REALPAGE
OUTPERFORM

Annual Report 2019

2019

TO OUR STOCKHOLDERS:

We are in the midst of a significant and historic wave of innovation at RealPage®. In 2019, we released more internal innovations and acquired more external innovators than in any time since our inception. In addition, we simplified our senior management structure, revamped our customer journey process, and expanded beyond our multifamily core business. These pivotal initiatives give us confidence in our goals to reach $1.5 billion in revenue and an annual run rate of $500 million in adjusted EBITDA by 2022.

RealPage empowers the real estate industry with a unique, open and data-rich platform that enhances property managers' operational returns through increased revenue, reduced expenses and lowered risk. Our vision is expanding beyond the operational holding period of an asset to the transactional side of real estate, where we are well positioned to use our data to help optimize the yield on the purchase and sale of an asset. We have the most accurate and comprehensive repository of real-time client data in our industry. This data advantage not only empowers our clients to capture incremental yield but also enables us to build more robust and insightful solutions.

Reflecting on 2019, we brought multiple innovations to market. For example, in December we launched ActiveBuilding® e-commerce, a solution that is purpose-built to enhance the resident experience and drive incremental yield from amenities like spaces, services and events.

In June, we released AI Screening, one of our first self-provision solutions launched from insights from our massive data reservoir. This solution assesses a prospect's ***willingness*** to pay rent—not just their ***ability*** to pay rent—and is expected to become more important as state and local governments impose new rent control measures and restrictions on a landlord's right to evict residents that don't pay their rent on time.

Our 2019 acquisition efforts focused on bolstering our SMB, leasing and marketing, renters insurance and institutional capabilities. We have made great progress in integrating these acquisitions to date.

In December, we expanded our presence in the underpenetrated SMB market with the purchase of Buildium®, the largest acquisition in our company's history. With the strength of Buildium's platform and customer experience, the complementary nature of our platforms, and our shared customer-focused culture, we are well positioned to embrace this significant market opportunity.

When we acquired Hipercept in June, we gained a powerful valuation modeling tool, along with data aggregation and data analytic solutions that became part of our Asset & Investment Management (AIM) platform. In December we added Investor Management Services (IMS) to the AIM platform, providing investor reporting services and a powerful waterfall engine.

We acquired SimpleBills in July to enhance our offering in the utility management space. We are achieving solid early adoption of SimpleBills within our Propertyware® installed base and expect that Buildium clients will embrace this new innovation from RealPage.

The 2019 acquisition cohort drives our opportunity to grow substantially beyond our multifamily core and significantly boosts our TAM estimate, which we now calculate to be $20 billion, up from a previous estimate of $13 billion. We believe the market is significantly underpenetrated, with less than a third of the TAM monetized today. We expect that the market will continue to expand dramatically as owners become more aware of the potential to capture 300 to 400 basis points of incremental yield with technology solutions currently on the market.

Bringing together the market's deepest real-time data reservoir and unmatched domain expertise, RealPage has created more than just a platform—now truly offering a collaborative and proven partnership designed for sustained success. In 2020, we are hyper-focused on improving the customer journey, accelerating innovation, and serving as the strategic and open platform partner to empower our clients to achieve improved yield on their real estate assets. These priorities reflect our North Star values and our ongoing evolution to become an easier company to do business with.

As we turn to 2020, I'd like to acknowledge that these are extraordinary times. But even during the COVID-19 outbreak, our commitment to our stockholders, our teammates and our clients remains steadfast. In the face of the pandemic, our priority is keeping our worldwide workforce safe and productive and being flexible in response to changing conditions. The team at RealPage has reacted quickly and effectively to serve our clients with solutions that enable them to adapt to this new and unpredictable business environment, and I am proud of the resiliency of our company.

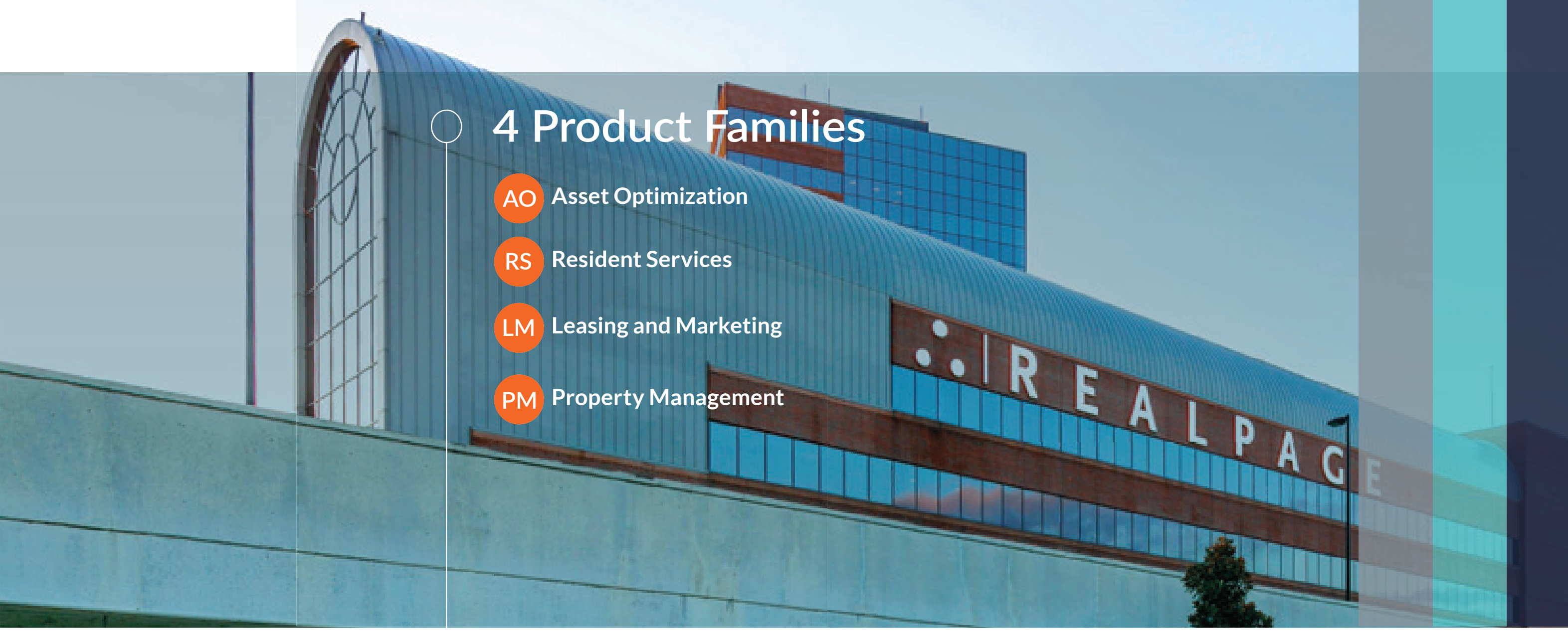
Looking forward, we are well capitalized and well positioned to deliver on solutions that support our customers in these challenging times and make us even more critical to their success. I am confident we will emerge a better, stronger and wiser market leader. Now more than ever, I am grateful for your support in this journey.

Sincerely,

Steve Winn

Steve Winn
Chairman & Chief Executive Officer

2019 Non-GAAP On-Demand Revenue by Product Family[(1)]



4 Product Families

- **AO** Asset Optimization
- **RS** Resident Services
- **LM** Leasing and Marketing
- **PM** Property Management

Asset Optimization

2017	$83M	
2018	$131M	
2019	$147M	12% Growth

Leasing and Marketing

2017	$124M	
2018	$167M	
2019	$180M	7% Growth

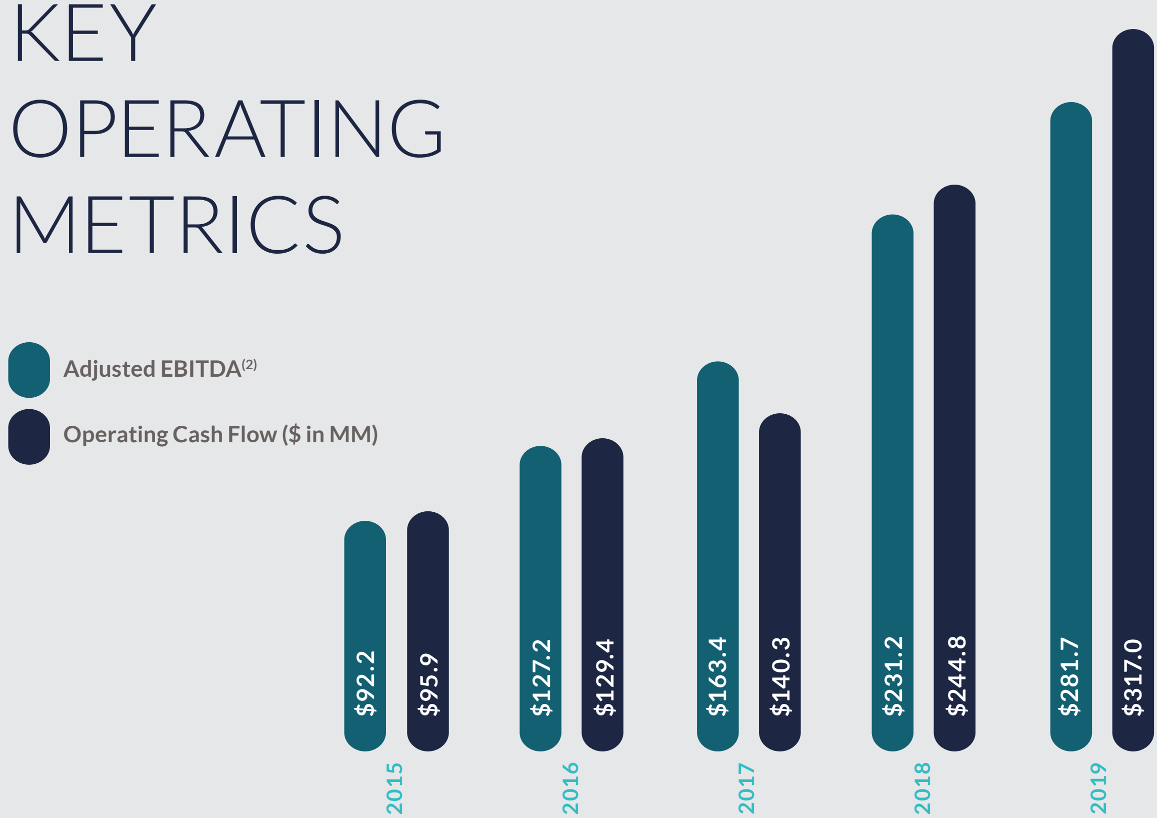
Resident Services

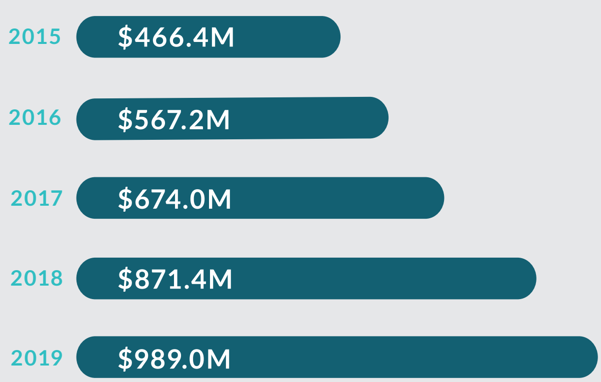
2017	$272M	
2018	$350M	
2019	$421M	20% Growth

Property Management

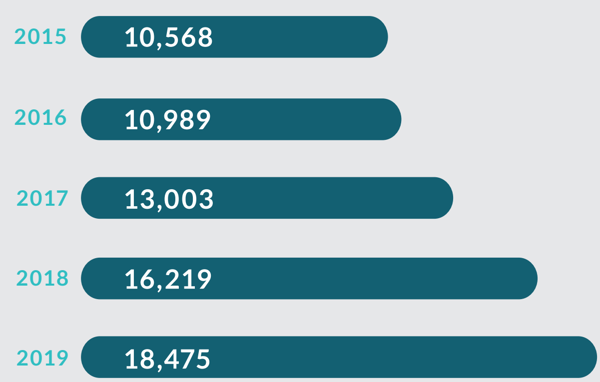
2017	$167M	
2018	$187M	
2019	$206M	10% Growth

KEY OPERATING METRICS





Non-GAAP Total Revenue[1][2] ($ in MM) 4-Year CAGR: 21%



Ending On-Demand Rental Units (000's) 4-Year CAGR: 15%

(1) Acquisition-related deferred revenue for the years ended December 31, 2019, 2018, 2017, 2016, and 2015.
(2) See discussion and reconciliation of Non-GAAP Total Revenue and Adjusted EBITDA to GAAP Total Revenue and GAAP Net Income included within the Annual Report on Form 10-K filed with the SEC on March 2, 2020.

