares of our common stock, with total gross proceeds raised of $458.9 million. A substantial number of shares of our common stock is reserved for issuance upon the exercise of stock options and upon conversion of the Convertible Notes. We cannot predict the size of future issuances or the effect, if any, that they may have on the market price for our common stock. The issuance and sale of substantial amounts of common stock, or the perception that such issuances and sales may occur, could adversely affect the market price of our common stock and impair our ability to raise capital through the sale of additional equity.

The Note Hedges and Warrant transactions may affect the value of our common stock.

In connection with the pricing of the Convertible Notes, we entered into Note Hedges transactions with the option counterparties. We also entered into Warrant transactions with the option counterparties. The Note Hedges transactions are expected generally to reduce the potential dilution upon conversion of the Convertible Notes and/or offset any cash payments we are required to make in excess of the principal amount of Convertible Notes once converted, as the case may be. However, the Warrants could separately have a dilutive effect on our common stock to the extent that the market price per share of our common stock exceeds the strike price of the Warrants.

In connection with establishing their initial hedges of the Note Hedges and Warrants, the option counterparties or their respective affiliates expected to enter into various derivative transactions with respect to our common stock concurrently with or shortly after the pricing of the Convertible Notes. The option counterparties or their respective affiliates may modify any such hedge positions by entering into or unwinding various derivatives with respect to our common stock and/or purchasing or selling our common stock or other securities of ours in secondary market transactions prior to the maturity of the Convertible Notes (and are likely to do so during any observation period related to a conversion of the Convertible Notes). This activity could also cause or avoid an increase or a decrease in the market price of our common stock.

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Our charter documents and Delaware law could prevent a takeover that stockholders consider favorable and could also reduce the market price of our stock.
Our amended and restated certificate of incorporation and our amended and restated bylaws contain provisions that could delay or prevent a change in control of our company. These provisions could also make it more difficult for stockholders to elect directors and take other corporate actions. These provisions include:
- a classified board of directors whose members serve staggered three-year terms;
- not providing for cumulative voting in the election of directors;
- authorizing our board of directors to issue, without stockholder approval, preferred stock with rights senior to those of our common stock;
- prohibiting stockholder action by written consent; and
- requiring advance notification of stockholder nominations and proposals.

These and other provisions of our amended and restated certificate of incorporation and our amended and restated bylaws and under Delaware law could discourage potential takeover attempts, reduce the price that investors might be willing to pay in the future for shares of our common stock and result in the market price of our common stock being lower than it would be without these provisions.
If securities analysts do not continue to publish research or reports about our business or if they publish negative evaluations of our stock, the price of our stock could decline.
We expect that the trading price for our common stock may be affected by research or reports that industry or financial analysts publish about us or our business. If one or more of the analysts who cover us downgrade their evaluations of our stock, the price of our stock could decline. If one or more of these analysts cease coverage of our company, we could lose visibility in the market for our stock, which in turn could cause our stock price to decline.
We do not anticipate paying any cash dividends on our common stock.
We do not anticipate paying any cash dividends on our common stock in the foreseeable future. If we do not pay cash dividends, you would receive a return on your investment in our common stock only if the market price of our common stock has increased when you sell your shares. In addition, the terms of our credit facilities currently restrict our ability to pay dividends. See additional discussion under the Dividend Policy heading of Part II, Item 5 of our Annual Report on Form 10-K.
Item 1B. Unresolved Staff Comments.
None.
Item 2. Properties.
At December 31, 2018, we leased approximately 457,000 square feet of space for our corporate headquarters in Richardson, Texas under a lease agreement that expires in August 2028. We also have offices in Campbell, California; Costa Mesa, California; Irvine, California; Manhattan Beach, California; Sacramento, California; San Diego, California; Broomfield, Colorado; Tampa, Florida; Alpharetta, Georgia; Duluth, Georgia; Lombard, Illinois; Ann Arbor, Michigan; Bloomington, Minnesota; Hackensack, New Jersey; New York, New York; Mason, Ohio; Greenville, South Carolina; Dallas, Texas; Richardson, Texas; South Burlington, Vermont; Hyderabad, India; Cebu, Philippines; Manila, Philippines; Barcelona, Spain; and London, United Kingdom. We also license data center space and employ the services of cloud service providers at multiple locations in the U.S. and internationally. We believe our current and planned office and data center facilities will be adequate for the foreseeable future.
Item 3. Legal Proceedings.
On February 23, 2015, we received from the FTC a Civil Investigative Demand consisting of interrogatories and a request to produce documents relating to our compliance with the Fair Credit Reporting Act (“FCRA”). We responded to the request and requests for additional information by the FTC. On November 2, 2017, the FTC staff informed us of its belief that there was a basis for claims that could include monetary and injunctive relief against us for failing to follow reasonable procedures to assure maximum possible accuracy of our tenant screening reports. We believe that our business practices did not, and do not, violate the FCRA or any other laws.

In October 2018, we reached a settlement with the FTC resolving all issues raised by the FTC related to this matter. Under the settlement, we paid $3.0 million to the FTC and agreed to continue to comply with the FCRA. The settlement does not require any changes to our current business practices.

We are subject to legal proceedings and claims arising in the ordinary course of business. We are involved in litigation and other legal proceedings and claims, including purported class action lawsuits, that have not been fully resolved. At this time, we believe that any reasonably possible adverse outcome of such matters would not be material either individually or in

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the aggregate. Our view of these matters may change in the future as litigation and events related thereto unfold. See the risk factors “Assertions by a third party that we infringe its intellectual property, whether successful or not, could subject us to costly and time-consuming litigation or expensive licenses,” “The rental housing industry, electronic commerce and many of the products and services that we offer, including background screening services, utility billing, affordable housing compliance and audit services, insurance and payments are subject to extensive and evolving governmental regulation. Changes in regulations or our failure to comply with regulations could harm our operating results,” and “Legal proceedings against us could be costly and time consuming to defend” in Part I, Item 1A of this Form 10-K under the heading “Risk Factors.”

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 and Holders

Our common stock is traded on the NASDAQ Global Select Market under the symbol “RP.” As of February 15, 2019, there were approximately 302 holders of record of our common stock. Restricted shares granted under our stock-based expense plans which have not yet vested are considered to be held by one holder. Because many of our shares of common stock are held by brokers and other institutions on behalf of stockholders, the number of record holders of our shares is not indicative of the total number of stockholders.

Performance Graph

The following graph compares the relative performance of our common stock, the NASDAQ Global Market Index, NASDAQ Composite, and the NASDAQ Computer and Data Processing Index. This graph covers the annual periods ending December 31, 2013 through December 31, 2018. In each case, this graph assumes a $100 investment on the last trading day of the fiscal year ended December 31, 2013 (and reinvestment of all dividends, if any), in each of our common stock, the NASDAQ Global Market Index, NASDAQ Composite, and the NASDAQ Computer and Data Processing Index.

	December 31, 2013	December 31, 2014	December 31, 2015	December 31, 2016	December 31, 2017	December 31, 2018
RealPage, Inc.	$ 100.00	$ 93.93	$ 96.02	$ 128.31	$ 189.48	$ 206.12
NASDAQ Composite—Total Returns	100.00	114.75	122.74	133.62	173.22	168.30
NASDAQ Global Market Index	100.00	106.01	106.00	101.91	127.16	148.17
NASDAQ Computer and Data Processing Index	100.00	106.92	140.18	152.41	214.71	236.87

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Issuer Purchases of Equity Securities

The following table provides information with respect to repurchases of our common stock made during the fourth quarter of 2018 by RealPage, Inc. or any "affiliated purchaser" of RealPage, Inc. as defined in Rule 10b-18(a)(3) under the Exchange Act:

Period	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs [(1)]	Approximate Dollar Value of Shares that May Yet Be Purchased Under the Plans or Programs [(1)]
October 1, 2018 through October 31, 2018	—	$ —	—	$ 100,000,000
November 1, 2018 through November 30, 2018	449,664	46.99	449,664	78,869,061
December 1, 2018 through December 31, 2018	150,000	46.34	150,000	71,917,676
Total	599,664	$ 46.83	599,664	$ 71,917,676

(1) In October 2018, our board of directors approved a new share repurchase program authorizing the repurchase of up to $100.0 million of our outstanding common stock. The share repurchase program is effective through October 25, 2019.

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Item 6. Selected Financial Data.

The following selected financial data is derived from our audited Consolidated Financial Statements. Over the last five fiscal years, we have acquired a number of companies as disclosed in Note 3 “Acquisitions” of the Notes to Consolidated Financial Statements under Item 8 of this Annual Report on Form 10-K. The results of our acquired companies have been included in our Consolidated Financial Statements since their respective dates of acquisition and have contributed to the growth in our results of operations. This information should be read in conjunction with our audited Consolidated Financial Statements, the related notes, and the information in Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” and included elsewhere in this Annual Report on Form 10-K. Our historical results are not necessarily indicative of our future results.

Amounts presented below reflect the correction of an immaterial error related to the misclassification of amortization expense on certain acquired intangible assets. Additionally, the amounts below reflect a change in presentation of our Consolidated Statements of Operations to add “Amortization of product technologies” and “Amortization of intangible assets” as separate line items within such statements. Refer to Note 2 of the accompanying Consolidated Financial Statements for further discussion of these items.