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

FORM 10-K

(Mark One)

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

For the fiscal year ended December 31, 2019

or

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

For the transition period from __________ to __________

Commission File Number: 001-34846

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:

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

Securities registered pursuant to Section 12(g) of the Act:
None

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

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

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

Indicate by 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 ☒ No ☐

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

Large accelerated filer	☒	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 ☒

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, 2019, the aggregate market value of its shares held by non-affiliates on that date was approximately $4,720,745,556. On February 14, 2020, 94,689,393 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 2020 Annual Meeting of Stockholders to be filed within 120 days of the Registrant's fiscal year ended December 31, 2019 are incorporated by reference into Part III of this Annual Report on Form 10-K where indicated. The discussion of historical items and year-to-year comparisons between 2018 and 2017 in "Management's Discussion and Analysis of Financial Condition and Results of Operations" in the Registrant's Annual Report on Form 10-K for the fiscal year ended December 31, 2018, filed with the SEC on February 27, 2019 and amended on November 5, 2019, are incorporated by reference into Part II of this Annual Report on Form 10-K.

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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 similar expressions 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 $988.1 million, $869.5 million, and $671.0 million for the years ended December 31, 2019, 2018, and 2017, respectively. In the same periods, we had operating income of approximately $92.4 million, $66.1 million, and $30.0 million, respectively, and net income of approximately $58.2 million, $34.7 million, and $0.4 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 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, associations (homeowner and condominium), commercial, hospitality, and vacation rental markets. In addition, since July 2002, we have completed over 45 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 real estate market is large, growing, and complex.

The 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, a wide range of multifamily property types, including conventional, affordable, privatized military, student, and senior housing, associations, and vacation rental markets. We estimate that the total addressable market for our current portfolio of data analytics and on demand software solutions is approximately $18.9 billion across approximately 64.6 million units.

According to the U.S. Census Bureau American Housing Survey for the United States, there were 44.6 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 $580.0 billion annually. We estimate that the total addressable market for our current data analytics and on demand software solutions is approximately $16.1 billion per year. This estimate assumes that each of the 44.6 million rental units in the United States has the potential to generate annually a range of approximately $310 in revenue per unit for single family units to approximately $500 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 $510 in revenue per unit, and affordable housing markets will generate annually approximately $300 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 associations market, including the homeowner’s associations (“HOA”) and condominium markets, is estimated to contain over 18.0 million units and we estimate that the total addressable market for our solutions is approximately $1.8 billion per year. This estimate assumes that each of the 18.0 million units managed has the potential to generate annual revenue per unit of $100. 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 associations market.

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 $1.0 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 $500. 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.

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 $3.7 trillion of apartment stock in the U.S., turning over at a rate of approximately $180.0 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.

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 have 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, 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, 2019, our client base of over 29,800 clients used one or more of our integrated data analytics or on demand software solutions to help manage the operations of approximately 18.5 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.

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 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 45 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 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 45 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, workflow, 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.

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;
- vacation rentals; and
- institutional.

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, Buildium, 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.

Buildium

Buildium is our on demand property management solution for the small and medium-size ("SMB") market segment, which includes small multifamily, single-family, associations (HOA and condo) and commercial real estate market segments. Buildium provides easy-to-use customer support and rapid self-provisioning. We acquired Buildium in 2019 to expand this platform, incorporating "click-on" capabilities that (i) improve the renter leasing and living experience, (ii) improve the recovery of utility fees, (iii) enhance payment processing capabilities, (iv) enhance risk management through resident screening capabilities, and (v) expand insurance offerings.

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, AI 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.

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.

AI Resident Screening

Screening is part of our risk mitigation platform to reduce rental payment delinquency. RealPage AI Screening, the first AI-based screening algorithm built specifically for the multifamily industry, enables property management companies to identify high-risk renters with greater accuracy and speed that exceeds the performance of traditional scoring models in the industry. The AI Screening algorithm combines data-derived renter insights, machine learning techniques, RealPage's massive, proprietary database of renter outcomes and consumer financial data to more precisely predict a renter's financial performance over the course of a lease. The model delivers proven reduction of bad debt and financial loss to owners and operators without negative impact to occupancy or revenue.

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, SimpleBills, Resident Payments, ActiveBuilding, 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.

SimpleBills

SimpleBills is our on demand utility management solution dedicated to the student housing market. We acquired SimpleBills in 2019 to expand our Resident Utility Management family of products. SimpleBills' solution bills and collects from residents directly, allowing students to split water, electric, gas, cable bills and other shared utilities among roommates, as well as manage their utilities easily without paying deposits, utility provider setup fees, or contacting providers. Because of SimpleBills' direct relationship with students, (i) properties can experience significant time savings, as site staff can avoid tedious billing tasks, and (ii) RealPage can deploy it independently of any student solutions companies already use, saving the time and expense of integration. Companies can then fully outsource their utility needs to RealPage.

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.

ActiveBuilding

ActiveBuilding is our on demand resident portal solution for facilitating renter transactions, social engagement, and community management. The solution features an industry-specific eCommerce platform that allows residents to pay for amenities, spaces and events directly, enabling multifamily property managers to generate revenue from their existing assets and through third-party service providers. Transactions are facilitated by a mobile app, custom-branded to the property, that enables residents to make purchases and manage apartment-related needs easily and conveniently. The solution provides additional benefits to property management companies including an increased likelihood of resident lease renewal and freeing of staff time as a result of residents performing more apartment-related tasks on their own.

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. We also offer insurance and security deposit alternative products that satisfy lease obligations through DepositIQ, obtained in the On-Site Manager acquisition in 2017, and LeaseTerm Solutions which we acquired in 2019.

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 ("AIM") is an integrated analytics and visualization platform providing stakeholders in the private and public capital markets with increased transparency into their investment portfolios. AIM is the integrated platform stemming from the acquisitions of AssetEye in 2016, Hipercept and Investor Management Services ("IMS") in 2019, as well as internal RealPage development efforts. The platform is comprised of five key capabilities, including Investment Management, Asset Management, Asset Modeling, Business Intelligence, and Investor Reporting. These five capabilities are anchored by a common global data warehouse that leverages a unified data structure to align stakeholders in the investment ecosystem to collect, share, analyze, and report on performance of the investment, portfolio, and asset.

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.

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 8,500 virtual servers, 800 physical servers and 14.5 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, 2019, we employed approximately 250 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 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, 2019, our product development group consisted of approximately 650 employees in the United States and 790 employees located primarily in Hyderabad, India; Manila, Philippines; and Cebu City, Philippines. Product development expense totaled $112.2 million, $118.5 million and $89.5 million during the years ended December 31, 2019, 2018, and 2017, 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;
- 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, 2019, we had over 29,800 clients who used one or more of our on demand software solutions to help manage the operations of approximately 18.5 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, 2019 by the NMHC, based on number of units managed. For the years ended December 31, 2019, 2018 and 2017, no one client accounted for more than 10% of our revenue. Revenues for our largest client were 6.1%, 5.9%, and 6.2% of total revenues for the years ended December 31, 2019, 2018, and 2017, 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.

Employees

As of December 31, 2019, we had approximately 7,000 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 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”), the Health Information Technology Economic and Clinical Health Act (“HITECH”), and state and local laws related to rent control or regulation;
- 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 7,000 employees and over 29,800 on demand clients as of December 31, 2019. 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.

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 Modern Message, Buildium, IMS, Simple Bills, Hipercept, LeaseTerm Solutions, Rentlytics, LeaseLabs, BluTrend, and ClickPay. 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;
- 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;
- 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 certain of our acquired companies' 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 or other factors 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 and our own processes related 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.

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 the third quarter of 2019, we entered into an Amended and Restated Credit Agreement (the "Amended Credit Facility"), and we had also entered into an amendment to our prior credit facility in the first quarter of 2018, each of which increased our borrowing capacity. 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 Amended 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 Amended 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 Amended 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 Amended 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 Amended 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 9 to the Consolidated Financial Statements under Item 8 of this Annual Report on Form 10-K. As of December 31, 2019, we were in compliance with all of the covenants under our Amended Credit Facility.

The Amended 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 Amended Credit Facility was terminated, additional debt we could incur in the future may subject us to similar or additional covenants.

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 Amended Credit Facility. If we are unable to generate sufficient cash flow or otherwise obtain the funds necessary to make required payments under our Amended Credit Facility or Convertible Notes Indenture, or if we fail to comply with the requirements of our indebtedness, we could default under our Amended 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 Amended Credit Facility or Convertible Notes Indenture, an increase in the applicable interest rate under the Amended Credit Facility and a requirement that our subsidiaries that have guaranteed the Amended 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 Amended 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 remediate our material weakness or 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, 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. This material weakness was remediated during the quarter ended June 30, 2018.

During 2019 and subsequent to the filing of our Annual Report on Form 10-K for the fiscal year ended December 31, 2018, the Public Company Accounting Oversight Board ("PCAOB") conducted an inspection of Ernst & Young LLP's ("EY") audit of our consolidated financial statements for the year ended December 31, 2018. In connection with this inspection, EY performed additional testing related to certain controls pertaining to our information technology ("IT") systems and subsequently requested a reevaluation by management of those controls. As a result of this reevaluation, management identified, and we concluded, that certain individual control deficiencies over our information technology general controls ("ITGCs"), when viewed in combination, aggregated to a material weakness as of December 31, 2018. The material weakness did not result in any financial statement modifications and there have been no changes to our previously disclosed financial results. Upon identifying the individual control deficiencies, our management has been taking actions to remediate the deficiencies that in combination resulted in a material weakness and to improve the design and effectiveness of our ITGCs. We have completed certain of the remediation activities as of the date of this report and believe that we have strengthened our ITGCs to address the identified material weakness. However, control weaknesses are not considered remediated until new internal controls have been operational for a period of time, are tested, and management concludes that these controls are operating effectively. We will continue to monitor the effectiveness of these remediation measures and we will make any changes to the design of this plan and take such other actions that we deem appropriate given the circumstances. We expect to complete the remediation process as early as practicable in 2020.

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.

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.

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 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.

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.

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.

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; Manila, Philippines; and Medellin, Colombia, 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, Manila, and Medellin 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, including quarantines or other interruptions that affect our workforce as a result of an outbreak of the coronavirus in any of the locations where we operate, 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. 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 our ability to attract or maintain clients.

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.

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. 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;
- 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 have 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 provider. 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.

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.

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 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. 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 that our business practices did not, and do not, violate the FCRA or any other laws.

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. 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 are currently involved in a dispute 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. 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.

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 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 law. 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 created 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.

Increased regulation is also likely in states and local jurisdictions related to rent control and rent regulation. During 2019, California, New York and Oregon each adopted state legislation that regulates rent pricing, and other states and municipalities are considering similar legislation. Such legislation impacts our clients' businesses as they determine rental rates, and could impact the supply of rental units over time in markets impacted by such regulation. The impact of restrictions on rental rates could also depress demand and pricing for certain of our products designed to enable our clients to evaluate market conditions in determining rental rates.

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.

Our 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 insurance business. In addition, we have appointed numerous sub-producing agents to generate insurance business for our products. These sub-producing agents primarily consist of property owners and managers who market insurance products 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 our insurance 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 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 insurance business or fined or penalized in a given jurisdiction. No assurances can be given that our 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 14.5% of our common stock as of December 31, 2019. 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 13.3% of our common stock as of December 31, 2019. 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, 2019. This concentration of ownership may adversely affect the trading price of our common stock because investors often perceive disadvantages in owning stock in companies with large 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;
- 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;
- 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. 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 of awards under our equity plan, 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.

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, 2019, 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 (with two 5-year renewal options). We also lease office space in a variety of other areas. These locations include, among others, the following: Irvine, California; San Diego, California; Lombard, Illinois; Boston, Massachusetts; Hackensack, New Jersey; Greenville, South Carolina; Hyderabad, India; Cebu, Philippines; and Manila, Philippines. 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 did 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 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.

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 14, 2020, there were approximately 311 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.

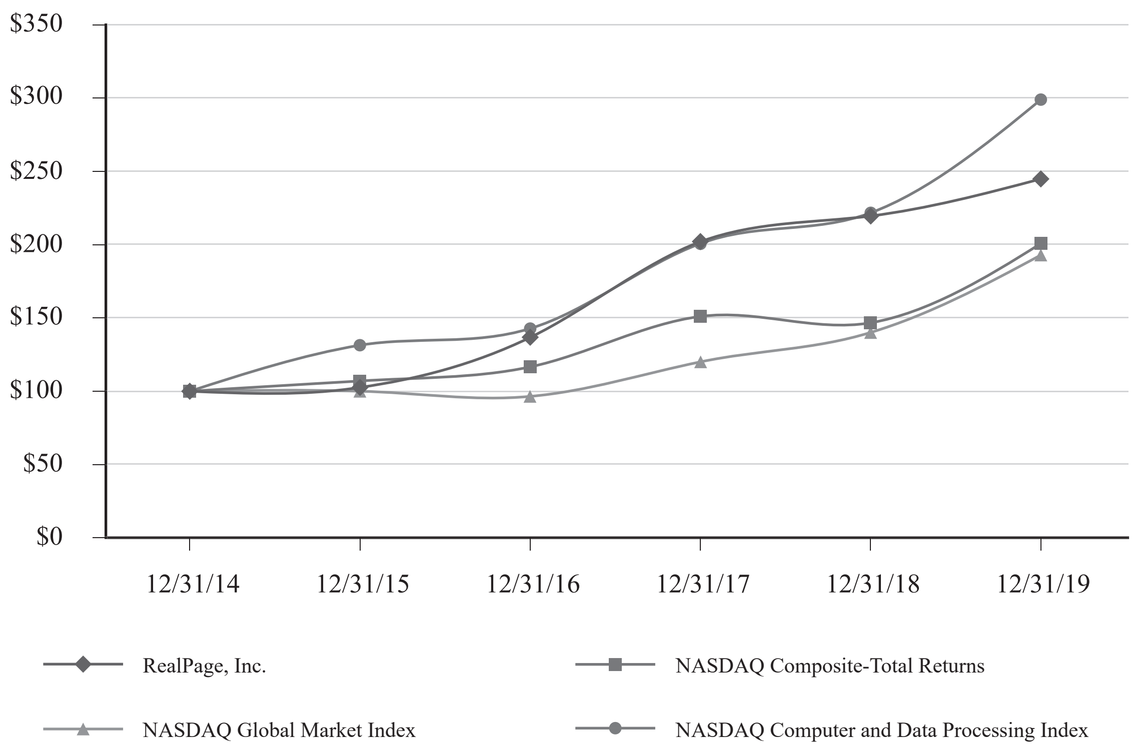
Dividend Policy

We have neither declared nor paid any cash dividends on our common stock in recent fiscal years. We do not expect to pay cash dividends on our common stock for the foreseeable future. Instead, we anticipate that all of our earnings will be used for the operation and growth of the business. Any future determination to declare cash dividends would be subject to the discretion of our board of directors and would depend upon various factors, including our results of operations; financial condition and liquidity requirements; restrictions that may be imposed by applicable law and our contracts; and other factors deemed relevant by our board of directors.

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, 2014 through December 31, 2019. In each case, this graph assumes a $100 investment on the last trading day of the fiscal year ended December 31, 2014 (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.

Comparison of 5 Year Cumulative Total Return
Assumes Initial Investment of $100
December 31, 2019



	December 31, 2014	December 31, 2015	December 31, 2016	December 31, 2017	December 31, 2018	December 31, 2019
RealPage, Inc.	$ 100.00	$ 102.23	$ 136.61	$ 201.73	$ 219.45	$ 244.77
NASDAQ Composite—Total Returns	100.00	106.96	116.45	150.96	146.67	200.50
NASDAQ Global Market Index	100.00	99.99	96.13	119.95	139.76	192.69
NASDAQ Computer and Data Processing Index	100.00	131.10	142.54	200.79	221.52	299.00

Issuer Purchases of Equity Securities

The following table provides information with respect to repurchases of our common stock made during the fourth quarter of 2019 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, 2019 through October 31, 2019	—	$ —	—	$ 100,000,000
November 1, 2019 through November 30, 2019	133,758	53.35	133,758	92,864,176
December 1, 2019 through December 31, 2019	25,213	53.73	25,213	91,509,457
Total	158,971	$ 53.41	158,971	$ 91,509,457

(1) In October 2018, our board of directors approved a share repurchase program authorizing the repurchase of up to $100.0 million of our outstanding common stock. The share repurchase program expired on October 25, 2019. In November 2019, 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 November 7, 2020.

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 of the 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.

	Year Ended December 31,				
	2019	2018	2017	2016	2015
	(in thousands, except per share data)				
Revenue:					
On demand	$ 953,576	$ 833,709	$ 642,622	$ 542,531	$ 450,962
Professional and other	34,560	35,771	28,341	25,597	17,558
Total revenue	988,136	869,480	670,963	568,128	468,520
Cost of revenue	385,712	328,382	258,135	225,539	184,400
Amortization of product technologies	40,461	35,797	22,163	17,669	14,213
Gross profit	561,963	505,301	390,665	324,920	269,907
Operating expenses:					
Product development	112,222	118,525	89,452	73,607	68,799
Sales and marketing	193,962	166,607	140,473	122,457	111,944
General and administrative	123,056	118,208	112,975	85,013	68,814
Amortization of intangible assets	40,303	35,911	17,755	12,599	11,164
Impairment of intangible assets	—	—	—	—	20,801
Total operating expenses	469,543	439,251	360,655	293,676	281,522
Operating income (loss)	92,420	66,050	30,010	31,244	(11,615)
Interest expense and other, net	(31,862)	(31,750)	(14,769)	(3,758)	(1,449)
Income (loss) before income taxes	60,558	34,300	15,241	27,486	(13,064)
Income tax expense (benefit)	2,350	(425)	14,864	10,836	(3,846)
Net income (loss)	$ 58,208	$ 34,725	$ 377	$ 16,650	$ (9,218)
Net income (loss) per share attributable to common stockholders:					
Basic	$ 0.63	$ 0.40	$ 0.00	$ 0.22	$ (0.12)
Diluted	$ 0.60	$ 0.38	$ 0.00	$ 0.21	$ (0.12)
Weighted average common shares outstanding:					
Basic	92,017	87,290	79,433	76,854	76,689
Diluted	96,282	91,531	82,398	77,843	76,689

	Year Ended December 31,				
	2019	2018	2017	2016	2015
	(in thousands, except client and employee data)				
Consolidated Balance Sheet Data:					
Cash and cash equivalents[1]	$ 197,154	$ 228,159	$ 69,343	$ 104,886	$ 30,911
Total current assets	$ 635,530	$ 540,753	$ 308,579	$ 297,455	$ 221,943
Total assets[2]	$ 2,969,817	$ 2,097,773	$ 1,516,293	$ 788,098	$ 623,201
Total current liabilities	$ 525,344	$ 412,232	$ 332,907	$ 250,527	$ 215,347
Total deferred revenue	$ 138,941	$ 125,606	$ 122,160	$ 95,891	$ 91,179
Current and long-term debt[2]	$ 1,129,251	$ 596,572	$ 648,818	$ 122,429	$ 40,292
Total liabilities[2]	$ 1,796,891	$ 1,034,749	$ 1,014,418	$ 403,335	$ 296,749
Total stockholders' equity	$ 1,172,926	$ 1,063,024	$ 501,875	$ 384,763	$ 326,452
Other Financial Data:					
Adjusted EBITDA[3]	$ 281,685	$ 231,176	$ 163,445	$ 127,210	$ 92,191
Operating cash flow	$ 316,973	$ 244,807	$ 140,263	$ 129,449	$ 95,390
Capital expenditures	$ 51,500	$ 50,933	$ 49,752	$ 75,241	$ 33,384
Selected Operating Data:					
Number of on demand clients at period end	29,814	12,266	12,414	11,042	11,998
Number of on demand units at period end	18,475	16,219	13,003	10,989	10,568
Total number of employees at period end	7,085	6,267	5,462	4,410	4,122

(1) Excludes restricted cash.

(2) We adopted ASU 2016-02, *Leases (Topic 842)* effective January 1, 2019. We used the optional transition method described in the *Recently Adopted Accounting Standards* section of Note 2, which eliminated the requirement to restate amounts presented prior to January 1, 2019. For periods prior to 2019, Current and long-term debt includes capital lease obligations in accordance with our historic accounting under ASC Topic 840. For 2019, Total assets include $121.9 million of right-of-use assets, and Total liabilities include $149.4 million of lease liabilities.

(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,				
	2019	2018	2017	2016	2015
			(in thousands)		
Net income (loss)	$ 58,208	$ 34,725	$ 377	$ 16,650	$ (9,218)
Acquisition-related deferred revenue	868	1,890	3,058	(949)	(2,157)
Depreciation, asset impairment, and loss on disposal of assets	36,724	35,211	27,752	25,813	44,385
Amortization of product technologies and intangible assets	80,764	71,708	39,918	30,268	25,377
Change in fair value of equity investment	(2,600)	—	—	—	—
Loss due to cyber incident, net of recoveries	—	4,952	—	—	—
Acquisition-related expense (income)	4,754	2,437	5,557	363	(1,841)
Organizational realignment	1,533	—	—	—	—
Regulatory and legal matters	1,465	78	11,012	—	2
Headquarters relocation costs	—	—	—	3,552	—
Stock-based expense	62,563	50,641	45,835	36,852	38,122
Interest expense, net	35,056	29,959	15,072	3,825	1,367
Income tax expense (benefit)	2,350	(425)	14,864	10,836	(3,846)
Adjusted EBITDA	$ 281,685	$ 231,176	$ 163,445	$ 127,210	$ 92,191

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 96.5%, 95.9%, and 95.8% of our total revenue during 2019, 2018, and 2017, 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 $869.5 million in 2018 to $988.1 million in 2019. The increase in revenue was driven by growth in the sales of our on demand software solutions and incremental revenue from our recent acquisitions.

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 45 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, 2019, we had approximately 7,000 employees.

Recent Developments

Credit Facility

In September 2019, we entered into an Amended and Restated Credit Agreement (the "Amended Credit Facility") to amend and restate our prior credit facility. The Amended Credit Facility provides for $600.0 million in aggregate commitments for secured revolving loans and up to $600.0 million in term loans. The Amended Credit Facility extends the maturity date of the prior credit facility from February 27, 2022 to September 5, 2024 (subject to early maturity provisions in certain circumstances), reduces our borrowing costs, provides additional borrowing capacity, and increases covenant flexibility.

The Amended Credit Facility also allows us, subject to certain conditions, to request additional term loan commitments and/or additional revolving commitments in an aggregate principal amount of up to the greater of $250.0 million or 100% of consolidated EBITDA (as defined within the agreement) for the most recent four fiscal quarters, plus an amount that would not cause our consolidated senior secured net leverage ratio to exceed 3.50 to 1.00.

Refer to Note 9 of the accompanying Consolidated Financial Statements for applicable definitions, further discussion of this amendment, and other terms and conditions of the Credit Facility.

Acquisition Activity

In November 2019, we entered into an Agreement and Plan of Merger and Stock Purchase Agreement (the "Merger Agreement"), by and among RealPage, Buildium, LLC ("Buildium"), and certain other parties named therein. We closed the transaction on December 18, 2019. Buildium is a SaaS real estate property management solution provider that targets the smaller multifamily, single-family, associations (homeowner and condominium) and commercial real estate market segments. Aggregate purchase consideration was $569.4 million, including deferred cash obligations of up to $3.4 million that will be released on the one year anniversary following the closing date, subject to any indemnification claims. The purchase agreement provides for up to $11.7 million of deferred compensation for key employees for which post-acquisition employment service is required. The deferred compensation was paid into escrow at closing and recorded as a prepaid asset that will amortize into compensation expense ratably over the two-year term of the arrangement. The funds will be released 50% on each of the first and second year anniversary dates of the acquisition. In addition, the purchase agreement provides for up to $15.0 million of restricted stock awards, which may be settled in stock or cash at our choosing, to be issued or settled at a future date and for which post-acquisition employment service is required. The $15.0 million of restricted stock awards are comprised of 1) up to $7.5 million of restricted stock with service requirements that will be issued on the first anniversary date and vest ratably beginning the subsequent quarter over the following twelve quarters, and 2) up to $7.5 million of restricted stock awards contingent on the achievement of performance targets in 2022. As these awards also require continued employment services, we will record this amount as stock-based compensation expense over the requisite service period, recognizing a corresponding fair value liability that will be reclassified to additional paid-in-capital upon issuance or settled in cash.

On December 11, 2019, we entered into an Agreement and Plan of Merger whereby we acquired 100% of the ownership interests of Investor Management Services, LLC ("IMS"). IMS provides an investor relationship management platform. Aggregate purchase consideration was $55.6 million, including deferred cash obligations of up to $5.7 million that will be released over an eighteen-month period following the closing date, subject to any indemnification claims.

On July 26, 2019, we acquired substantially all of the assets of Simple Bills Corporation ("Simple Bills"), a provider of utility management services for the multi-family student housing market. Aggregate purchase consideration was $18.1 million, including deferred cash obligations of up to $3.4 million that will be released over a two-year period following the closing date, subject to indemnification claims, and contingent equity grants of up to $10.0 million based on the achievement of certain financial objectives during 2020 and 2021, and continued employment of certain Simple Bills employees.

On July 10, 2019, we acquired substantially all of the assets of CRE Global Enterprises LLC ("CRE"), and certain of its subsidiaries, including 100% of the shares outstanding in its subsidiaries in the UK, Canada and Colombia (collectively "Hipercept"). Hipercept is a provider of data services and data analytics solutions to institutional commercial real estate owners. Aggregate purchase consideration was $28.3 million, including deferred cash obligations of up to $4.0 million, subject to any indemnification claims, to be released on the first and second anniversary dates of the closing date, and contingent consideration of up to $28.0 million based on the achievement of certain financial objectives during the six months ended June 30, 2022.

On April 11, 2019, we acquired substantially all of the assets of LeaseTerm Insurance Group, LLC ("LeaseTerm Solutions"). Aggregate purchase consideration was $26.5 million, including deferred cash obligations of up to $2.7 million that will be released on the first and second anniversary dates of the closing date, subject to any indemnification claims.

Refer to Note 3 of the accompanying Consolidated Financial Statements for further discussion of these acquisitions.