	Year Ended December 31,				
	2018	2017	2016	2015	2014
	(in thousands, except per share data)				
Revenue:					
On demand	$833,709	$642,622	$542,531	$450,962	$390,622
Professional and other	35,771	28,341	25,597	17,558	13,929
Total revenue	869,480	670,963	568,128	468,520	404,551
Cost of revenue	328,382	258,135	225,539	184,400	164,159
Amortization of product technologies	35,797	22,163	17,669	14,213	10,712
Gross profit	505,301	390,665	324,920	269,907	229,680
Operating expenses:					
Product development	118,525	89,452	73,607	68,799	64,418
Sales and marketing	163,887	140,473	121,707	111,944	99,870
General and administrative	118,208	112,975	85,013	68,814	69,202
Amortization of intangible assets	35,911	17,755	12,599	11,164	11,693
Impairment of intangible assets	2,720	—	750	20,801	—
Total operating expenses	439,251	360,655	293,676	281,522	245,183
Operating income (loss)	66,050	30,010	31,244	(11,615)	(15,503)
Interest expense and other, net	(31,750)	(14,769)	(3,758)	(1,449)	(1,104)
Income (loss) before income taxes	34,300	15,241	27,486	(13,064)	(16,607)
Income tax (benefit) expense	(425)	14,864	10,836	(3,846)	(6,333)
Net income (loss)	$34,725	$377	$16,650	$(9,218)	$(10,274)
Net income (loss) per share attributable to common stockholders:					
Basic	$0.40	$0.00	$0.22	$(0.12)	$(0.13)
Diluted	$0.38	$0.00	$0.21	$(0.12)	$(0.13)
Weighted average common shares outstanding:					
Basic	87,290	79,433	76,854	76,689	76,991
Diluted	91,531	82,398	77,843	76,689	76,991

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	Year Ended December 31,				
	2018	2017	2016	2015	2014
	(in thousands, except client and employee data)				
Consolidated Balance Sheet Data:					
Cash and cash equivalents[1]	$228,159	$69,343	$104,886	$30,911	$26,936
Total current assets	$540,753	$308,579	$297,455	$221,943	$186,819
Total assets	$2,097,773	$1,516,293	$788,098	$623,201	$566,294
Total current liabilities	$412,232	$332,907	$250,527	$215,347	$196,709
Total deferred revenue	$125,606	$122,160	$95,891	$91,179	$80,388
Current and long-term debt[2]	$596,572	$648,818	$122,429	$40,292	$20,866
Total liabilities	$1,034,749	$1,014,418	$403,335	$296,749	$237,514
Total stockholders' equity	$1,063,024	$501,875	$384,763	$326,452	$328,780
Other Financial Data:					
Adjusted EBITDA[3]	$231,176	$163,445	$127,210	$92,191	$70,589
Operating cash flow	$244,807	$140,263	$129,449	$95,930	$83,574
Capital expenditures	$50,933	$49,752	$75,241	$33,384	$37,062
Selected Operating Data:					
Number of on demand clients at period end	12,266	12,414	11,042	11,998	10,744
Number of on demand units at period end	16,219	13,003	10,989	10,568	9,560
Total number of employees at period end	6,267	5,462	4,410	4,122	3,875

(1) Excludes restricted cash.

(2) Includes capital lease obligations.

(3) A definition of this non-GAAP financial measure and a discussion of our use of it is included in Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations," in this Annual Report on Form 10-K.

The following table presents a reconciliation of net income (loss) to Adjusted EBITDA:

	Year Ended December 31,				
	2018	2017	2016	2015	2014
	(in thousands)				
Net income (loss)	$34,725	$377	$16,650	$(9,218)	$(10,274)
Acquisition-related and other deferred revenue adjustments	1,890	3,058	(949)	(2,157)	435
Depreciation, asset impairment, and loss on disposal of assets	35,211	27,752	25,813	44,385	19,288
Amortization of product technologies and intangible assets	71,708	39,918	30,268	25,377	22,404
Loss due to cyber incident, net of recoveries	4,952	—	—	—	—
Acquisition-related expense (income)	2,437	5,557	363	(1,841)	1,987
Costs related to the Hart-Scott-Rodino review process	78	11,012	—	—	—
Interest expense, net	29,959	15,072	3,825	1,367	1,117
Income tax (benefit) expense	(425)	14,864	10,836	(3,846)	(6,333)
Litigation-related expense	—	—	—	2	4,915
Headquarters relocation costs	—	—	3,552	—	—
Stock-based expense	50,641	45,835	36,852	38,122	37,050
Adjusted EBITDA	$231,176	$163,445	$127,210	$92,191	$70,589

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

The following discussion and analysis of our financial condition and results of operations should be read together with "Selected Financial Data" and our audited Consolidated Financial Statements and accompanying notes included elsewhere in this filing. This discussion contains forward-looking statements, based on current expectations and related to our plans, estimates, beliefs, and anticipated future financial performance. These statements involve risks and uncertainties, and our actual results may differ materially from those anticipated in these forward-looking statements as a result of many factors, including those set forth under "Risk Factors," "Special Note Regarding Forward-Looking Statements," and elsewhere in this filing.

Overview

We are a leading global provider of software and data analytics to the real estate industry. Clients use our platform of solutions to improve operating performance and increase capital returns. By leveraging data as well as integrating and streamlining a wide range of complex processes and interactions among the rental real estate ecosystem, our platform helps our clients improve financial and operational performance and prudently place and harvest capital.

The substantial majority of our revenue is derived from sales of our on demand software solutions, representing 95.9%, 95.8%, and 95.5% of our total revenue during 2018, 2017, and 2016, respectively. We also derive revenue from our professional and other services, and a small percentage of our revenue is derived from sales of our on premise software solutions. Our on demand software solutions are sold pursuant to subscription license agreements, and our on premise software solutions are sold pursuant to term or perpetual licenses and associated maintenance agreements. For our insurance-based solutions, we earn revenue based on a commission rate that considers earned premiums, agent commission, incurred losses, and profit retained by our underwriting partner. Our transaction-based solutions are priced based on a fixed rate per transaction. We sell our solutions through our direct sales organization and derive substantially all of our revenue from sales in the United States. Our revenue has increased from $671.0 million in 2017 to $869.5 million in 2018. The increase in revenue was driven by incremental revenue from our recent acquisitions and growth in the sales of our on demand software solutions.

We believe there is increasing demand for solutions that bring efficiency and precision to the rental real estate industry, which has historically lacked the tools available to many other investment classes. While the use of, and transition to, data analytics and on demand software solutions in the rental real estate industry is growing rapidly, we believe it remains at a relatively early stage of adoption. Additionally, there is a modest level of penetration of our on demand software solutions in our existing client base. These factors present us with significant opportunities to generate revenue through sales of additional data analytics and on demand software solutions.

Our company was formed in 1998 to acquire Rent Roll, Inc., which marketed and sold on premise property management systems for the conventional and affordable multifamily rental housing markets. In June 2001, we released OneSite, our first on demand property management system. Since 2002, we have expanded our platform of solutions to include property management, leasing and marketing, resident services, and asset optimization capabilities. In addition to the multifamily markets, we now serve the single family, senior living, student living, military housing, commercial, hospitality, homeowner association, short-term rental and vacation rental markets. Since July 2002, we have completed over 40 acquisitions of complementary technologies to supplement our internal product development and sales and marketing efforts and expand the scope of our solutions, the types of rental housing and vacation rental properties served by our solutions, and our client base. In connection with this expansion and these acquisitions, we have committed greater resources to developing and increasing sales of our platform of data analytics and on demand solutions. As of December 31, 2018, we had approximately 6,200 employees.

Recent Developments

Credit Facility

In March 2018, we executed the Seventh Amendment to our 2014 Credit Facility. This amendment allowed for an increase of $150.0 million in available credit under our Revolving Facility, to a total aggregate commitment for revolving loans up to $350.0 million. Among other modifications, the Seventh Amendment provided for an increase in the maximum Net Leverage Ratio and Senior Leverage Ratio to 5.00 to 1.00 and 3.75 to 1.00, respectively. The Seventh Amendment also replenished the Accordion Feature to allow us, subject to certain conditions, to request additional term loans or revolving commitments up to an aggregate principal amount of $150.0 million, plus an amount that would not cause our Senior Leverage Ratio to exceed 3.50 to 1.00.
Refer to Note 8 of the accompanying Consolidated Financial Statements for applicable definitions, further discussion of this amendment, and other terms and conditions of the Credit Facility.

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Public Offering
On May 29, 2018, we consummated an underwritten public offering of 8.05 million shares of our common stock, which included 1.05 million shares sold pursuant to the underwriters' full exercise of their option to purchase additional shares. The offering was priced at $57.00 per share for total gross proceeds of $458.9 million. The aggregate net proceeds to us were $441.9 million, after deducting underwriting discounts and offering expenses in the aggregate amount of $16.9 million. The offering was made pursuant to an effective shelf registration statement filed with the SEC on May 21, 2018.
Acquisition Activity
Rentlytics
In October 2018, we entered into an agreement and plan of merger whereby we acquired 100% of the capital stock of Rentlytics, a provider of business intelligence and data analytics software and services to the multi-family housing industry. The acquisition of Rentlytics expands our business intelligence and performance analytics platform. Aggregate purchase consideration for this acquisition was $55.4 million.
LeaseLabs
In September 2018, we acquired substantially all of the assets of LeaseLabs, a full-stack marketing solutions provider to the multifamily housing industry. LeaseLabs provides online, social media and website marketing services to property management companies. The acquisition of LeaseLabs improves our marketing platform and allows owners and operators to better direct their advertising and marketing spend, thereby increasing the number of qualified leads, accentuating their brand and reducing overall marketing costs. Aggregate purchase consideration for LeaseLabs was $112.9 million.
BluTrend
In July 2018, we acquired substantially all of the assets of BluTrend, a provider of utility management services for the multifamily housing industry. The acquired assets will be integrated with our existing resident utility management platform. We acquired BluTrend for aggregate purchase consideration of $8.5 million.
ClickPay
In April 2018, we acquired substantially all of the outstanding membership units of NovelPay, LLC ("NovelPay"), other than those owned by ClickPay Services, Inc. On the same day, we acquired all of the outstanding stock of ClickPay Services, Inc. (collectively with NovelPay, "ClickPay"). ClickPay provides an electronic payment platform servicing resident units across multiple segments of real estate, which offers integrated payment services to increase operational efficiencies for property owners and managers. The acquisition of ClickPay broadens our presence in the real estate industry, and solidifies the integration of our leasing platform with third-party property management systems. Aggregate purchase consideration for this acquisition was $221.1 million.
Refer to Note 3 of the accompanying Consolidated Financial Statements for further discussion of these acquisitions.
Other Event
During May 2018 and as disclosed in our Form 10-Q for the quarter ended March 31, 2018, we were the subject of a targeted email phishing campaign that led to a business email compromise, pursuant to which an unauthorized party gained access to an external third party system used by a subsidiary that we acquired in 2017. The incident resulted in the diversion of approximately $6.0 million, net of recovered funds, intended for disbursement to three clients. We immediately restored all funds to the client accounts. During the quarter ended June 30, 2018, we remediated the material weakness that gave rise to the incident and implemented additional preventive and detective control procedures.
We maintain insurance coverage to limit our losses related to criminal and network security events. During January 2019, we received approximately $1.0 million from our primary insurance carrier as a partial repayment toward our losses from the business email compromise. We are currently involved in discussions with our insurance carrier regarding coverage of the remaining losses, and intend to vigorously pursue repayment of these losses. Due to the ongoing discussions with our insurance carrier and the uncertainty regarding timing and full collectability of the loss,

we recorded an allowance of $5.0 million for the remaining amount of the loss, which is included in the line “General and administrative” in the accompanying Consolidated Statements of Operations. For the year ended December 31, 2018, total charges from the phishing incident included in our Consolidated Statements of Operations were $5.4 million for losses and related expenses that are not probable of recovery.

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Key Business Metrics

In addition to financial measures, we monitor our operating performance using a number of financially and non-financially derived metrics that are not included in our consolidated financial statements. We monitor the key performance indicators reflected in the following table:

	Year Ended December 31,		
	2018	2017	2016
	(in thousands, except dollar per unit data)		
Revenue:			
Total revenue	$869,480	$670,963	$568,128
On demand revenue	$833,709	$642,622	$542,531
On demand revenue as a percentage of total revenue	95.9 %	95.8 %	95.5 %
Non-GAAP total revenue	$871,370	$674,021	$567,179
Non-GAAP on demand revenue	$835,599	$645,680	$541,582
Adjusted EBITDA	$231,176	$163,445	$127,210
Ending on demand units	16,219	13,003	10,989
Average on demand units	14,847	11,711	11,042
On demand annual client value	$876,637	$751,183	$556,813
On demand revenue per ending on demand unit	$54.05	$57.77	$50.67

On demand revenue: This metric represents the GAAP revenue derived from license and subscription fees relating to our on demand software solutions, typically licensed over one year terms; commission income from sales of renter's insurance policies; and transaction fees for certain of our on demand software solutions. We consider on demand revenue to be a key business metric because we believe the market for our on demand software solutions represents the largest growth opportunity for our business.

On demand revenue as a percentage of total revenue: This metric represents on demand revenue for the period presented divided by total revenue for the same period. We use on demand revenue as a percentage of total revenue to measure our success executing our strategy to increase the penetration of our on demand software solutions and expand our recurring revenue streams attributable to these solutions. We expect our on demand revenue to remain a significant percentage of our total revenue although the actual percentage may vary from period to period due to a number of factors, including the timing of acquisitions; professional and other revenues; and on premise perpetual license sales and maintenance fees.

Non-GAAP total revenue: This metric is calculated by adding acquisition-related and other deferred revenue adjustments to total revenue. We believe it is useful to include deferred revenue written down for GAAP purposes under purchase accounting rules and revenue deferred due to a lack of historical experience determining the settlement of the contractual obligation in order to appropriately measure the underlying performance of our business operations in the period of activity and associated expense. Further, we believe this measure is useful to investors as a way to evaluate our ongoing performance.

The following provides a reconciliation of GAAP to non-GAAP total revenue:

	Year Ended December 31,		
	2018	2017	2016
	(in thousands)		
Total revenue	$869,480	$670,963	$568,128
Acquisition-related and other deferred revenue adjustments	1,890	3,058	(949)
Non-GAAP total revenue	$871,370	$674,021	$567,179

Non-GAAP on demand revenue: This metric reflects total on demand revenue plus acquisition-related and other deferred revenue adjustments, as described above. We believe inclusion of these items provides a useful measure of the underlying performance of our on demand business operations in the period of activity and associated expense. Further, we believe that investors and financial analysts find this measure to be useful in evaluating our ongoing performance because it provides a more accurate depiction of on demand revenue.

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The following provides a reconciliation of GAAP to non-GAAP on demand revenue:

	Year Ended December 31,		
	2018	2017	2016
	(in thousands)		
On demand revenue	$833,709	$642,622	$542,531
Acquisition-related and other deferred revenue adjustments	1,890	3,058	(949)
Non-GAAP on demand revenue	$835,599	$645,680	$541,582

Adjusted EBITDA: We define Adjusted EBITDA as net income, plus (1) acquisition-related and other deferred revenue adjustments, (2) depreciation, asset impairment, and the loss on disposal of assets, (3) amortization of product technologies and intangible assets, (4) loss due to cyber incident, net of recoveries, (5) acquisition-related expense, (6) costs arising from the Hart-Scott-Rodino review process for our acquisitions, (7) interest expense, net, (8) income tax (benefit) expense, (9) headquarters relocation costs, and (10) stock-based expense. We believe that investors and financial analysts find this non-GAAP financial measure to be useful in analyzing our financial and operational performance, comparing this performance to our peers and competitors, and understanding our ability to generate income from ongoing business operations.

The following provides a reconciliation of net income to Adjusted EBITDA:

	Year Ended December 31,		
	2018	2017	2016
	(in thousands)		
Net income	$34,725	$377	$16,650
Acquisition-related and other deferred revenue adjustments	1,890	3,058	(949)
Depreciation, asset impairment, and loss on disposal of assets	35,211	27,752	25,813
Amortization of product technologies and intangible assets	71,708	39,918	30,268
Loss due to cyber incident, net of recoveries	4,952	—	—
Acquisition-related expense	2,437	5,557	363
Costs related to the Hart-Scott-Rodino review process	78	11,012	—
Interest expense, net	29,959	15,072	3,825
Income tax (benefit) expense	(425)	14,864	10,836
Headquarters relocation costs	—	—	3,552
Stock-based expense	50,641	45,835	36,852
Adjusted EBITDA	$231,176	$163,445	$127,210

Ending on demand units: This metric represents the number of rental housing units managed by our clients with one or more of our on demand software solutions at the end of the period. We use ending on demand units to measure the success of our strategy of increasing the number of rental housing units managed with our on demand software solutions. Property unit counts are provided to us by our clients as new sales orders are processed. Property unit counts may be adjusted periodically as information related to our clients' properties is updated or supplemented, which could result in adjustments to the number of units previously reported.

Average on demand units: We calculate average on demand units as the average of the beginning and ending on demand units for each quarter in the period presented. This metric is a measure of our success increasing the number of on demand software solutions utilized by our clients to manage their rental housing units, our overall revenue, and profitability.

On demand annual client value ("ACV"): ACV represents our estimate of the annual value of our on demand revenue contracts at a point in time. We monitor this metric to measure our success in increasing the number of on demand units, and the amount of software solutions utilized by our clients to manage their rental housing units.

On demand revenue per ending on demand unit ("RPU"): We define RPU as ACV divided by ending on demand units. We monitor this metric to measure our success in increasing the penetration of on demand software solutions utilized by our clients to manage their rental housing units.

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Non-GAAP Financial Measures

We report our financial results in accordance with GAAP; however, we believe that, in order to properly understand our short-term and long-term financial, operational, and strategic trends, it may be helpful for investors to exclude certain non-cash or non-recurring items when used as a supplement to financial performance measures in accordance with GAAP. These non-cash or non-recurring items result from facts and circumstances that vary in both frequency and impact on continuing operations. We also use results of operations excluding such items to evaluate our operating performance compared against prior periods, make operating decisions, determine executive compensation, and serve as a basis for long-term strategic planning. These non-GAAP financial measures provide us with additional means to understand and evaluate the operating results and trends in our ongoing business by eliminating certain non-cash expenses and other items that we believe might otherwise make comparisons of our ongoing business with prior periods more difficult, obscure trends in ongoing operations, reduce our ability to make useful forecasts, or obscure the ability to evaluate the effectiveness of certain business strategies and management incentive structures. In addition, we also believe that investors and financial analysts find this information helpful in analyzing our financial and operational performance and comparing this performance to our peers and competitors. These non-GAAP financial measures are used in conjunction with traditional GAAP financial measures as part of our overall assessment of our performance.

We do not place undue reliance on non-GAAP financial measures as measures of operating performance. Non-GAAP financial measures should not be considered substitutes for other measures of financial performance or liquidity reported in accordance with GAAP. There are limitations to using non-GAAP financial measures, including that other companies may calculate these measures differently than we do; that they do not reflect changes in, or cash requirements for, our working capital; and that they do not reflect our capital expenditures or future requirements for capital expenditures. We compensate for the inherent limitations associated with using non-GAAP financial measures through disclosure of these limitations, presentation of our financial statements in accordance with GAAP, and reconciliation of non-GAAP financial measures to the most directly comparable GAAP financial measures.

We exclude or adjust each of the items identified below from the applicable non-GAAP financial measure referenced above for the reasons set forth with respect to each excluded item:

Acquisition-related and other deferred revenue: These items are included to reflect deferred revenue written down for GAAP purposes under purchase accounting rules and revenue deferred due to a lack of historical experience determining the settlement of the contractual obligation in order to appropriately measure the underlying performance of our business operations in the period of activity and associated expense.