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,		
	2019	2018	2017
	(in thousands, except dollar per unit data)		
Revenue:			
Total revenue	$ 988,136	$ 869,480	$ 670,963
On demand revenue	$ 953,576	$ 833,709	$ 642,622
On demand revenue as a percentage of total revenue	96.5%	95.9%	95.8%
Non-GAAP total revenue	$ 989,004	$ 871,370	$ 674,021
Non-GAAP on demand revenue	$ 954,444	$ 835,599	$ 645,680
Adjusted EBITDA	$ 281,685	$ 231,176	$ 163,445
Ending on demand units	18,475	16,219	13,003
Average on demand units	16,758	14,847	11,711
On demand annual client value	$ 1,039,588	$ 876,637	$ 751,183
On demand revenue per ending on demand unit	$ 56.27	$ 54.05	$ 57.77

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 deferred revenue to total revenue. We believe it is useful to include deferred revenue written down for GAAP purposes under purchase accounting rules 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 because it provides a more accurate depiction of revenue arising from our strategic acquisitions.

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

	Year Ended December 31,		
	2019	2018	2017
		(in thousands)	
Total revenue	$ 988,136	$ 869,480	$ 670,963
Acquisition-related deferred revenue	868	1,890	3,058
Non-GAAP total revenue	$ 989,004	$ 871,370	$ 674,021

Non-GAAP on demand revenue: This metric reflects total on demand revenue plus acquisition-related deferred revenue, 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 arising from our strategic acquisitions.

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

	Year Ended December 31,		
	2019	2018	2017
		(in thousands)	
On demand revenue	$ 953,576	$ 833,709	$ 642,622
Acquisition-related deferred revenue	868	1,890	3,058
Non-GAAP on demand revenue	$ 954,444	$ 835,599	$ 645,680

Adjusted EBITDA: We define Adjusted EBITDA as net income, plus (1) acquisition-related deferred revenue, (2) depreciation, asset impairment, and the loss on disposal of assets, (3) amortization of product technologies and intangible assets, (4) change in fair value of equity investment, (5) loss due to cyber incident, net of recoveries, (6) acquisition-related expense, (7) organizational realignment costs, (8) regulatory and legal matters, (9) stock-based expense, (10) interest expense, net, and (11) income tax expense (benefit). 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,		
	2019	2018	2017
		(in thousands)	
Net income	$ 58,208	$ 34,725	$ 377
Acquisition-related deferred revenue	868	1,890	3,058
Depreciation, asset impairment, and loss on disposal of assets	36,724	35,211	27,752
Amortization of product technologies and intangible assets	80,764	71,708	39,918
Change in fair value of equity investment	(2,600)	—	—
Loss due to cyber incident, net of recoveries	—	4,952	—
Acquisition-related expense	4,754	2,437	5,557
Organizational realignment	1,533	—	—
Regulatory and legal matters	1,465	78	11,012
Stock-based expense	62,563	50,641	45,835
Interest expense, net	35,056	29,959	15,072
Income tax expense (benefit)	2,350	(425)	14,864
Adjusted EBITDA	$ 281,685	$ 231,176	$ 163,445

Ending on demand units: This metric represents the number of 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 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 property 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 property 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 property units.

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 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 deferred revenue: These items are included to reflect deferred revenue written down for GAAP purposes under purchase accounting rules 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 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 is 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.

Change in fair value of equity investment: This item represents changes in fair value of our equity investment based on observable price changes in orderly transactions for an identical or similar investment of the same issuer. We believe exclusion of these items facilitates a more accurate comparison of our results of operations between periods as this item is not reflective of our ongoing operations.

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 expenses related to integration activities, and the impact of changes in the fair value of acquisition-related contingent consideration obligations. Examples of these direct costs include transaction fees, due diligence costs, acquisition retention bonuses and severance, and third-party consultants to assist with integration. 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.

Organizational realignment: These items consist of direct costs associated with the alignment of our business strategies. In connection with these actions, we recognize costs related to termination benefits, exit costs associated with closure of facilities, certain asset impairments, cancellation of certain contracts, and other professional and consulting fees associated with these initiatives. We believe exclusion of these items facilitates a more accurate comparison of our ongoing results of operations between periods.

Regulatory and legal matters: These items are comprised of certain regulatory and similar costs and certain legal settlement costs, such as costs related to the company's Hart-Scott-Rodino Antitrust Improvements Act review process incurred in connection with our acquisitions or the settlement of certain legal matters. These items are excluded as they are irregular in timing and scope, and may not be indicative of our past and future performance. We believe exclusion of these items facilitates a more accurate comparison of the company's results of operations between periods.

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

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; transaction processing fees; 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 four primary categories: product development, sales and marketing, general and administrative, and amortization of intangible assets. 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 facilities costs, overhead costs, and depreciation based on headcount for the 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; Medellin, Colombia; 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 Amended Credit Facility, Convertible Notes, finance 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. We estimate and accrue a reserve for credits and other adjustments as a reduction to revenue based on several factors, including past history.

On Demand Revenue

Our on demand revenue consists of license and subscription fees, transaction and payment processing 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 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" in the accompanying Consolidated Balance Sheets.

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 beginning in 2018. As a result, there was a net benefit to "Operating income" in our Consolidated Statements of Operations during 2018 as capitalization of costs exceeded amortization. This accretive benefit was reduced in 2019 and will normalize in 2020.

As of December 31, 2019, 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 $9.9 million and $8.5 million, respectively. As of December 31, 2018, the current and noncurrent balance of capitalized commissions costs was $6.7 million and $7.8 million, respectively. During the years ended December 31, 2019 and 2018, we amortized commission costs totaling $8.7 million and $5.4 million, respectively, 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. The fair value of our deferred restricted stock awards is based on obligations denominated in fixed dollar amounts and our expectation of future operating results and the specific performance criteria within each agreement. 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 changes are 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. Qualitative factors include industry and market considerations, overall financial performance, and other relevant events and circumstances affecting the reporting unit. 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. Our quantitative impairment assessment utilizes a weighted combination of a discounted cash flow model (known as the income approach) and comparisons to publicly traded companies engaged in similar businesses (known as the market approach). These approaches involve judgmental assumptions, including forecasted future cash flows expected to be generated by the business over an extended period of time, long-term growth rates, the identification of comparable companies, and our discount rate based on our weighted average cost of capital. These assumptions are predominately unobservable inputs and considered Level 3 measurements. 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. Key assumptions for this assessment include forecasted future cash flows from estimated royalty rates and our discount rate based on our weighted average cost of capital. These assumptions are unobservable Level 3 measurements, as described in Note 14 of our Consolidated Financial Statements. 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 would recognize an impairment loss equal to the excess of carrying value over fair value.

Internally Developed Software

Costs incurred to develop software intended for our internal use are capitalized during the application development stage. Capitalization of such costs ceases once the project is substantially complete and ready for its intended use. We also capitalize costs related to specific upgrades and enhancements when it is probable the expenditure will result in additional functionality. Costs related to preliminary project activities and post-implementation operating activities are expensed as incurred.

Amortization of internally developed software is included in "Amortization of product technologies" in the accompanying Consolidated Statements of Operations.

Recent Accounting Pronouncements

We adopted ASU 2016-02, *Leases (Topic 842),* on January 1, 2019 using the optional transition method provided for in ASU 2018-11 *Leases - Targeted Improvements* which eliminated the requirement to restate amounts presented prior to January 1, 2019. The adoption of ASC 842 resulted in the recognition of ROU assets and lease liabilities for operating leases of $73.9 million and $101.5 million, respectively at the Transition Date which included reclassifying deferred rent as a component of the ROU asset. As of the Transition Date, we had insignificant finance leases.

We determine if an arrangement contains a lease and the classification of that lease, if applicable, at inception. Our ROU assets and lease liabilities are recognized at the lease commencement date based on the present value of lease payments over the lease term. For our real estate contracts with lease and non-lease components, we have elected to combine the lease and non-lease components as a single lease component. The implicit rate within our leases are generally not determinable and we use our incremental borrowing rate at the lease commencement date to determine the present value of lease payments. The determination of our incremental borrowing rate requires judgment. We determine our incremental borrowing rate for each lease using our current borrowing rate, adjusted for various factors including collateralization and term to align with the terms of the lease.

Certain of our leases include options to extend the lease. An option to extend the lease is considered in connection with determining the ROU asset and lease liability when it is reasonably certain we will exercise that option. During the first quarter of 2019, we determined we were reasonably certain to renew the building lease for our corporate headquarters, and as a result, we reassessed the classification of the lease and determined the building lease met the criteria of a finance lease under ASC 842. As a result, an operating ROU asset and lease liability of $36.4 million and $58.6 million, respectively, were reclassified and remeasured to a finance ROU asset and lease liability of $58.2 million and $80.4 million, respectively. As a result, the costs associated with this lease are now recognized in depreciation and interest expense in 2019. Such costs were included in rent expense in 2018.

See Note 2 "Summary of Significant Accounting Policies" to our Consolidated Financial Statements for additional 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 following generally discusses 2019 and 2018 items and year-to-year comparisons between 2019 and 2018. The discussion of historical items and year-to-year comparisons between 2018 and 2017 can be found in "Management's Discussion and Analysis of Financial Condition and Results of Operations" in our Annual Report on Form 10-K for the fiscal year ended December 31, 2018, filed with the SEC on February 27, 2019 and amended on November 5, 2019, and incorporated by reference herein. The period-to-period comparison of financial results is not necessarily indicative of future results.

Consolidated Statements of Operations Data

	Year Ended December 31,		
	2019	2018	2017
		(in thousands)	
Revenue:			
On demand	$ 953,576	$ 833,709	$ 642,622
Professional and other	34,560	35,771	28,341
Total revenue	988,136	869,480	670,963
Cost of revenue [(1)]	385,712	328,382	258,135
Amortization of product technologies	40,461	35,797	22,163
Gross profit	561,963	505,301	390,665
Operating expenses:			
Product development [(1)]	112,222	118,525	89,452
Sales and marketing [(1)]	193,962	166,607	140,473
General and administrative [(1)]	123,056	118,208	112,975
Amortization of intangible assets	40,303	35,911	17,755
Total operating expenses	469,543	439,251	360,655
Operating income	92,420	66,050	30,010
Interest expense and other, net	(31,862)	(31,750)	(14,769)
Income before income taxes	60,558	34,300	15,241
Income tax expense (benefit)	2,350	(425)	14,864
Net income	$ 58,208	$ 34,725	$ 377

[(1)] Includes stock-based expense as follows:

	Year Ended December 31,		
	2019	2018	2017
		(in thousands)	
Cost of revenue	$ 5,604	$ 4,403	$ 3,842
Product development	8,159	9,923	8,423
Sales and marketing	23,978	16,573	14,592
General and administrative	24,822	19,742	18,978

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,		
	2019	2018	2017
	(as a percentage of total revenue)		
Revenue:			
On demand	96.5%	95.9%	95.8%
Professional and other	3.5	4.1	4.2
Total revenue	100.0	100.0	100.0
Cost of revenue	39.0	37.8	38.5
Amortization of product technologies	4.1	4.1	3.3
Gross profit	56.9	58.1	58.2
Operating expenses:			
Product development	11.4	13.6	13.3
Sales and marketing	19.6	19.2	20.9
General and administrative	12.5	13.6	16.8
Amortization of intangible assets	4.1	4.1	2.6
Total operating expenses	47.5	50.5	53.7
Operating income	9.4	7.6	4.5
Interest expense and other, net	(3.2)	(3.7)	(2.2)
Income before income taxes	6.2	3.9	2.3
Income tax expense (benefit)	0.2	0.0	2.2
Net income	5.9%	4.0%	0.1%

Comparison of the years ended December 31, 2019 and 2018

Revenue

	Year Ended December 31,			
	2019	2018	Change	% Change
	(in thousands, except dollar per average on demand unit data)			
Revenue:				
On demand	$ 953,576	$ 833,709	$ 119,867	14.4%
Professional and other	34,560	35,771	(1,211)	(3.4)
Total revenue	$ 988,136	$ 869,480	$ 118,656	13.6
Non-GAAP on demand revenue	$ 954,444	$ 835,599	$ 118,845	14.2
Ending on demand units	18,475	16,219	2,256	13.9
Average on demand units	16,758	14,847	1,911	12.9
On demand annual client value	$ 1,039,588	$ 876,637	$ 162,951	18.6
On demand revenue per ending on demand unit	$ 56.27	$ 54.05	$ 2.22	4.1%

On demand revenue: During the year ended December 31, 2019, on demand revenue increased $119.9 million, or 14.4%, as compared to the same period in 2018. This increase was attributable to growth across our platform, primarily in resident services. This includes organic growth and acquired revenue from our 2018 and 2019 acquisitions. On demand revenue per ending on demand unit increased from $54.05 to $56.27 during the year ended December 31, 2019, primarily due to the organic growth of our solutions.

On demand revenue generated by our property management solutions grew $18.9 million, or 10.1%, during the twelve months ended December 31, 2019, as compared to the same period in 2018. This increase was primarily driven by the growth of our spend management solutions, adoption of our OneSite property management and Kigo Marketplace solutions, and growth of our accounting solutions.

On demand revenue from our resident services solutions continued to experience significant growth, increasing by $70.6 million, or 20.2%, year-over-year. Resident services increased primarily from continued strong growth of our payments solutions, as well as incremental revenue from our acquisitions of LeaseTerm Solutions and Simple Bills in 2019, and organic growth in our renter's insurance solutions.