Asset impairment and loss on disposal of assets: These items comprise gains and/or losses on the disposal and impairment of long-lived assets, and impairment of indefinite-lived intangible assets, which are not reflective of our ongoing operations. We believe exclusion of these items facilitates a more accurate comparison of our results of operations between periods.

Depreciation of long-lived assets: Long-lived assets are depreciated over their estimated useful lives in a manner reflecting the pattern in which the economic benefit is consumed. Management is limited in its ability to change or influence these charges after the asset has been acquired and placed in service. We do not believe that depreciation expense accurately reflects the performance of our ongoing operations for the period in which the charges are incurred, and are therefore not considered by management in making operating decisions.

Amortization of product technologies and intangible assets: These items are amortized over their estimated useful lives and generally cannot be changed or influenced by management after acquisition. Accordingly, these items are not considered by us in making operating decisions. We do not believe such charges accurately reflect the performance of our ongoing operations for the period in which such charges are incurred.

Loss due to cyber incident, net of recoveries - This item relates to losses, net of recoveries, arising from the May 2018 incident in which we were the subject of a targeted email phishing campaign. We believe this loss is not reflective of our ongoing operations and that exclusion of this item facilitates a more accurate comparison of our results of operations between periods.

Acquisition-related expense: These items consist of direct costs incurred in our business acquisition transactions and the impact of changes in the fair value of acquisition-related contingent consideration obligations. We believe exclusion of these items facilitates a more accurate comparison of the results of our ongoing operations across periods and eliminates volatility related to changes in the fair value of acquisition-related contingent consideration obligations.

Costs arising from Hart-Scott-Rodino review process: This item consists of direct costs incurred related to reviews by the United States Federal Trade Commission and Department of Justice of our 2017 acquisitions of LRO and On-Site, and our 2018 acquisition of LeaseLabs under the Hart-Scott-Rodino Antitrust Improvements Act. We believe that these costs are not reflective of our ongoing operations or our normal acquisition activity. Exclusion of these costs facilitates a more accurate comparison of our results across periods.

Headquarters relocation costs: These items consist of duplicative rent and other expenses related to the relocation of our corporate headquarters and data center, which was substantially completed in the third quarter of 2016. These costs are not reflective of our ongoing operations due to their non-recurring nature.

Stock-based expense: This item is excluded because these are non-cash expenditures that we do not consider part of ongoing operating results when assessing the performance of our business, and also because the total amount of the expenditure is partially outside of management's control because it is based on factors such as stock price, volatility, and interest rates, which may be unrelated to our performance during the period in which the expenses are incurred.

Key Components of Our Results of Operations

As described in Note 2 of the accompanying Consolidated Financial Statements for the year ended December 31, 2018, we have changed the presentation of our Consolidated Statements of Operations to add "Amortization of product technologies" and "Amortization of intangible assets" as separate line items within such statements. Amounts shown as amortization of product technologies were previously included within "Cost of revenue", and amounts shown as amortization of intangible assets were previously included within the "Sales and marketing" operating expense category. Amounts for prior periods have been reclassified in order to conform to the current period presentation.

Revenue

We derive our revenue from two primary sources: our on demand software solutions and our professional and other services.

On demand revenue: Revenue from our on demand software solutions is comprised of license and subscription fees relating to our on demand software solutions, typically licensed for one year terms; commission income from sales of renter's insurance policies; and transaction fees for certain on demand software solutions, such as payment processing, spend management, and billing services. For our insurance based solutions, our agreement provides for a fixed commission on earned premiums related to the policies sold by us. The agreement also provides for a contingent commission to be paid to us in accordance with the agreement. Our transaction-based solutions are priced based on a fixed rate per transaction.

Professional and other revenue: Revenue from professional and other services consists of consulting and implementation services; training; and other ancillary services. We complement our solutions with professional and other services for our clients willing to invest in enhancing the value or decreasing the implementation time of our solutions. Our professional and other services are typically priced as time and materials engagements. Professional and other revenue also includes revenues generated from sub-meter installation services under our resident utility management solutions, and our on premise solutions.

Cost of Revenue

Cost of revenue consists primarily of personnel costs related to our operations; support services; training and implementation services; expenses related to the operation of our data centers; and fees paid to third-party service providers. Personnel costs include salaries, bonuses, stock-based expense, and employee benefits. Cost of revenue also includes an allocation of facilities costs, overhead costs, and depreciation, which are allocated based on headcount.

Amortization of Product Technologies

Amortization of product technologies includes amortization of developed product technologies related to strategic acquisitions and amortization of capitalized development costs.

Operating Expenses

We classify our operating expenses into three primary categories: product development, sales and marketing, and general and administrative. Our operating expenses primarily consist of personnel costs; costs for third-party contracted development; marketing; legal; accounting and consulting services; and other professional service fees. Personnel costs for each category of operating expenses include salaries, bonuses, stock-based expense, and employee benefits for employees in that category. Our operating expenses also include an allocation of our facilities costs; overhead costs and depreciation based on headcount for that category.

Product development: Product development expense consists primarily of personnel costs for our product development employees and executives, information technology and facilities, and fees to contract development vendors. Our product development efforts are focused primarily on increasing the functionality and enhancing the ease of use of our platform of solutions and expanding our suite of data analytics and on demand software solutions. In addition to our locations in the United States, we maintain product development and service centers in Hyderabad, India; Manila, Philippines; and Cebu City, Philippines.

Sales and marketing: Sales and marketing expense consists primarily of personnel costs for our sales, marketing, and business development employees and executives; information technology; travel and entertainment; and marketing programs. Marketing programs consist of amounts paid for product marketing, renter's insurance; other advertising; trade shows; user conferences; public relations; and industry sponsorships and affiliations.

General and administrative: General and administrative expense consists of personnel costs for our executives, finance and accounting, human resources, management information systems, and legal personnel. In addition, general and administrative expense includes fees for professional services, including legal, accounting, and other consulting services; information technology and facilities costs; and acquisition-related costs, including direct costs incurred to complete our acquisitions and changes in the fair value of our acquisition-related contingent consideration obligations.

Amortization of intangible assets: Amortization of intangible assets consist of amortization of purchased intangible assets, including client relationships; key vendor and supplier relationships; finite-lived trade names; and non-compete agreements, obtained in connection with our acquisitions.

Interest Expense and Other, Net

Interest expense, net, consists primarily of interest income, interest expense, and impairments on investments. Interest income represents earnings from our cash and cash equivalents. Interest expense is associated with amounts borrowed under the Credit Facility, Convertible Notes, capital lease obligations, and certain acquisition-related liabilities, and includes expense from the amortization of related discounts and debt issuance costs. We participate in interest rate swap agreements, the purpose of which is to eliminate variability in interest rate payments on a portion of the Term Loans. For that portion, the swap agreements replace the Term Loan's variable rate with a fixed rate.

Critical Accounting Policies and Estimates

Our Consolidated Financial Statements are prepared in accordance with GAAP. In many cases, the accounting treatment of a particular transaction is specifically dictated by GAAP and does not require management's judgment in its application, while in other cases, management's significant judgment is required to make estimates, assumptions, and judgments that affect the reported amount of assets, liabilities, revenue, expenses, and related disclosures. We base our estimates and assumptions on historical experience and other factors that we believe to be reasonable under the circumstances. In some instances, we could reasonably use different accounting estimates, and in other instances, results could differ significantly from our estimates. We evaluate our estimates and assumptions on an ongoing basis. To the extent that there are differences between our estimates and actual results, our future financial statement presentation, financial condition, results of operations, and cash flows will be affected.

While our significant accounting policies are more fully described in Note 2 “Summary of Significant Accounting Policies” to our Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K, we believe that the following accounting policies are critical to understanding our historical and future performance, as these policies relate to the more significant areas involving our management's judgments, assumptions and estimates.

Revenue Recognition

Revenues are derived from: on demand software solutions, and professional services and other goods and services. We recognize revenue as we satisfy one or more service obligations under the terms of a contract, generally as control of goods and services are transferred to our clients. Revenue is measured as the amount of consideration we expect to receive in exchange for transferring goods or providing services. We include estimates of variable consideration in revenue to the extent that it is probable that a significant reversal of cumulative revenue will not occur.

On Demand Revenue

Our on demand revenue consists of license and subscription fees, transaction fees related to certain of our software-enabled value-added services, and commissions derived from our selling certain risk mitigation services.

We generally recognize revenue from subscription fees on a straight-line basis over the access period beginning on the date that we make our service available to the client. Our subscription agreements generally are non-cancellable, have an initial term of one year or longer and are billed either monthly, quarterly or annually in advance. Non-refundable upfront fees billed at the initial order date that are not associated with an upfront service obligation are recognized as revenue on a straight-line basis over the period in which the client is expected to benefit, which we consider to be three years.

We recognize revenue from transaction fees in the month the related services are performed based on the amount we have the right to invoice.

We offer risk mitigation services to our clients by acting as an insurance agent and derive commission revenue from the sale of insurance products to our clients' residents. The commissions are based upon a percentage of the premium that the

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insurance company charges to the policyholder and are subject to forfeiture in instances where a policyholder cancels prior to the end of the policy. Our contract with our underwriting partner provides for contingent commissions to be paid to us in accordance with the agreement. Our estimate of contingent commission revenue considers the variable factors identified in the terms of the applicable agreement. We recognize commissions related to these services as earned ratably over the policy term and insurance commission receivable in “Accounts receivable, less allowances.”

Professional and Other Revenue

Professional services and other revenues generally consist of the fees we receive for providing implementation and consulting services, submeter equipment and ongoing maintenance of our existing on premise licenses.

Professional services are billed either on a time and materials basis or on a fixed price basis, and revenue is recognized over time as we perform the obligation. Professional services are typically sold bundled in a contract with other on demand solutions but may be sold separately. Professional service contracts sold separately generally have terms of one year or less. For bundled arrangements, where we account for individual services as a separate performance obligation, the transaction price is allocated between separate services in the bundle based on their relative standalone selling prices.