On demand revenue from our leasing and marketing solutions increased $13.3 million, or 8.0%, during the year ended December 31, 2019, as compared to the same period in 2018. This increase was attributable to incremental revenue from our acquisition of LeaseLabs in the third quarter of 2018.

On demand revenue from our asset optimization solutions increased year-over-year by $17.1 million, or 13.1%. We continue to experience organic growth across our asset optimization platform, evidencing continued market acceptance of data-driven solutions. The increase was also attributable to incremental revenue from our acquisitions of Rentlytics in 2018 and Hipercept in 2019.

On demand unit metrics: As of December 31, 2019, one or more of our on demand solutions was utilized in the management of approximately 18.5 million rental property units. On demand units increased year-over-year by 2.3 million units, or 13.9%. This growth is primarily attributable to our 2019 acquisitions, which accounted for approximately 9.6% of total ending on demand units, and organic unit growth. On demand units managed by our clients renewed at an average rate of 96.5% over a trailing twelve-month period ended December 31, 2019.

Cost of Revenue

	Year Ended December 31,			
	2019	2018	Change	% Change
	(in thousands)			
Cost of revenue	$ 364,443	$ 311,907	$ 52,536	16.8%
Stock-based expense	5,604	4,403	1,201	27.3
Depreciation expense	15,665	12,072	3,593	29.8
Total cost of revenue	$ 385,712	$ 328,382	$ 57,330	17.5%

During the year ended December 31, 2019, cost of revenue, excluding stock-based expense and depreciation expense, increased $52.5 million, as compared to the same period in 2018. Direct costs increased $26.4 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 $24.2 million, primarily attributable to investments to support our ongoing organic growth and, to a lesser extent, new employees from our recent acquisitions. Additionally, in the fourth quarter of 2019, we recorded an impairment charge of $1.6 million related to intangible assets associated with certain international operations.

Amortization of Product Technologies

	Year Ended December 31,			
	2019	2018	Change	% Change
	(in thousands)			
Amortization of product technologies	$ 40,461	$ 35,797	$ 4,664	13.0%

During the year ended December 31, 2019, amortization of product technologies increased $4.7 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.

During the year ended December 31, 2019, our gross margin decreased year-over-year from 58.1% to 56.9%. This margin compression was driven primarily by revenue growth from lower margin products and investments to accelerate implementation of our solutions.

Operating Expenses

Product development

	Year Ended December 31,			
	2019	2018	Change	% Change
	(in thousands)			
Product development expense	$ 97,713	$ 102,935	$ (5,222)	(5.1)%
Stock-based expense	8,159	9,923	(1,764)	(17.8)
Depreciation expense	6,350	5,667	683	12.1
Total product development expense	$ 112,222	$ 118,525	$ (6,303)	(5.3)%

Product development expense, excluding stock-based expense and depreciation expense, decreased year-over-year by $5.2 million. This decrease was primarily driven by our internal initiative to centralize our product development efforts, increase productivity, and direct a greater portion of work effort towards major new development projects. Personnel expense, net of capitalized software development costs, decreased $4.3 million during the year ended December 31, 2019, due primarily to more efficient leveraging of our personnel in connection with this initiative.

Total product development expense as a percentage of total revenue was 11.4% in 2019, down from 13.6% in 2018, primarily due to organizational initiatives to centralize product development activities and focus our efforts towards major new development projects.

Sales and marketing

	Year Ended December 31,			
	2019	2018	Change	% Change
	(in thousands)			
Sales and marketing expense	$ 163,767	$ 145,081	$ 18,686	12.9%
Stock-based expense	23,978	16,573	7,405	44.7
Depreciation expense	6,217	4,953	1,264	25.5
Total sales and marketing expense	$ 193,962	$ 166,607	$ 27,355	16.4%

Sales and marketing expense for the year ended December 31, 2019, excluding stock-based expense and depreciation expense, increased $18.7 million, as compared to the same period in 2018. Personnel expense increased $14.8 million year-over-year, driven by our continued investments in our sales force and product marketing team, and incremental headcount from recent acquisitions. Marketing program and travel expenses increased year-over-year during the year ended December 31, 2019 by $5.6 million, reflecting investments to accelerate client demand across our portfolio of solutions, as well as additional costs for our annual RealWorld user conference during the third quarter of 2019. These increases are slightly offset by a decrease in impairment charges related to our intangible assets. In 2018, we recorded an impairment charge of $2.7 million related to the indefinite-lived trade name of our 2010 acquisition of Level One. In the fourth quarter of 2019, we recorded an impairment charge of $0.4 million related to intangible assets associated with certain international operations.

Total sales and marketing expense as a percentage of total revenue increased from 19.2% for the year ended December 31, 2018, to 19.6% for the year ended December 31, 2019. This increase was primarily driven by personnel-related investments in our sales force.

General and administrative

	Year Ended December 31,			
	2019	2018	Change	% Change
	(in thousands)			
General and administrative expense	$ 92,278	$ 92,680	$ (402)	(0.4)%
Stock-based expense	24,822	19,742	5,080	25.7
Depreciation expense	5,956	5,786	170	2.9
Total general and administrative expense	$ 123,056	$ 118,208	$ 4,848	4.1 %

General and administrative expense, excluding stock-based expense and depreciation expense, decreased year-over-year by $0.4 million. This net change resulted from a combination of factors. Losses on impairments and disposal of assets during the year ended December 31, 2019 decreased $6.4 million, primarily related to the fiscal year 2018 loss of $5.4 million in connection with a targeted email phishing campaign and the early retirement of assets and upgrades in our data center infrastructure. These decreases were partially offset by an increase of $2.3 million in personnel expense, primarily due to incremental headcount from our recent acquisitions. Fair value adjustments of acquisition-related liabilities increased $1.7 million primarily related to favorable adjustments in 2018. Legal and professional fees increased $1.5 million compared to prior year, principally related to 2019 acquisition-related expenses, partially offset by our 2018 settlement with the FTC.

General and administrative expense as a percentage of total revenue decreased from 13.6% to 12.5% during the year ended December 31, 2019, as compared to the same period in 2018, primarily due to the decrease in losses on impairments and disposal of assets in 2019 as compared to 2018, and our ability to leverage existing general and administrative resources to support our ongoing growth.

Amortization of intangible assets

	Year Ended December 31,			
	2019	2018	Change	% Change
	(in thousands)			
Amortization of intangible assets	$ 40,303	$ 35,911	$ 4,392	12.2%

During the year ended December 31, 2019, amortization expense of intangible assets increased $4.4 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.

Stock-based expense

	Year Ended December 31,			
	2019	2018	Change	% Change
	(in thousands)			
Stock-based expense	$ 62,563	$ 50,641	$ 11,922	23.5%

During the year ended December 31, 2019, stock-based expense increased $11.9 million compared to the prior year, primarily driven by incremental awards in connection with our 2019 and 2018 acquisitions. Stock-based expense as a percent of total revenue was 6.3% and 5.8% for the years ended December 31, 2019 and 2018, respectively.

Depreciation expense

	Year Ended December 31,			
	2019	2018	Change	% Change
	(in thousands)			
Depreciation expense	$ 34,188	$ 28,478	$ 5,710	20.1%

During the year ended December 31, 2019, depreciation expense increased $5.7 million compared to the prior year, primarily due to depreciation expense on our corporate headquarters that is classified as a finance lease subsequent to the adoption of the new lease standard.

Interest Expense and Other, Net

	Year Ended December 31,			
	2019	2018	Change	% Change
	(in thousands)			
Interest expense	$ (37,129)	$ (32,402)	$ (4,727)	14.6%
Interest income	2,073	2,443	(370)	(15.1)
Impairment loss on investment	—	(2,000)	2,000	(100.0)
Change in fair value of equity investment	2,600	—	2,600	100.0
Other income	594	209	385	184.2
Total interest expense and other, net	$ (31,862)	$ (31,750)	$ (112)	0.4%

Interest expense and other for the year ended December 31, 2019, increased $0.1 million as compared to the same period in 2018. Interest expense increased $4.7 million primarily due to $4.2 million of interest expense recognized on our finance lease liabilities following our adoption of ASC 842. This was offset by a $2.6 million increase in fair value of our investment in CompStak during 2019, and a decrease in impairment loss on investment of $2.0 million related to our investment in WayBlazer that was recognized in 2018.

Provision for Income Taxes

Our effective tax rate was 3.9% and (1.2)% for the years ended December 31, 2019 and 2018, respectively. For the year ended December 31, 2019, we recognized consolidated tax expense of $2.4 million on income before income taxes of $60.6 million. Our effective tax rate was lower than the statutory rate of 21% in 2019 and 2018 primarily as a result of research and development credits we recognized during the fourth quarter of 2019 and excess stock compensation deductions recognized in connection with the vesting of certain restricted stock grants and the exercise of certain stock options.

For further discussion, including a reconciliation of our effective tax rate from the statutory federal rate, see Note 13 to the Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K.

Quarterly Results of Operations

The following table presents our unaudited consolidated quarterly results of operations for the eight fiscal quarters ended December 31, 2019. 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.

	Three Months Ended,							
	December 31, 2019	**September 30, 2019**	**June 30, 2019**	**March 31, 2019**	**December 31, 2018**	**September 30, 2018**	**June 30, 2018**	**March 31, 2018**
	(in thousands, except per share amounts)							
Revenue:								
On demand	$ 246,235	$ 245,637	$ 235,185	$ 226,519	$ 218,051	$ 215,413	$ 206,945	$ 193,300
Professional and other	8,532	9,565	8,676	7,787	8,923	9,540	9,307	8,001
Total revenue	254,767	255,202	243,861	234,306	226,974	224,953	216,252	201,301
Cost of revenue	101,027	98,783	95,708	90,194	88,063	85,540	81,942	72,837
Amortization of product technologies	10,732	10,315	9,900	9,514	9,429	8,946	9,127	8,295
Gross profit	143,008	146,104	138,253	134,598	129,482	130,467	125,183	120,169
Operating expenses:								
Product development	26,308	27,866	28,151	29,897	29,772	28,942	30,771	29,040
Sales and marketing	48,113	51,906	49,120	44,823	45,084	43,179	40,664	37,680
General and administrative	35,354	31,249	28,310	28,143	32,638	30,036	28,444	27,090
Amortization of intangible assets	9,621	10,444	10,402	9,836	9,588	9,738	8,496	8,089
Total operating expenses	119,396	121,465	115,983	112,699	117,082	111,895	108,375	101,899
Operating income	23,612	24,639	22,270	21,899	12,400	18,572	16,808	18,270
Interest expense and other, net	(9,089)	(8,764)	(8,029)	(5,980)	(6,746)	(8,816)	(8,518)	(7,670)
Income before income taxes	14,523	15,875	14,241	15,919	5,654	9,756	8,290	10,600
Income tax (benefit) expense	(5,646)	4,171	(822)	4,647	(618)	683	(189)	(301)
Net income	$ 20,169	$ 11,704	$ 15,063	$ 11,272	$ 6,272	$ 9,073	$ 8,479	$ 10,901
Net income per share attributable to common stockholders:								
Basic	$ 0.22	$ 0.13	$ 0.16	$ 0.12	$ 0.07	$ 0.10	$ 0.10	$ 0.13
Diluted	$ 0.21	$ 0.12	$ 0.16	$ 0.12	$ 0.07	$ 0.09	$ 0.09	$ 0.13

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, 2019	September 30, 2019	June 30, 2019	March 31, 2019	December 31, 2018	September 30, 2018	June 30, 2018	March 31, 2018
	(as a percentage of total revenue)							
Revenue:								
On demand	96.7%	96.3%	96.4%	96.7%	96.1%	95.8%	95.7%	96.0%
Professional and other	3.3	3.7	3.6	3.3	3.9	4.2	4.3	4.0
Total revenue	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Cost of revenue	39.7	38.7	39.2	38.5	38.8	38.0	37.9	36.2
Amortization of product technologies	4.2	4.0	4.1	4.1	4.2	4.0	4.2	4.1
Gross profit	56.1	57.3	56.7	57.4	57.0	58.0	57.9	59.7
Operating expenses:								
Product development	10.3	10.9	11.5	12.8	13.1	12.9	14.2	14.4
Sales and marketing	18.9	20.3	20.1	19.1	19.9	19.2	18.8	18.7
General and administrative	13.9	12.2	11.6	12.0	14.4	13.4	13.2	13.5
Amortization of intangible assets	3.8	4.1	4.3	4.2	4.2	4.3	3.9	4.0
Total operating expenses	46.9	47.6	47.6	48.1	51.6	49.7	50.1	50.6
Operating income	9.3	9.7	9.1	9.3	5.5	8.3	7.8	9.1
Interest expense and other, net	(3.6)	(3.4)	(3.3)	(2.6)	(3.0)	(3.9)	(3.9)	(3.8)
Income before income taxes	5.7	6.2	5.8	6.8	2.5	4.3	3.8	5.3
Income tax (benefit) expense	(2.2)	1.6	(0.3)	2.0	(0.3)	0.3	(0.1)	(0.1)
Net income	7.9%	4.6%	6.2%	4.8%	2.8%	4.0%	3.9%	5.4%