Other revenues consist primarily of submeter equipment sales that include related installation services. Such sales are considered bundled, and revenue from these bundled sales is recognized in proportion to the number of installed units completed to date as compared to the total contracted number of units to be provided and installed. For all other equipment sales, we generally recognize revenue when control of the hardware has transferred to our client.

Revenue recognized for on premise software sales generally consists of annual maintenance renewals on existing term or perpetual license, which is recognized ratably over the service period.

Contract with Multiple Performance Obligations

The majority of the contracts we enter into with clients, including multiple contracts entered into at or near the same time with the same client, require us to provide one or more on demand software solutions, professional services and may include equipment. For these contracts, we account for individual performance obligations separately: i) if they are distinct or ii) if the promised obligation represents a series of distinct services that are substantially the same and have the same pattern of transfer to the client. Once we determine the performance obligations, we determine the transaction price, which includes estimating the amount of variable consideration, if any, to be included in the transaction price. For contracts with multiple performance obligations, we allocate the transaction price to the separate performance obligations on a relative standalone selling price basis. The standalone selling prices of our service are estimated using a market assessment approach based on our overall pricing objectives taking into consideration market conditions and other factors including the number off solutions sold, client demographics and the number and types of users with our contracts.

Sales, value add, and other taxes we collect from clients and remit to governmental authorities are excluded from revenues.

Deferred Commissions

We capitalize certain commissions as incremental costs of obtaining a contract with a client if we expect to recover those costs. The commissions are capitalized and amortized over a period of benefit determined to be three years. Deferred commissions were capitalized for open contracts at the adoption date of the new revenue standard and were capitalized for new contracts in 2018. As a result, there will be a net benefit to “Operating income” in our Consolidated Statements of Operations during 2018 as capitalization of costs exceed amortization. As capitalized costs amortize into expense over time, the accretive benefit in 2018 is expected to moderate in 2019 and normalize in 2020.

As of December 31, 2018, the current and noncurrent balance of capitalized commissions costs recorded in the lines “Other current assets” and “Other assets” in the accompanying Consolidated Balance Sheets was $6.7 million and $7.8 million, respectively. During the year ended December 31, 2018, we amortized commission costs totaling $5.4 million which are included in “Sales and marketing” expense in the accompanying Consolidated Statements of Operations. No impairment loss was recognized in relation to these capitalized costs.

Stock-Based Expense

We recognize compensation expense related to awards of stock options and restricted stock granted to employees, non-employee directors, and other service providers based on the estimated fair value of the awards on the date of grant. We recognize expense for stock options and restricted stock awards on a straight-line basis over the requisite service period of the awards. For market-based awards, expense is recognized over the requisite service period using the graded-vesting attribution method. Compensation expense is reduced for forfeitures once they occur.

The fair value of our time-based restricted stock awards is based on the closing price of our common stock on the date of grant. The fair value of our market-based restricted stock awards is estimated using a discrete model based on multiple stock price-paths developed through the use of Monte Carlo simulation. Changes to the assumptions underlying our valuation model may have a significant impact on the underlying value of the market-based restricted stock awards, which could have a material impact on our Consolidated Financial Statements.

Income Taxes

Income taxes are recorded based on the liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been recognized in our consolidated financial statements or tax returns. Deferred tax assets and liabilities are measured using the tax rates that are expected to apply to taxable income for the years in which those tax assets and liabilities are expected to be realized or settled. We recognize the effect of tax rate changes on current and accumulated deferred income taxes in the period in which the rate change was enacted.

Valuation allowances are provided when it is more likely than not that all or a portion of the deferred tax asset will not be realized. The factors used to assess the need for a valuation allowance include historical earnings, our latest forecast of taxable income, and available tax planning strategies that could be implemented to realize the net deferred tax assets. In projecting future taxable income, we begin with historical results and incorporate assumptions including the amount of future state, federal and foreign pretax operating income, the reversal of temporary differences, and the implementation of feasible and prudent tax planning strategies, if any. These assumptions require significant judgment about the forecasts of future taxable income and are consistent with the plans and estimates we are using to manage the underlying businesses.

We may recognize a tax benefit from uncertain tax positions only if it is at least more likely than not that the tax position will be sustained upon examination by the taxing authorities, based on the technical merits of the position. The tax benefits recognized in the financial statements from such a position are measured based on the largest benefit that has a greater than fifty percent likelihood of being realized upon settlement with the taxing authorities.

Business Combinations

We allocate the fair value of the purchase consideration of our acquisitions to the tangible assets acquired, liabilities assumed, and intangible assets acquired based on their estimated fair values. The excess of the fair value of purchase consideration over the fair values of these identifiable assets and liabilities is recorded as goodwill. The allocation of the purchase price requires management to make significant estimates in determining the fair values of assets acquired and liabilities assumed, especially with respect to intangible assets. These estimates can include, but are not limited to, the cash flows that an asset is expected to generate in the future, the appropriate weighted average cost of capital, and the estimated useful lives. These estimates are inherently uncertain and unpredictable. In addition, unanticipated events and circumstances may occur in future periods which may affect the realizability of these estimated asset values.

Additionally, at times we provide for the payment of additional purchase consideration to the extent certain targets are achieved in the future. The fair value of this contingent consideration is based on significant estimates and is initially recorded as part of the fair value of the purchase consideration. Changes to the fair value are reflected in the Consolidated Statements of Operations.

Goodwill and Indefinite-Lived Intangible Assets

We have recorded goodwill and indefinite-lived intangible assets in conjunction with our business acquisitions. We test goodwill and indefinite-lived intangible assets for impairment separately on an annual basis in the fourth quarter of each year, or more frequently if circumstances indicate that the assets may not be recoverable.

We evaluate impairment of goodwill either by assessing qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount, or by performing a quantitative assessment. If we choose to perform a qualitative assessment and after considering the totality of events or circumstances, we determine it is more likely than not that the fair value of a reporting unit is less than its carrying amount, we would perform a quantitative fair value test. To calculate any potential impairment, we compare the fair value of a reporting unit with its carrying amount, including goodwill. Any excess of the carrying amount of the reporting unit's goodwill over its fair value is recognized as an impairment loss, and the carrying value of goodwill is written down. For purposes of goodwill impairment testing, we have one reporting unit.

We quantitatively evaluate indefinite-lived intangible assets by estimating the fair value of those assets based on estimated future earnings derived from the assets using the income approach. Assets with indefinite lives that have been determined to be inseparable due to their interchangeable use are grouped into single units of accounting for purposes of testing for impairment. If the carrying amount of an identified intangible asset with an indefinite life exceeds its fair value, we recognize an impairment loss equal to the excess of carrying value over fair value.

Internally Developed Software

We capitalize certain development costs incurred in connection with software development for our solutions to be marketed to external users. Costs incurred in the preliminary stages of development are expensed as incurred. Once an application has reached the technological feasibility stage, internal and external costs including costs of materials, services, and

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payroll and payroll-related costs for employees, are capitalized, if direct and incremental, until the software is available for general release to customers. Minor upgrades and enhancements are also expensed as incurred. Costs related to specific upgrades and enhancements when it is probable the expenditures will result in additional functionality are capitalized.

Costs incurred to develop software intended solely for our internal use, such as internal administration and finance and accounting systems, are capitalized during the application development stage.

Capitalized costs are recorded as part of property, equipment, and software. Internally developed software is amortized on a straight-line basis over its estimated useful life, generally five years. Management evaluates the useful lives of these assets on an annual basis and tests for impairment whenever events or changes in circumstances occur that could impact the recoverability of these assets.

Recent Accounting Pronouncements

See Note 2 “Summary of Significant Accounting Policies” to our Consolidated Financial Statements for discussion about new accounting pronouncements adopted and those pending.

Results of Operations

The following tables set forth our results of operations for the specified periods. The period-to-period comparison of financial results is not necessarily indicative of future results.

Amounts presented below reflect the correction of an immaterial error related to the misclassification of amortization expense on certain acquired intangible assets. Additionally, the amounts below reflect a change in presentation of our Consolidated Statements of Operations to add “Amortization of product technologies” and “Amortization of intangible assets” as separate line items within such statements. Refer to Note 2 of the accompanying Consolidated Financial Statements for further discussion of these items.

Consolidated Statements of Operations Data

	Year Ended December 31,		
	2018	2017	2016
	(in thousands)		
Revenue:			
On demand	$833,709	$642,622	$542,531
Professional and other	35,771	28,341	25,597
Total revenue	869,480	670,963	568,128
Cost of revenue (1)	328,382	258,135	225,539
Amortization of product technologies	35,797	22,163	17,669
Gross profit	505,301	390,665	324,920
Operating expenses:			
Product development (1)	118,525	89,452	73,607
Sales and marketing (1)	166,607	140,473	122,457
General and administrative (1)	118,208	112,975	85,013
Amortization of intangible assets	35,911	17,755	12,599
Total operating expenses	439,251	360,655	293,676
Operating income	66,050	30,010	31,244
Interest expense and other, net	(31,750)	(14,769)	(3,758)
Income before income taxes	34,300	15,241	27,486
Income tax (benefit) expense	(425)	14,864	10,836
Net income	$34,725	$377	$16,650

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(1) Includes stock-based expense as follows:

	Year Ended December 31,		
	2018	2017	2016
	(in thousands)		
Cost of revenue	$4,403	$3,842	$3,310
Product development	9,923	8,423	7,071
Sales and marketing	16,573	14,592	11,364
General and administrative	19,742	18,978	15,107

The following table sets forth our results of operations for the specified periods as a percentage of our revenue for those periods. The period-to-period comparison of financial results is not necessarily indicative of future results.

	Year Ended December 31,		
	2018	2017	2016
	(as a percentage of total revenue)		
Revenue:			
On demand	95.9 %	95.8 %	95.5 %
Professional and other	4.1	4.2	4.5
Total revenue	100.0	100.0	100.0
Cost of revenue	37.8	38.5	39.7
Amortization of product technologies	4.1	3.3	3.1
Gross profit	58.1	58.2	57.2
Operating expenses:			
Product development	13.6	13.3	13.0
Sales and marketing	19.2	20.9	21.4
General and administrative	13.6	16.8	15.1
Amortization of intangible assets	4.1	2.7	2.2
Total operating expenses	50.5	53.7	51.7
Operating income	7.6	4.5	5.5
Interest expense and other, net	(3.6)	(2.2)	(0.7)
Income before income taxes	4.0	2.3	4.8
Income tax (benefit) expense	—	2.2	1.9
Net income	4.0 %	0.1 %	2.9 %

Comparison of the years ended December 31, 2018 and 2017

Revenue

	Year Ended December 31,			
	2018	2017	Change	% Change
	(in thousands, except dollar per average on demand unit data)			
Revenue:				
On demand	$833,709	$642,622	$191,087	29.7 %
Professional and other	35,771	28,341	7,430	26.2
Total revenue	$869,480	$670,963	$198,517	29.6
Non-GAAP on demand revenue	$835,599	$645,680	$189,919	29.4
Ending on demand units	16,219	13,003	3,216	24.7

Average on demand units	14,847	11,711	3,136	26.8
On demand annual client value	$876,637	$751,183	$125,454	16.7
On demand revenue per ending on demand unit	$54.05	$57.77	$(3.72)	(6.4)%

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On demand revenue: During the year ended December 31, 2018, on demand revenue increased $191.1 million, or 29.7%, as compared to the same period in 2017. This increase was driven by incremental revenue from our recent acquisitions and growth across our platform of solutions, most significantly in resident services. On demand revenue per ending on demand unit decreased from $57.77 to $54.05 during the year ended December 31, 2018, driven by our acquisition of ClickPay which has a lower revenue per unit than the rest of our on demand units. Excluding the impact of the ClickPay acquisition, on demand revenue per ending on demand unit increased 5.5% year-over-year as a result of our 2017 acquisitions and the consistent organic growth of our resident services, property management, and asset optimization solutions.

On demand revenue associated with our property management solutions grew $20.0 million, or 12.0%, during the twelve months ended December 31, 2018, as compared to the same period in 2017. This increase was primarily driven by the growth of our spend management solutions and adoption of our OneSite property management solutions.

On demand revenue from our resident services solutions continued to experience significant growth, increasing by $78.3 million, or 28.8%, year-over-year. This growth was principally driven by our payments solutions and incremental revenue from our recent acquisitions.

On demand revenue from our leasing and marketing solutions increased $42.5 million, or 34.4%, during the year ended December 31, 2018, as compared to the same period in 2017. This increase was largely attributable to incremental revenue from our acquisition of On-Site in the third quarter of 2017 and, to a lesser extent, our 2018 acquisition of LeaseLabs and our 2017 acquisition of LRO.

On demand revenue from our asset optimization solutions increased year-over-year by $50.3 million, or 63.1%, primarily driven by incremental revenue from our acquisition of LRO in the fourth quarter of 2017, as well as organic growth across our asset optimization platform, evidencing market acceptance of data-driven solutions.

Professional and other revenue: Professional and other revenue increased by $7.4 million during the year ended December 31, 2018, due to the growth in our professional services within our asset optimization and property management solutions, an increase in sub-meter installation services, and the impact of our adoption of ASC 606.

On demand unit metrics: As of December 31, 2018, one or more of our on demand solutions was utilized in the management of approximately 16.2 million rental property units. On demand units increased year-over-year by 3.2 million units, or 24.7%. This growth is attributable to our 2018 acquisitions, which accounted for approximately 15.6% of total ending on demand units, new client sales, and marketing efforts to existing clients.

Cost of Revenue

	Year Ended December 31,			
	2018	2017	Change	% Change
	(in thousands)			
Cost of revenue	$311,907	$242,503	$69,404	28.6 %
Stock-based expense	4,403	3,842	561	14.6
Depreciation expense	12,072	11,790	282	2.4
Total cost of revenue	$328,382	$258,135	$70,247	27.2 %

During the year ended December 31, 2018, cost of revenue, excluding stock-based expense and depreciation expense, increased $69.4 million, as compared to the same period in 2017. Direct costs increased $29.2 million, primarily driven by incremental costs from our recent acquisitions and higher transaction volume from our payment processing solutions. Personnel expense increased year-over-year by $27.3 million, primarily attributable to new employees from our recent acquisitions and investments to support our ongoing organic growth. Information technology and facilities cost also increased $10.9 million during the year ended December 31, 2018 compared to the prior year, primarily due to incremental costs from our recent acquisitions and investments to support our continued growth.

Amortization of Product Technologies

	Year Ended December 31,			
	2018	2017	Change	% Change

	(in thousands)			
Amortization of product technologies	$35,797	$22,163	$13,634	61.5 %

During the year ended December 31, 2018, amortization of product technologies increased $13.6 million compared to the prior year. Higher amortization expense was driven by the addition of developed product technologies in connection with our recent acquisitions and an increase in amortization of developed software related to investment in innovation and product solutions.

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Our gross margin remained essentially flat at 58.1% for the year ended December 31, 2018.

Operating Expenses

Product development

	Year Ended December 31,			
	2018	2017	Change	% Change
	(in thousands)			
Product development expense	$102,935	$74,421	$28,514	38.3 %
Stock-based expense	9,923	8,423	1,500	17.8
Depreciation expense	5,667	6,608	(941)	(14.2)
Total product development expense	$118,525	$89,452	$29,073	32.5 %

Product development expense, excluding stock-based expense and depreciation expense, increased year-over-year by $28.5 million. Incremental headcount from our recent acquisitions and investments to support our product and innovation initiatives contributed to a year-over-year increase in personnel expense of $18.3 million compared to prior year. Facilities, platform and technology infrastructure investments, as well as incremental costs from recent acquisitions, resulted in an increase of $8.1 million. Consulting and professional fees increased $2.0 million compared to prior year, primarily driven by our recent acquisitions.

Product development expense as a percentage of total revenue was 13.6% in 2018, up slightly from 13.3% in 2017, primarily driven by our platform, infrastructure and innovation investments.

Sales and marketing

	Year Ended December 31,			
	2018	2017	Change	% Change
	(in thousands)			
Sales and marketing expense	$145,081	$123,394	$21,687	17.6 %
Stock-based expense	16,573	14,592	1,981	13.6
Depreciation expense	4,953	2,487	2,466	99.2
Total sales and marketing expense	$166,607	$140,473	$26,134	18.6 %

Sales and marketing expense for the year ended December 31, 2018, excluding stock-based expense and depreciation expense, increased $21.7 million, as compared to the same period in 2017. Personnel expense increased $10.8 million year-over-year, driven by investments in our sales force and product marketing team and incremental headcount from our recent acquisitions. These investments were net of a $3.4 million reduction in commission expense from 2017 to 2018 resulting from our adoption of ASC 606 under which we capitalize a significant portion of commissions earned by our sales force and amortize such commissions to expense over a three year customer benefit period. This net benefit is expected to moderate in 2019 and normalize in 2020. Marketing program costs increased year-over-year by $4.1 million, reflecting investments to accelerate client demand across our portfolio of solutions. In addition, in the fourth quarter of 2018, we recorded an impairment charge of $2.7 million related to the indefinite-lived trade name of our 2010 acquisition of Level One, due to a change in our long-term marketing strategy for this product offering, which included a shift away from the use of a separate Level One branding and towards a RealPage Contact Center branding.

Sales and marketing expense as a percentage of total revenue decreased from 20.9% for the year ended December 31, 2017, to 19.2% for the year ended December 31, 2018. This decrease is primarily due to scale built in our sales and marketing engine and lower sales commission expense from the adoption of ASC 606 as discussed above.

General and administrative

	Year Ended December 31,			
	2018	2017	Change	% Change
	(in thousands)			
General and administrative expense	$92,680	$87,654	$5,026	5.7 %

Stock-based expense	19,742	18,978	764	4.0
Depreciation expense	5,786	6,343	(557)	(8.8)
Total general and administrative expense	$118,208	$112,975	$5,233	4.6 %

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General and administrative expense, excluding stock-based expense and depreciation expense, increased year-over-year by $5.0 million. Personnel expense increased $14.1 million, reflecting investments to support our continued growth and incremental headcount from our recent acquisitions. For the year ended December 31, 2018, we recognized a loss of $5.4 million in connection with a targeted email phishing campaign. Loss on disposal of assets increased $1.5 million primarily due to early retirement of assets from 2018 upgrades in our data center infrastructure. Legal and professional fees decreased $9.4 million compared to prior year, principally related to 2017 costs associated with the Hart-Scott-Rodino review process for the LRO and On-Site acquisitions. These costs were partially offset by our settlement with the FTC. Information technology and facilities expense also decreased $5.3 million due to refinements in our allocation methodology following recent acquisitions.
General and administrative expense as a percentage of total revenue decreased from 16.8% to 13.6% during the year ended December 31, 2018, as compared to the same period in 2017, primarily due to the 2017 costs associated with the Hart-Scott-Rodino review process. Excluding the impact of these costs, general and administrative expense as a percentage of total revenue decreased year-over-year from 15.2% to 13.6%, primarily due to scale across our administrative functions.
Amortization of intangible assets

	Year Ended December 31,			
	2018	2017	Change	% Change
	(in thousands)			
Amortization of intangible assets	$35,911	$17,755	$18,156	102.3 %

During the year ended December 31, 2018, amortization expense of intangible assets increased $18.2 million compared to the prior year, primarily driven by the addition of finite-lived client relationship and trade name assets in connection with our recent acquisitions.
Interest Expense and Other, Net