Reconciliation of Quarterly Non-GAAP Financial Measures

The following table presents a reconciliation of net income to Adjusted EBITDA for the eight fiscal quarters ended December 31, 2019:

	Three Months Ended,							
	December 31, 2019	September 30, 2019	June 30, 2019	March 31, 2019	December 31, 2018	September 30, 2018	June 30, 2018	March 31, 2018
	(in thousands)							
Net income	$ 20,169	$ 11,704	$ 15,063	$ 11,272	$ 6,272	$ 9,073	$ 8,479	$ 10,901
Acquisition-related deferred revenue	449	38	157	224	1,056	418	103	313
Depreciation, asset impairment, and loss on disposal of assets	10,769	8,498	8,697	8,760	10,445	9,286	7,662	7,818
Amortization of product technologies and intangible assets	20,353	20,759	20,302	19,350	19,017	18,684	17,623	16,384
Change in fair value of equity investment	—	—	—	(2,600)	—	—	—	—
Loss due to cyber incident, net of recoveries	—	—	—	—	4,952	—	—	—
Acquisition-related expense (income)	3,594	755	376	29	(257)	519	1,168	1,007
Organizational realignment	849	684	—	—	—	—	—	—
Regulatory and legal matters	898	215	352	—	—	78	—	—
Stock-based expense	15,287	16,498	15,865	14,913	13,149	13,479	13,695	10,318
Interest expense, net	9,443	8,791	8,241	8,581	6,780	6,874	8,584	7,721
Income tax (benefit) expense	(5,646)	4,171	(822)	4,647	(618)	683	(189)	(301)
Adjusted EBITDA	$ 76,165	$ 72,113	$ 68,231	$ 65,176	$ 60,796	$ 59,094	$ 57,125	$ 54,161

Liquidity and Capital Resources

Our primary sources of liquidity as of December 31, 2019, consisted of $197.2 million of unrestricted cash and cash equivalents, $370.0 million available under our Revolving Facility, amounts available under the Amended Credit Facility's Accordion Feature, and $47.2 million of working capital (excluding $197.2 million of unrestricted cash and cash equivalents and $134.1 million of deferred revenue).

Our principal uses of liquidity have been to fund our working capital requirements, capital expenditures and acquisitions, to service our debt obligations, and to repurchase shares of our common stock. We expect that working capital requirements, capital expenditures, acquisitions, debt service, and share repurchases will continue to be our principal needs for liquidity over the near term. We made capital expenditures of $51.5 million, approximately 5% of total revenues, during the year ended December 31, 2019. We expect capital expenditures to remain at 5% of total revenue during the next few years. In addition, we have made several acquisitions in which a portion of the cash purchase price is payable at various times through 2023, with a majority of the deferred cash obligations payable during 2020 and 2021. We expect to fund these obligations totaling approximately $35.5 million from cash provided by operating activities or funds available under our Amended Credit Facility.

In May 2018, we filed a shelf registration statement on Form S-3 with the SEC, which became effective upon filing. The shelf registration allows us to periodically offer and sell, in one or more future offerings, an indeterminate amount of our common stock, preferred stock, debt securities, and other securities specified therein. 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. Net proceeds from this offering were used for repayment of indebtedness outstanding under our revolving facility and for general corporate purposes, including; acquisitions; sales and marketing activities; research and development activities; general and administrative matters; and capital expenditures.

We believe that our existing cash and cash equivalents, working capital (excluding deferred revenue and cash and cash equivalents), and our cash flows from operations are sufficient to fund our working capital requirements, and planned capital expenditures; and to service our debt obligations for at least the next twelve months. Our future working capital requirements will depend on many factors, including our rate of revenue growth, the timing and size of future acquisitions, the expansion of our sales and marketing activities, the timing and extent of spending to support product development efforts, the timing of introductions of new solutions and enhancements to existing solutions, and the continuing market acceptance of our solutions. We expect to enter into acquisitions of complementary businesses, applications, or technologies in the future that could require us to seek additional equity or debt financing. Additional funds may not be available on terms favorable to us, or at all.

As of December 31, 2019, our federal and state net operating loss ("NOL") carryforwards are $237.7 million and $97.7 million, respectively. Our federal and state NOL carryforwards may be available to offset potential payments of future income tax liabilities. If unused, the federal NOLs will begin to expire in 2026, and the state NOLs will begin to expire in 2020. Total state NOLs expiring in the next five years is approximately $1.1 million.

The following table sets forth cash flow data for the periods indicated therein:

	Year Ended December 31,		
	2019	2018	2017
		(in thousands)	
Net cash provided by operating activities	$ 316,973	$ 244,807	$ 140,263
Net cash used in investing activities	$ (719,094)	$ (331,296)	$ (699,862)
Net cash provided by financing activities	$ 460,011	$ 304,085	$ 536,349

Changes in Cash and Cash Equivalents during the year ended December 31, 2019:

Net Cash Provided by Operating Activities

During 2019, net cash provided by operating activities consisted of net income of $58.2 million, net non-cash adjustments to net income of $205.9 million, and a net inflow of cash from changes in assets and liabilities of $52.9 million. Non-cash adjustments to net income primarily consisted of depreciation and amortization expense of $115.0 million, stock-based expense of $62.6 million, amortization of debt discount and issuance costs of $13.7 million, and amortization of our right-of-use assets of $11.4 million.

Changes in working capital during 2019 included net cash inflows from customer deposits of $82.6 million, which was primarily attributable to the timing of cash settlements for previously initiated resident transactions related to our payments solutions. Net cash inflows also included changes in accounts payable of $9.3 million due to the timing of vendor invoice receipts and payments, and changes in deferred revenue of $7.7 million. These items were partially offset by net cash outflows for accounts receivable of $14.7 million, which is reflective of our revenue growth; outflows for prepaid expenses and other current assets of $13.8 million, primarily attributable to the $11.7 million of deferred compensation paid into escrow in connection with our acquisition of Buildium; and outflows for other current and long-term liabilities of $12.0 million, primarily attributable to rental payments for our operating leases.

Net Cash Used in Investing Activities

In 2019, we used $719.1 million for our investing activities, which primarily included $665.8 million, net of cash and restricted cash acquired, for our strategic acquisitions; $51.5 million for capital expenditures during the period; and $1.8 million for our additional investment in CompStak. Capital expenditures during the period primarily included capitalized software development costs and expenditures to support our information technology infrastructure.

Net Cash Provided by Financing Activities

The net cash provided by our financing activities during 2019 primarily consisted of aggregate borrowings under our Amended Credit Facility of $830.0 million. These borrowings were partially offset by payments on our term loans of $308.7 million; payments of acquisition-related consideration of $30.4 million; activity under our stock-based expense plans of $15.0 million, primarily attributable to shares repurchased from employees to cover their cost of taxes upon vesting of restricted stock; and treasury stock purchases of $8.5 million under our share repurchase program.

Changes in Cash and Cash Equivalents during the year ended December 31, 2018:

Net Cash Provided by Operating Activities

During 2018, net cash provided by operating activities consisted of net income of $34.7 million, net non-cash adjustments to net income of $168.1 million, and a net inflow of cash from changes in assets and liabilities of $42.0 million. Non-cash adjustments to net income primarily consisted of depreciation and amortization expense of $100.2 million, stock-based expense of $50.6 million, and amortization of debt discount and issuance costs of $12.5 million,

Changes in working capital during 2018 included net cash inflows from customer deposits of $57.2 million, which was primarily attributable to the timing of cash settlements for previously initiated resident transactions related to our payments solutions. This item was partially offset by net cash outflows for prepaid expenses and other current assets of $11.9 million, which was primarily due to the capitalization of sales commissions earned during 2018 and purchases of annual software licenses.

Net Cash Used in Investing Activities

In 2018, our investing activities resulted in a net cash outflow of $331.3 million. We used $278.6 million, net of cash and restricted cash acquired, to acquire ClickPay, BluTrend, LeaseLabs, and Rentlytics. We also used $50.9 million for capital expenditures during the period, which primarily included capitalized software development costs and expenditures to support our information technology infrastructure.

Net Cash Provided by Financing Activities

The net cash provided by our financing activities during 2018 primarily consisted of aggregate net proceeds from our common stock offering of $441.9 million, net of underwriting discounts and expenses directly attributable to the offering. This was partially offset by payments on our Revolving Facility of $50.0 million, net of proceeds, payments on our term loans of $14.1 million, payments of acquisition-related consideration of $28.4 million, treasury stock purchases of $28.1 million under our share repurchase program, and activity under our stock-based expense plans of $15.8 million, primarily attributable to shares repurchased from employees to cover their cost of taxes upon vesting of restricted stock.

Contractual Obligations, Commitments, and Contingencies

The following table summarizes our contractual cash obligations as of December 31, 2019, including interest when applicable, for long-term debt and other obligations for the next five years and thereafter:

	Payments Due by Period				
	Total	Less Than 1 year	1-3 years	3-5 years	More Than 5 years
			(in thousands)		
Convertible Notes [(1)]	$ 359,878	$ 5,175	$ 354,703	$ —	$ —
Term Loans [(2)]	677,273	35,680	94,920	546,673	—
Revolving Facility [(2)]	263,511	7,612	13,893	242,006	—
Operating and finance lease obligations	193,965	21,546	44,277	37,439	90,703
Acquisition-related liabilities [(3)]	35,450	26,325	8,700	425	—
	$ 1,530,077	$ 96,338	$ 516,493	$ 826,543	$ 90,703

(1) Represents the aggregate principal amount of $345.0 million and anticipated coupon interest payments related to our Convertible Notes and excludes the unamortized discount and debt issuance costs reflected in our Consolidated Balance Sheets.

(2) Represents the contractually required principal payments for our Term Loan and Delayed Draw Term Loan and $230.0 million of principal amount outstanding under the Revolving Facility. These amounts excludes unamortized debt issuance costs reflected in our Consolidated Balance Sheets. These amounts also include the anticipated interest obligations under our Amended Credit Facility, which were estimated using a LIBOR forward rate curve and include the related effects of our interest rate swap agreements.

(3) Represents obligations in connection with our acquisitions comprised of undiscounted amounts payable for our deferred cash obligations. These amounts exclude deferred stock obligations, contingent consideration of up to $25.3 million with a fair value of $6.5 million, and potential reductions related to the sellers' indemnification obligations.

Credit Facility

The Amended Credit Facility matures on September 5, 2024 (subject to early maturity provisions in certain circumstances, as described below), and includes the following:

Revolving Facility: The Amended Credit Facility provides $600.0 million in aggregate commitments for secured revolving loans, with sublimits of $10.0 million for the issuance of letters of credit and $20.0 million for swingline loans ("Revolving Facility"). During the fourth quarter of 2019, we borrowed $230.0 million of revolving loans, the proceeds of which were used to fund acquisition activity.

Initial Term Loan: An initial term loan of $300.0 million was borrowed on the closing date for the Amended Credit Facility (the "Term Loan"). The proceeds of the Term Loan were used to repay the term loan balances outstanding under the 2014 Credit Facility.

Delayed Draw Term Loan: In December 2019, we drew funds of $300.0 million available under the delayed draw term loan ("Delayed Draw Term Loan"), the proceeds of which were used to fund acquisition activity.

Revolving loans under the Amended Credit Facility may be voluntarily prepaid and re-borrowed. Principal payments on the Term Loan and Delayed Draw Term Loan (collectively, the "Term Loans") are due in quarterly installments equal to an initial amount of $3.8 million, which increases to $7.5 million beginning on December 31, 2020, increases to $11.3 million beginning on December 31, 2022, and increases to $15.0 million beginning on December 31, 2023. Once repaid or prepaid, the Term Loans may not be re-borrowed. All outstanding principal and accrued but unpaid interest is due, and the commitments for the Revolving Facility terminate, on the maturity date. The Term Loans are subject to mandatory repayment requirements in the event of certain asset sales or if certain insurance or condemnation events occur, subject to customary reinvestment provisions. We may prepay the Term Loans in whole or in part at any time without premium or penalty.

Accordion Feature: The Amended Credit Facility also allows us, subject to certain conditions, to request additional term loan commitments and/or additional revolving commitments in an aggregate principal amount of up to the greater of $250.0 million or 100% of consolidated EBITDA (as defined within the agreement) for the most recent four fiscal quarters, plus an amount that would not cause our consolidated senior secured net leverage ratio to exceed 3.50 to 1.00.

All outstanding revolving loans and term loans under the Amended Credit Facility mature on September 5, 2024. If on or prior to August 16, 2022, we have failed to demonstrate to the Agent (as defined in Note 9 to the Consolidated Financial Statements) that we would be in compliance with each financial covenant after giving pro forma effect to the repayment in full of the Convertible Notes which mature on November 15, 2022, then the Amended Credit Facility will mature on August 16,

2022. In addition, if on any business day during the period beginning on August 16, 2022 until the Convertible Notes are paid in full, our available liquidity is less than an amount equal to 125% of the outstanding principal amount of the Convertible Notes, then amounts outstanding under the Amended Credit Facility are due the next business day.

Refer to Note 9 of the accompanying Consolidated Financial Statements for further discussion of the Amended Credit Facility, including its terms and conditions.