	Year Ended December 31,			
	2018	2017	Change	% Change
	(in thousands)			
Interest expense	$(32,402)	$(16,012)	$(16,390)	102.4 %
Interest income	2,443	940	1,503	159.9
Impairment loss on investment	(2,000)	—	(2,000)	100.0
Other income	209	303	(94)	(31.0)
Total interest expense and other, net	$(31,750)	$(14,769)	$(16,981)	115.0 %

Interest expense and other for the year ended December 31, 2018, increased $17.0 million as compared to the same period in 2017. These increases were primarily due to interest and amortization expense related to our Convertible Notes issued in May 2017, and higher interest expense under our Credit Facility, as a result of additional borrowings in support of our 2017 and 2018 acquisitions. The increase was also attributable to the $2.0 million impairment loss relating to our investment in WayBlazer based on WayBlazer's voluntary bankruptcy filing in the third quarter of 2018.
Provision for Income Taxes
Our effective tax rate was (1.2)% and 97.5% for the years ended December 31, 2018 and 2017, respectively. For the year ended December 31, 2018, we recognized a consolidated tax benefit of $0.4 million on income before income taxes of $34.3 million. We recognized a domestic income tax benefit of $0.8 million, with an effective tax rate of (2.6)%. This rate resulted primarily from a decrease in tax expense of approximately $11.8 million attributable to excess stock compensation deductions recognized in connection with the vesting of certain restricted stock grants and the exercise of certain stock options in 2018. Prior to our adoption of ASC 2016-09 effective January 1, 2017, the benefit of such stock compensation deductions when realized was recognized in additional paid in capital rather than as a benefit or charge to the tax provision. We incurred foreign income tax expense of $0.4 million with an effective

rate of 19.5%. Our foreign effective tax rate is lower than foreign statutory rates primarily because a portion of our foreign operations in India and the Philippines occur in tax advantaged economic zones or are subject to statutory tax holidays.

Our high consolidated tax rate in 2017 resulted primarily from the enactment of the Tax Reform Act which resulted in a one-time net tax charge of $27.3 million associated with the remeasurement of net U.S. deferred tax assets at a reduced 21% corporate income tax rate and the imposition of a one-time transition tax on the mandatory deemed repatriation of foreign earnings. These charges were partially offset by excess stock compensation deductions of $19.1 million for 2017.

For further discussion, including a reconciliation of our effective tax rate from the statutory federal rate, see Note 12 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K.

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Comparison of the years ended December 31, 2017 and 2016

Revenue

	Year Ended December 31,			
	2017	2016	Change	% Change
	(in thousands, except dollar per average on demand unit data)			
Revenue:				
On demand	$642,622	$542,531	$100,091	18.4 %
Professional and other	28,341	25,597	2,744	10.7
Total revenue	$670,963	$568,128	$102,835	18.1
Non-GAAP on demand revenue	$645,680	$541,582	$104,098	19.2
Ending on demand units	13,003	10,989	2,014	18.3
Average on demand units	11,711	11,042	669	6.1
On demand annual client value	$751,183	$556,813	$194,370	34.9
On demand revenue per ending on demand unit	$57.77	$50.67	$7.10	14.0 %

On demand revenue: During the year ended December 31, 2017, on demand revenue increased $100.1 million, or 18.4%, as compared to the same period in 2016. This increase was driven by incremental revenue from our 2017 acquisitions and growth across our platform of solutions, most significantly in resident services. Revenue per ending on demand unit increased from $50.67 to $57.77 during the year ended December 31, 2017, despite the dilutive effect of our year-over-year growth in on demand units.

On demand revenue associated with our property management solutions grew $14.1 million, or 9.2%, during the twelve months ended December 31, 2017, as compared to the same period in 2016. This increase was primarily driven by strong performance in our spend management solutions, as well as adoption of our OneSite property management and accounting solutions.

On demand revenue from our resident services solutions continued to experience significant growth, increasing by $54.1 million, or 24.8%, year-over-year. This growth was principally driven by our payments solutions and our resident utility management solutions, which benefited from incremental revenue from our acquisition of AUM. The performance of our renter's insurance products also contributed to this growth, despite the adverse impact of Hurricanes Harvey and Irma during the third quarter of 2017.

On demand revenue from our leasing and marketing solutions increased $7.3 million, or 6.3%, during the year ended December 31, 2017, as compared to the same period in 2016. This increase was largely attributable to incremental revenue from our acquisition of On-Site in the third quarter of 2017. The increase was partially offset by lower revenues as a result of the sale of our senior living referral services in the fourth quarter of 2016 and from our contact center, which was adversely effected by unfavorable macro-economic conditions and increased competition.

On demand revenue from our asset optimization solutions increased year-over-year by $24.6 million, or 44.7%, primarily driven by incremental revenue from our 2017 acquisition of Axiometrics and, to a lesser extent, our acquisition of LRO. On demand revenue also benefited from year-over-year growth across our asset optimization platform, evidencing market acceptance of data-driven solutions.

Professional and other revenue: Professional and other revenue increased by $2.7 million during the year ended December 31, 2017, primarily driven by our acquisition of AUM in the second quarter of 2017 as well as growth from our asset optimization solutions, including our portfolio asset management solution. This growth was partially offset by lower implementation and consulting revenue during the year ended December 31, 2017, as compared to the same period in 2016.

On demand unit metrics: As of December 31, 2017, one or more of our on demand solutions was utilized in the management of approximately 13.0 million rental property units. On demand units increased year-over-year by 2.0 million units, or 18.3%. This growth is attributable to our 2017 acquisitions, new client sales, and marketing efforts to existing clients.

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Cost of Revenue

	Year Ended December 31,			
	2017	2016	Change	% Change
	(in thousands)			
Cost of revenue	$242,503	$210,825	$31,678	15.0 %
Stock-based expense	3,842	3,310	532	16.1
Depreciation expense	11,790	11,404	386	3.4
Total cost of revenue	$258,135	$225,539	$32,596	14.5 %

During the year ended December 31, 2017, cost of revenue, excluding stock-based expense and depreciation expense, increased $31.7 million, as compared to the same period in 2016. Personnel expense was the primary driver of this increase, growing year-over-year by $17.6 million. This growth was largely attributable to employees from our 2017 acquisitions and investments to support our growth. Higher transaction volume from our payments solutions and incremental costs from our recent acquisitions drove an increase in direct costs of $13.1 million during the year ended December 31, 2017.

Amortization of Product Technologies

	Year Ended December 31,			
	2017	2016	Change	% Change
	(in thousands)			
Amortization of product technologies	$22,163	$17,669	$4,494	25.4 %

During the year ended December 31, 2017, amortization of product technologies increased $4.5 million, as compared to the same period in 2016. This increase was attributable to additions of developed product technologies in connection with our 2017 acquisitions.

Our gross margin increased during the year ended December 31, 2017, as compared to the prior year, moving from 57.2% to 58.2%. This increase was driven by greater scale across our multifamily business and improving efficiencies in certain lower margin products. In addition, our recent acquisitions in the asset optimization product category have contributed to margin expansion due to margin profiles that are more heavily weighted to pure software rather than software-enabled services.

Operating Expenses

Product development

	Year Ended December 31,			
	2017	2016	Change	% Change
	(in thousands)			
Product development expense	$74,421	$60,800	$13,621	22.4 %
Stock-based expense	8,423	7,071	1,352	19.1
Depreciation expense	6,608	5,736	872	15.2
Total product development expense	$89,452	$73,607	$15,845	21.5 %

Product development expense, excluding stock-based expense and depreciation expense, increased year-over-year by $13.6 million. Incremental costs from our recent acquisitions resulted in a year-over-year increase of $6.9 million in product development expense. Additionally, our innovation investments drove a combined increase of $5.5 million in personnel expense and professional fees in 2017.

Product development expense as a percentage of total revenue in 2017 was relatively consistent with 2016, at 13.3% and 13.0%, respectively.

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Sales and marketing

	Year Ended December 31,			
	2017	2016	Change	% Change
	(in thousands)			
Sales and marketing expense	$123,394	$108,693	$14,701	13.5 %
Stock-based expense	14,592	11,364	3,228	28.4
Depreciation expense	2,487	2,400	87	3.6
Total sales and marketing expense	$140,473	$122,457	$18,016	14.7 %

Sales and marketing expense for the year ended December 31, 2017, excluding stock-based expense and depreciation expense, increased $14.7 million, as compared to the same period in 2016. Personnel expense increased $11.1 million year-over-year, reflecting incremental headcount from our 2017 acquisitions and investment in our sales force to drive future growth. Investments to accelerate demand across our portfolio of solutions drove a year-over-year increase in marketing program costs of $2.9 million. These combined investments resulted in improved sales force productivity and strong new sales bookings.

Sales and marketing expense as a percentage of total revenue decreased from 21.4% for the year ended December 31, 2016, to 20.9% for the year ended December 31, 2017. This decrease reflects increased efficiency and productivity in our sales operations.

General and administrative

	Year Ended December 31,			
	2017	2016	Change	% Change
	(in thousands)			
General and administrative expense	$87,654	$64,881	$22,773	35.1 %
Stock-based expense	18,978	15,107	3,871	25.6
Depreciation expense	6,343	5,025	1,318	26.2
Total general and administrative expense	$112,975	$85,013	$27,962	32.9 %

General and administrative expense, excluding stock-based expense and depreciation expense, increased year-over-year by $22.8 million. Professional fees increased year-over-year by $18.9 million, driven by costs related to the Hart-Scott-Rodino review process for our acquisitions of LRO and On-Site, and higher levels of other legal activity. Personnel expense increased $3.2 million between the two periods, primarily reflecting additional headcount from our 2017 acquisitions. The increase in general and administrative expense was partially offset by costs incurred in 2016 related to the relocation of our corporate headquarters and data center which were not incurred in 2017, and a year-over-year decrease of $1.5 million related to sales tax matters.