Convertible Notes

In May 2017, we completed a private offering of Convertible Notes with an aggregate principal amount of $345.0 million. The net proceeds from this offering were $304.2 million, after adjusting for debt issue costs, including the underwriting discount and the net cash used to purchase the Note Hedges and sell the Warrants. The Convertible Notes accrue interest at an annual rate of 1.50%, which is payable semi-annually on May 15 and November 15 of each year. The Convertible Notes mature on November 15, 2022, and may not be redeemed by us prior to their maturity.

The holders may convert their notes to shares of our common stock, at their option, on or after May 15, 2022. Prior to May 15, 2022, holders may only convert their notes under certain circumstances specified in the Indenture. The Convertible Notes are convertible at an initial rate of 23.84 shares per $1,000 of principal (equivalent to an initial conversion price of approximately $41.95 per share of our common stock). Upon conversion, we will pay or deliver, as the case may be, cash, shares of our common stock, or a combination of cash and shares of our common stock, at our election. It is our stated intention to settle the principal balance of the Convertible Notes in cash and any conversion obligation in excess of the principal portion in shares of our common stock.

During the third quarter of 2019, we received conversion notices from certain holders with respect to an immaterial amount in aggregate principal of Convertible Notes requesting conversion as a result of the sales price condition having been met during the second quarter of 2019. In accordance with the terms of the Convertible Notes, we made cash payments of the aggregate principal amount and delivered newly issued shares of our common stock for the remainder of the conversion obligation in excess of the aggregate principal amount of the Convertible Notes being converted, in full satisfaction of such converted notes. We received shares of our common stock under the Note Hedges (as defined in Note 9 to the Consolidated Financial Statements), that offset the issuance of shares of common stock upon conversion of the Convertible Notes.

In conjunction with the Convertible Notes offering, we purchased Note Hedges and issued Warrants for approximately 8.2 million shares of our common stock. We paid $62.5 million to purchase the Note Hedges and received proceeds of $31.5 million from the issuance of the Warrants. The Note Hedges have an exercise price of $41.95 per share, consistent with the conversion price of the Convertible Notes, and expire in November 2022. The Note Hedges are generally expected to reduce the potential dilution to our common stock (or, in the event the conversion is settled in cash, to reduce our cash payment obligation) in the event that at the time of conversion our stock price exceeds the conversion price under the Convertible Notes. The Warrants have a strike price of $57.58 per share and expire in ratable portions on a series of expiration dates commencing on February 15, 2023.

Refer to Note 9 of the accompanying Consolidated Financial Statements for a complete discussion of these transactions and their accounting implications.

Stock Repurchase Program

In October 2018, our board of directors approved a share repurchase program authorizing the repurchase of up to $100.0 million of our outstanding common stock. The share repurchase program expired on October 25, 2019. In November 2019, 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 November 7, 2020.

Shares repurchased under the stock repurchase program are retired. Repurchase activity during the years ended December 31, 2019, 2018 and 2017 was as follows:

	Year Ended December 31,		
	2019	2018	2017
Number of shares repurchased	158,971	599,664	—
Weighted-average cost per share	$ 53.41	$ 46.83	$ —
Total cost of shares repurchased, in thousands	$ 8,491	$ 28,082	$ —

Off-Balance Sheet Arrangements

We do not have any off-balance sheet financing arrangements, and we do not have any relationships with unconsolidated entities or financial partnerships, such as entities often referred to as structured finance or special purpose entities, which have been established for the purpose of facilitating off-balance sheet arrangements or other contractually narrow or limited purposes.

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

Market risk represents the risk of loss that may impact our financial position due to adverse changes in financial market prices and rates. Our market risk exposure is primarily a result of fluctuations in interest rates and foreign currency exchange risks. We do not hold or issue financial instruments for trading purposes.

Interest Rate Risk

We had unrestricted cash and cash equivalents of $197.2 million and $228.2 million at December 31, 2019 and 2018, respectively. We hold cash and cash equivalents for working capital purposes. We do not have material exposure to market risk with respect to investments, as our investments consist primarily of highly liquid investments purchased with original maturities of three months or less.

We had $596.3 million and $305.0 million outstanding under our Term Loans at December 31, 2019 and 2018, respectively. At December 31, 2019, we had $230.0 million outstanding under our Revolving Facility, and no amounts outstanding as of December 31, 2018. At our option, amounts outstanding under the Amended Credit Facility accrue interest at a per annum rate equal to either LIBOR, plus a margin ranging from 1.00% to 2.00%, or the Base Rate, plus a margin ranging from 0.00% to 1.00% (“Applicable Margin”). The base LIBOR is, at our discretion, equal to either one, three, or six month LIBOR. The Base Rate is defined as the greater of Wells Fargo's prime rate, the Federal Funds Rate plus 0.50%, or one month LIBOR plus 1.00%. In each case, the Applicable Margin is determined based upon our consolidated net leverage ratio.

On March 31, 2016, we entered into two interest rate swap agreements to eliminate variability in interest payments on a portion of the Term Loans. For that portion, the swap agreements replaced the term note’s variable rate with a blended fixed rate of 0.89%. These agreements matured on September 30, 2019.

On December 24, 2018, we entered into two interest rate swap agreements to eliminate variability in interest payments on a portion of the Term Loans. For that portion, the swap agreements replace the term note’s variable rate with a blended fixed rate of 2.57%. We have designated these instruments as cash flow hedges of interest rate risk.

If the applicable variable interest rates had changed by 50 basis points, our interest expense for the year ended December 31, 2019, as reported in the accompanying Consolidated Statements of Operations, would have changed by approximately $0.8 million.

Foreign Currency Exchange Risk

We have foreign currency risks related to certain of our foreign subsidiaries, primarily in the Philippines and in India. The functional currency of these foreign subsidiaries is the U.S. dollar. The local currencies of these foreign subsidiaries are the Philippine peso and India rupee. Operating expenses in these foreign subsidiaries are primarily denominated in the respective local currency and are remeasured into our reporting currency at the average exchange rate in effect during the month. As of December 31, 2019, we had entered into foreign currency exchange forward contracts with an aggregate notional amount of $15.0 million to protect a portion of our forecasted U.S. dollar-equivalent operating expenses from adverse changes in foreign currency exchange rates. These hedging contracts reduce, but do not entirely eliminate, the impact of adverse foreign currency exchange rate movements. These contracts are designated as cash flow hedges for accounting purposes. For additional details, see Note 16 to the Consolidated Financial Statements.

We also enter into foreign currency forward contracts to hedge fluctuations associated with foreign currency denominated monetary assets and liabilities, primarily associated with our lease liabilities. These forward contracts are not designated for hedge accounting treatment. Accordingly, the change in fair value of these derivatives is recorded as a component of “General and administrative” expense in the accompanying Consolidated Statements of Operations and offsets the change in fair value of the foreign currency denominated assets and liabilities, which are also recorded in “General and administrative” expense. As of December 31, 2019, the notional amounts of outstanding foreign currency contracts entered into under our balance sheet hedge program was $2.8 million.

Adverse changes in exchange rates of 10% would have resulted in an adverse impact on income before income taxes of approximately $1.4 million at December 31, 2019. These reasonably possible adverse changes in exchange rates of 10% were applied to the total local currency monetary assets and liabilities not hedged by the foreign currency forward contracts discussed above, at the balance sheet dates, to compute the impact these changes would have had on our income before income taxes in the near term.

Item 8. Financial Statements and Supplementary Data.

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

Report of Independent Registered Public Accounting Firm

To the Shareholders and the Board of Directors of RealPage, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of RealPage, Inc. (the Company) as of December 31, 2019 and 2018, the related consolidated statements of operations, comprehensive income, stockholders' equity and cash flows for each of the three years in the period ended December 31, 2019, and the related notes and the financial statement schedule listed in the Index under Item 15(c) (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2019, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated March 2, 2020 expressed an adverse opinion thereon.

Basis for Opinion

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

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

Critical Audit Matters

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

Capitalized internal-use software development costs

Description of the Matter

As more fully described in Note 2 to the consolidated financial statements, the Company capitalizes certain internal-use software development costs incurred during development stage activities, if direct and incremental, until the software is substantially complete and ready for its intended use. The Company capitalizes certain costs related to internal-use software upgrades and enhancements when it is probable the expenditures will result in significant additional functionality. As of December 31, 2019, the Company had capitalized internal-use software development costs of $66.5 million, net of amortization.

Auditing the Company's capitalization of internal-use software development costs was especially challenging because management's determination of which costs qualify for capitalization requires significant judgment, as only those costs incurred during certain stages of software development that result in significant additional functionality can be capitalized in accordance with the applicable accounting standards.

How We Addressed the Matter in Our Audit	We obtained an understanding, evaluated the design and tested the operating effectiveness of controls over the Company's capitalized internal-use software development costs process. This included testing controls over management's determination of which projects and costs qualify for capitalization in accordance with the applicable accounting standards. Our audit procedures included, among others, inspecting underlying documentation to evaluate whether the costs were capitalizable under the applicable accounting standards. We also inquired of project managers for significant projects to assess the nature of the costs, the time devoted to capitalizable activities and the underlying documentation.

Accounting for Acquisitions

Description of the Matter	During 2019, the Company completed its acquisition of Buildium, LLC for aggregate consideration of $569.4 million, as disclosed in Note 3 to the consolidated financial statements. The transaction was accounted for as a business combination. Auditing the Company's accounting for its acquisition of Buildium, LLC was complex due to the significant estimation uncertainty in the Company's determination of the fair value of identified intangible assets, which principally consisted of developed technology of $57.0 million and customer relationship intangible assets of $55.0 million (collectively, "the intangible assets"). The significant estimation uncertainty was primarily due to the sensitivity of the respective fair values to underlying assumptions about the future performance of the acquired business. The Company used a discounted cash flow model to measure the intangible assets. The significant assumptions used to estimate the value of the intangible assets included discount rates, customer attrition rates, technology obsolescence rates, technology royalty rates and certain assumptions that form the basis of the forecasted results (i.e., revenue growth rates and EBITDA margin).
How We Addressed the Matter in Our Audit	We obtained an understanding, evaluated the design and tested the operating effectiveness of controls over the Company's accounting for its acquisitions. Our tests included controls over the estimation process supporting the fair value of the intangible assets and consideration transferred. We also tested management's review and evaluation of significant assumptions used in the discounted cash flow model. To test the estimated fair value of the intangible assets, we performed audit procedures, assisted by our valuation specialists, that included, among others, evaluating the Company's selection of the valuation methodology, evaluating the significant assumptions used by the Company's management, and evaluating the completeness and accuracy of the underlying data supporting the significant assumptions and estimates. For example, we compared the significant assumptions to current industry, market and economic trends, to the assumptions used to value similar assets in other acquisitions, to the historical results of the acquired business and to other guidelines used by companies within the same industry.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2004.

Dallas, Texas

March 2, 2020

Report of Independent Registered Public Accounting Firm

To the Shareholders and the Board of Directors of RealPage, Inc.

Opinion on Internal Control over Financial Reporting

We have audited RealPage, Inc.'s internal control over financial reporting as of December 31, 2019, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). In our opinion, because of the effect of the material weakness described below on the achievement of the objectives in the control criteria, RealPage, Inc. (the Company) has not maintained effective internal control over financial reporting as of December 31, 2019, based on the COSO criteria.

As indicated in the accompanying "Management's Report on Internal Control over Financial Reporting," management's assessment of and conclusion on the effectiveness of internal control over financial reporting did not include the internal controls of LeaseTerm Insurance Group, LLC (LeaseTerm Solutions), CRE Global Enterprises LLC, including certain of its subsidiaries (collectively known as Hipercept), Simple Bills Corporation (Simple Bills), Investor Management Services, LLC (IMS) and Buildium, LLC (Buildium), which are included in the 2019 consolidated financial statements of the Company.

LeaseTerm Solutions constituted approximately 1% and less than 1% of total assets and total revenues, respectively, as of December 31, 2019. Hipercept constituted approximately 1% and less than 1% of total assets and total revenues, respectively, as of December 31, 2019. Simple Bills constituted less than 1% and less than 1% of total assets and total revenues, respectively, as of December 31, 2019. IMS constituted approximately 2% and less than 1% of total assets and total revenues, respectively, as of December 31, 2019. Buildium constituted approximately 20% and less than 1% of total assets and total revenues, respectively, as of December 31, 2019. Our audit of internal control over financial reporting of the Company also did not include an evaluation of the internal control over financial reporting of LeaseTerm Solutions, Hipercept, Simple Bills, IMS, and Buildium.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the company's annual or interim financial statements will not be prevented or detected on a timely basis. The following material weakness has been identified and included in management's assessment. Management has identified a material weakness in controls over certain user access to IT systems and related changes to IT programs and data.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2019 and 2018, the related consolidated statements of operations, comprehensive income, stockholders' equity and cash flows for each of the three years in the period ended December 31, 2019, and the related notes and the financial statement schedule listed in the Index under Item 15(c) and our report dated March 2, 2020 expressed an unqualified opinion thereon.

Basis for Opinion

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

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

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

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

/s/ Ernst & Young LLP

Dallas, Texas

March 2, 2020

RealPage, Inc.