General and administrative expense as a percentage of total revenue increased from 15.0% to 16.8% during the year ended December 31, 2017, as compared to the same period in 2016. This increase was largely driven by acquisition-related professional fees, as described above. Excluding the costs related to the Hart-Scott-Rodino review process incurred in connection with our acquisitions of LRO and On-Site, general and administrative expense was relatively flat between the periods, at 15.0% in 2016 and 15.2% in 2017.

Amortization of intangible assets

	Year Ended December 31,			
	2017	2016	Change	% Change
	(in thousands)			
Amortization of intangible assets	$17,755	$12,599	$5,156	40.9 %

During the year ended December 31, 2017, amortization expense of intangible assets increased $5.2 million, as compared to the same periods in 2016. Higher amortization expense was primarily driven by the addition of finite-lived client relationship and trade name intangible assets in connection with our recent acquisitions.

Interest Expense and Other, Net

	Year Ended December 31,			
	2017	2016	Change	% Change
	(in thousands)			
Interest expense	$(16,012)	$(3,826)	$(12,186)	318.5 %
Interest income	940	1	939	NM [1]
Other income	303	67	236	352.2
Total interest expense and other, net	$(14,769)	$(3,758)	$(11,011)	293.0 %

(1) not meaningful

Interest expense and other for the year ended December 31, 2017, increased $11.0 million as compared to the same period in 2016. Higher interest and amortization expense, driven by our issuance of the Convertible Notes in May 2017 and borrowings under our Credit Facility in the fourth quarter of 2017, were the largest contributors to this increase.

Provision for Income Taxes

Our effective tax rate was 97.5% and 39.4% for the years ended December 31, 2017 and 2016, respectively. For the year ended December 31, 2017, we recognized a consolidated tax expense of $14.9 million on income before income taxes of $15.2 million. We recognized a domestic income tax expense of $14.3 million, with an effective tax rate of 115.4%. This primarily resulted from (1) the recognition of tax expense of $27.3 million as a result of the Tax Reform Act as described below and (2) a decrease in tax expense of approximately $19.1 million, resulting from excess stock compensation deductions recognized in connection with the vesting of certain restricted stock grants and the exercise of certain stock options in 2017. Prior to our adoption of ASC 2016-09 effective January 1, 2017, the benefit of such stock compensation deductions when realized was recognized in additional paid in capital rather than as a benefit or charge to the tax provision. We incurred foreign income tax expense of $0.5 million with an effective rate of 18.9%. Our foreign effective tax rate is lower than foreign statutory rates primarily because a significant portion of our foreign operations in India and the Philippines occur in tax advantaged economic zones or are subject to statutory tax holidays.

On December 22, 2017, the Tax Reform Act was signed into law making significant changes to the Internal Revenue Code. Changes include, but are not limited to, a corporate tax rate reduction from 35% to 21% effective for tax years beginning after December 31, 2017, the transition of U.S international taxation from a worldwide tax system to a territorial system, and a one-time transition tax on the mandatory deemed repatriation of cumulative foreign earnings as of December 31, 2017. In the fourth quarter of 2017, we recorded additional income tax expense of $27.3 million as a result of the Tax Reform Act. Of this amount, $25.1 million was due to the remeasurement of certain deferred tax assets and liabilities, based on the rates at which they were expected to reverse in the future, and $2.2 million was related to the one-time transition tax on the mandatory deemed repatriation of foreign earnings based on cumulative foreign earnings of $17.7 million.

For further discussion, including a reconciliation of our effective tax rate from the statutory federal rate, see Note 12 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K.

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Quarterly Results of Operations

The following table presents our unaudited consolidated quarterly results of operations for the eight fiscal quarters ended December 31, 2018. This information is derived from our unaudited condensed consolidated financial statements, and includes all adjustments that we consider necessary for the fair statement of our financial position and operating results for the quarters presented. Operating results for individual periods are not necessarily indicative of the operating results for a full year. Historical results are not necessarily indicative of the results to be expected in future periods. You should read this data together with our Consolidated Financial Statements and the related notes to those financial statements included elsewhere in this filing.

Amounts presented below reflect the correction of an immaterial error related to the misclassification of amortization expense on certain acquired intangible assets. Additionally, the amounts below reflect a change in presentation of our Consolidated Statements of Operations to add "Amortization of product technologies" and "Amortization of intangible assets" as separate line items within such statements. Refer to Note 2 of the accompanying Consolidated Financial Statements for further discussion of these items.

	Three Months Ended,							
	December 31, 2018	September 30, 2018	June 30, 2018	March 31, 2018	December 31, 2017	September 30, 2017	June 30, 2017	March 31, 2017
	(in thousands, except per share amounts)							
Revenue:								
On demand	$218,051	$215,413	$206,945	$193,300	$180,104	$161,578	$154,727	$146,213
Professional and other	8,923	9,540	9,307	8,001	7,576	7,480	6,579	6,706
Total revenue	226,974	224,953	216,252	201,301	187,680	169,058	161,306	152,919
Cost of revenue	88,063	85,540	81,942	72,837	69,135	65,794	63,853	59,353
Amortization of product technologies	9,429	8,946	9,127	8,295	7,413	5,497	4,753	4,500
Gross profit	129,482	130,467	125,183	120,169	111,132	97,767	92,700	89,066
Operating expenses:								
Product development	29,772	28,942	30,771	29,040	25,890	21,885	21,290	20,387
Sales and marketing	45,084	43,179	40,664	37,680	37,925	36,802	34,699	31,047
General and administrative	32,638	30,036	28,444	27,090	30,350	31,004	27,370	24,251
Amortization of intangible assets	9,588	9,738	8,496	8,089	7,154	3,838	3,474	3,289
Total operating expenses	117,082	111,895	108,375	101,899	101,319	93,529	86,833	78,974
Operating income	12,400	18,572	16,808	18,270	9,813	4,238	5,867	10,092
Interest expense and other, net	(6,746)	(8,816)	(8,518)	(7,670)	(6,220)	(4,677)	(2,786)	(1,086)
Income (loss) before income taxes	5,654	9,756	8,290	10,600	3,593	(439)	3,081	9,006
Income tax (benefit) expense	(618)	683	(189)	(301)	24,458	(7,273)	(3,132)	811
Net income (loss)	$6,272	$9,073	$8,479	$10,901	$(20,865)	$6,834	$6,213	$8,195
Net income (loss) per share attributable to common stockholders:								

Basic	$0.07	$0.10	$0.10	$0.13	$(0.26)	$0.09	$0.08	$0.10
Diluted	$0.07	$0.09	$0.09	$0.13	$(0.26)	$0.08	$0.08	$0.10

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The following table sets forth our results of operations for the specified periods as a percentage of our revenue for those periods. The period-to-period comparison of financial results is not necessarily indicative of future results.

	Three Months Ended,							
	December 31, 2018	September 30, 2018	June 30, 2018	March 31, 2018	December 31, 2017	September 30, 2017	June 30, 2017	March 31, 2017
	(as a percentage of total revenue)							
Revenue:								
On demand	96.1 %	95.8 %	95.7 %	96.0 %	96.0 %	95.6 %	95.9 %	95.6 %
Professional and other	3.9	4.2	4.3	4.0	4.0	4.4	4.1	4.4
Total revenue	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Cost of revenue	38.8	38.0	37.9	36.2	36.8	38.9	39.6	38.8
Amortization of product technologies	4.2	4.0	4.2	4.1	3.9	3.3	2.9	2.9
Gross profit	57.0	58.0	57.9	59.7	59.3	57.8	57.5	58.3
Operating expenses:								
Product development	13.1	12.9	14.2	14.4	13.8	12.9	13.2	13.3
Sales and marketing	19.9	19.1	18.8	18.7	20.2	21.8	21.5	20.3
General and administrative	14.4	13.4	13.2	13.5	16.2	18.3	17.0	15.9
Amortization of intangible assets	4.1	4.3	4.0	4.0	3.9	2.3	2.1	2.2
Total operating expenses	51.5	49.7	50.2	50.6	54.1	55.3	53.8	51.7
Operating income	5.5	8.3	7.7	9.1	5.2	2.5	3.7	6.6
Interest expense and other, net	(3.0)	(4.0)	(3.9)	(3.8)	(3.3)	(2.8)	(1.7)	(0.7)
Income (loss) before income taxes	2.5	4.3	3.8	5.3	1.9	(0.3)	2.0	5.9
Income tax (benefit) expense	(0.3)	0.3	(0.1)	(0.1)	13.0	(4.3)	(1.9)	0.5
Net income (loss)	2.8 %	4.0 %	3.9 %	5.4 %	(11.1)%	4.0 %	3.9 %	5.4 %

Reconciliation of Quarterly Non-GAAP Financial Measures

The following table presents a reconciliation of net income (loss) to Adjusted EBITDA for the eight fiscal quarters ended December 31, 2018:

	Three Months Ended,							
	December 31, 2018	September 30, 2018	June 30, 2018	March 31, 2018	December 31, 2017	September 30, 2017	June 30, 2017	March 31, 2017
	(in thousands)							
Net income (loss)	$6,272	$ 9,073	$8,479	$10,901	$(20,865)	$ 6,834	$6,213	$8,195
Acquisition-related and other deferred revenue adjustments	1,056	418	103	313	710	698	945	705
Depreciation, asset impairment, and loss on disposal of assets	10,445	9,286	7,662	7,818	6,817	7,331	6,929	6,675
Amortization of product technologies and intangible assets	19,017	18,684	17,623	16,384	14,567	9,335	8,227	7,789
Loss due to cyber incident, net of recoveries	4,952	—	—	—	—	—	—	—
Acquisition-related (income) loss	(257)	519	1,168	1,007	2,508	485	1,354	1,210
Costs related to the Hart-Scott-Rodino review process	—	78	—					