Consolidated Balance Sheets
(in thousands, except per share and share amounts)

	December 31,	
	2019	2018
Assets		
Current assets:		
Cash and cash equivalents	$ 197,154	$ 228,159
Restricted cash	243,323	154,599
Accounts receivable, less allowances of $10,271 and $8,850 at December 31, 2019 and 2018, respectively	143,127	123,596
Prepaid expenses	24,539	19,214
Other current assets	27,387	15,185
Total current assets	635,530	540,753
Property, equipment, and software, net	163,282	153,528
Right-of-use assets	121,941	—
Goodwill	1,611,749	1,053,119
Intangible assets, net	372,996	287,378
Deferred tax assets, net	33,812	42,602
Other assets	30,507	20,393
Total assets	$ 2,969,817	$ 2,097,773
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable	$ 40,092	$ 25,312
Accrued expenses and other current liabilities	89,038	95,482
Current portion of deferred revenue	134,148	120,704
Current portion of term loans	18,750	16,133
Customer deposits held in restricted accounts	243,316	154,601
Total current liabilities	525,344	412,232
Deferred revenue	4,793	4,902
Revolving facility	230,000	—
Term loans, net	575,313	287,582
Convertible notes, net	305,188	292,843
Lease liabilities, net of current portion	133,313	—
Other long-term liabilities	22,940	37,190
Total liabilities	1,796,891	1,034,749
Commitments and contingencies (Note 11)		
Stockholders' equity:		
Preferred stock, $0.001 par value: 10,000,000 shares authorized and zero shares issued and outstanding at December 31, 2019 and 2018, respectively	—	—
Common stock, $0.001 par value: 250,000,000 and 125,000,000 shares authorized, 96,100,296 and 95,991,162 shares issued and 94,744,157 and 93,650,127 shares outstanding at December 31, 2019 and 2018, respectively	96	96
Additional paid-in capital	1,222,356	1,187,683
Treasury stock, at cost: 1,356,139 and 2,341,035 shares at December 31, 2019 and 2018, respectively	(39,483)	(65,470)
Accumulated deficit	(7,695)	(58,793)
Accumulated other comprehensive loss	(2,348)	(492)
Total stockholders' equity	1,172,926	1,063,024
Total liabilities and stockholders' equity	$ 2,969,817	$ 2,097,773

See accompanying notes.

RealPage, Inc.

Consolidated Statements of Operations
(in thousands, except per share amounts)

	Year Ended December 31,		
	2019	2018	2017
Revenue:			
On demand	$ 953,576	$ 833,709	$ 642,622
Professional and other	34,560	35,771	28,341
Total revenue	988,136	869,480	670,963
Cost of revenue	385,712	328,382	258,135
Amortization of product technologies	40,461	35,797	22,163
Gross profit	561,963	505,301	390,665
Operating expenses:			
Product development	112,222	118,525	89,452
Sales and marketing	193,962	166,607	140,473
General and administrative	123,056	118,208	112,975
Amortization of intangible assets	40,303	35,911	17,755
Total operating expenses	469,543	439,251	360,655
Operating income	92,420	66,050	30,010
Interest expense and other, net	(31,862)	(31,750)	(14,769)
Income before income taxes	60,558	34,300	15,241
Income tax expense (benefit)	2,350	(425)	14,864
Net income	$ 58,208	$ 34,725	$ 377
Net income per share attributable to common stockholders:			
Basic	$ 0.63	$ 0.40	$ 0.00
Diluted	$ 0.60	$ 0.38	$ 0.00
Weighted average common shares outstanding:			
Basic	92,017	87,290	79,433
Diluted	96,282	91,531	82,398

See accompanying notes.

RealPage, Inc.

Consolidated Statements of Comprehensive Income
(in thousands)

	Year Ended December 31,		
	2019	2018	2017
Net income	$ 58,208	$ 34,725	$ 377
Other comprehensive (loss) income:			
Unrealized (loss) gain on derivative instruments, net of tax	(1,233)	61	318
Reclassification adjustment for gains included in earnings on derivative instruments, net of tax	(477)	(613)	(77)
Foreign currency translation adjustment	(171)	(183)	55
Other comprehensive (loss) income, net of tax	(1,881)	(735)	296
Comprehensive income	$ 56,327	$ 33,990	$ 673

See accompanying notes.

RealPage, Inc.

Consolidated Statements of Stockholders' Equity
(in thousands)

	Common Stock		Additional Paid-in	Accum. Other Comprehensive	Accumulated	Treasury Stock		Total Stockholders'
	Shares	Amount	Capital	(Loss) Income	Deficit	Shares	Amount	Equity
Balance as of January 1, 2017	86,062	$ 86	$ 534,348	$ (53)	$ (119,260)	4,975	$ (30,358)	$ 384,763
Cumulative effect of adoption of ASU 2016-09	—	—	6	—	43,837	—	—	43,843
Stock option exercises	991	1	27,013	—	—	(354)	—	27,014
Issuance of restricted stock	100	—	(2)	—	—	(1,795)	2	—
Treasury stock purchased, at cost	—	—	—	—	—	1,147	(30,904)	(30,904)
Stock-based compensation	—	—	46,146	—	—	—	—	46,146
Other comprehensive income - derivative instruments	—	—	—	241	—	—	—	241
Foreign currency translation	—	—	—	55	—	—	—	55
Equity component of convertible notes, net of issuance costs and deferred tax	—	—	61,390	—	—	—	—	61,390
Purchases of convertible note hedges	—	—	(62,549)	—	—	—	—	(62,549)
Issuance of warrants	—	—	31,499	—	—	—	—	31,499
Net income	—	—	—	—	377	—	—	377
Balance as of December 31, 2017	87,153	87	637,851	243	(75,046)	3,973	(61,260)	501,875
Cumulative effect of adoption of ASU 2014-09	—	—	—	—	2,221	—	—	2,221
Public offering of common stock, net of $16,949 of offering costs	8,050	8	441,893	—	—	—	—	441,901
Issuance of common stock in connection with our acquisitions	1,361	2	75,148	—	—	—	—	75,150
Stock option exercises	27	—	2,468	—	—	(632)	10,695	13,163
Issuance of restricted stock	—	—	(14,598)	—	—	(1,807)	14,598	—
Treasury stock purchased, at cost	—	—	473	—	—	1,407	(57,585)	(57,112)
Retirement of treasury stock	(600)	(1)	(7,388)	—	(20,693)	(600)	28,082	—
Stock-based compensation	—	—	51,836	—	—	—	—	51,836
Other comprehensive income - derivative instruments	—	—	—	(552)	—	—	—	(552)
Foreign currency translation	—	—	—	(183)	—	—	—	(183)
Net income	—	—	—	—	34,725	—	—	34,725
Balance as of December 31, 2018	95,991	96	1,187,683	(492)	(58,793)	2,341	(65,470)	1,063,024

Cumulative effect of adoption of ASU 2017-12	—	—	—	25	(25)	—	—	—
Issuance of common stock in connection with our acquisitions	234	—	14,846	—	—	—	—	14,846
Stock option exercises	39	—	(2,490)	—	—	(266)	8,323	5,833
Issuance of restricted stock	7	—	(41,904)	—	—	(1,371)	42,403	499
Treasury stock purchased, at cost	—	—	4,615	—	—	823	(33,973)	(29,358)
Retirement of treasury stock	(171)	—	(2,149)	—	(7,085)	(171)	9,234	—
Stock-based compensation	—	—	61,755	—	—	—	—	61,755
Other comprehensive income - derivative instruments	—	—	—	(1,710)	—	—	—	(1,710)
Foreign currency translation	—	—	—	(171)	—	—	—	(171)
Net income	—	—	—	—	58,208	—	—	58,208
Balance as of December 31, 2019	96,100	$ 96	$1,222,356	$ (2,348)	$ (7,695)	1,356	$ (39,483)	$ 1,172,926

See accompanying notes.

RealPage, Inc.

Consolidated Statements of Cash Flows
(in thousands)

	Year Ended December 31,		
	2019	2018	2017
Cash flows from operating activities:			
Net income	$ 58,208	$ 34,725	$ 377
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	114,952	100,186	67,146
Amortization of debt discount and issuance costs	13,700	12,464	7,296
Amortization of right-of-use assets	11,433	—	—
Deferred taxes	2,276	(2,179)	13,791
Stock-based expense	62,563	50,641	45,835
Loss on disposal and impairment of long-lived assets	2,536	6,733	524
Change in fair value of equity investment	(2,600)	—	—
Acquisition-related consideration	1,006	284	684
Changes in assets and liabilities, net of assets acquired and liabilities assumed in business combinations:			
Accounts receivable	(14,704)	(717)	(18,821)
Prepaid expenses and other current assets	(13,786)	(11,894)	945
Other assets	(5,107)	(4,543)	(717)
Accounts payable	9,318	1,266	268
Accrued compensation, taxes, and benefits	(1,150)	3,288	3,438
Deferred revenue	7,696	3,478	17,114
Customer deposits	82,631	57,230	3,055
Other current and long-term liabilities	(11,999)	(6,155)	(672)
Net cash provided by operating activities	316,973	244,807	140,263
Cash flows from investing activities:			
Purchases of property, equipment, and software	(51,500)	(50,933)	(49,752)
Acquisition of businesses, net of cash and restricted cash acquired	(665,844)	(278,563)	(649,910)
Purchase of other investments	(1,750)	(1,800)	(200)
Net cash used in investing activities	(719,094)	(331,296)	(699,862)
Cash flows from financing activities:			
Proceeds from term loans	600,000	—	199,400
Payments on term loans	(308,744)	(14,116)	(3,551)
Proceeds from revolving credit facility	230,000	140,000	50,000
Payments on revolving credit facility	—	(190,000)	—
Proceeds from borrowings on convertible notes	—	—	345,000
Purchase of convertible senior note hedges	—	—	(62,549)
Proceeds from issuance of warrants	—	—	31,499
Payments of deferred financing costs	(3,628)	(1,136)	(10,734)
Payments on finance lease obligations	(3,651)	(227)	(335)
Payments of acquisition-related consideration	(30,441)	(28,388)	(8,491)
Proceeds from public offering, net of underwriters' discount and offering costs	—	441,901	—
Proceeds from exercise of stock options	5,833	13,163	27,014
Purchase of treasury stock related to stock-based compensation	(20,867)	(29,030)	(30,904)
Purchase of treasury stock under share repurchase program	(8,491)	(28,082)	—
Net cash provided by financing activities	460,011	304,085	536,349
Net increase (decrease) in cash and cash equivalents	57,890	217,596	(23,250)
Effect of exchange rate on cash	(171)	(183)	55
Cash, cash equivalents and restricted cash:			
Beginning of period	382,758	165,345	188,540
End of period	$ 440,477	$ 382,758	$ 165,345

RealPage, Inc.

Consolidated Statements of Cash Flows, continued
(in thousands)

	Year Ended December 31,		
	2019	2018	2017
Supplemental cash flow information:			
Cash paid for interest	$ 16,073	$ 18,204	$ 6,754
Cash paid for income taxes, net of refunds	$ 2,074	$ 3,121	$ 1,855
Right-of-use assets obtained in exchange for operating lease obligations	$ 23,613	$ —	$ —
Non-cash investing and financing activities:			
Accrued property, equipment, and software	$ 2,608	$ 1,447	$ 5,777
Acquisition-related liabilities settled with equity	$ 14,846	$ —	$ —
Fair value of stock consideration in connection with acquisition of ClickPay	$ —	$ 53,334	$ —
Redemption of noncontrolling interest in connection with acquisition of ClickPay	$ —	$ 21,816	$ —

The following table provides a reconciliation of cash, cash equivalents and restricted cash reported within the Consolidated Balance Sheets to that shown in the Consolidated Statements of Cash Flows:

	Year Ended December 31,		
	2019	2018	2017
Cash and cash equivalents	$ 197,154	$ 228,159	$ 69,343
Restricted cash	243,323	154,599	96,002
Total cash, cash equivalents and restricted cash shown in the Consolidated Statements of Cash Flows	$ 440,477	$ 382,758	$ 165,345

See accompanying notes.

1. The Company

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, payment processing, 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.

2. Summary of Significant Accounting Policies

Basis of Presentation

The accompanying consolidated financial statements and footnotes have been prepared pursuant to the rules and regulations of the Securities and Exchange Commission ("SEC"). The consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America ("GAAP") and include the accounts of RealPage, Inc. and its wholly-owned subsidiaries. All intercompany accounts and transactions have been eliminated in consolidation.

Certain prior period amounts reported in our consolidated financial statements and notes thereto have been reclassified to conform to the current period's presentation.

Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make certain estimates and assumptions that affect the amounts reported and disclosed in the financial statements and accompanying notes. Such significant estimates include, but are not limited to, the determination of the allowances against our accounts receivable; useful lives of intangible assets; impairment assessments on long-lived assets (including goodwill and indefinite-lived intangibles); contingent commissions related to the sale of insurance products; fair value of acquired net assets and contingent consideration in connection with business combinations; the nature and timing of satisfaction of performance obligations and related reserves; fair values of stock-based awards; loss contingencies; and the recognition, measurement and valuation of current and deferred income taxes. Actual results could differ from these estimates. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable, the result of which forms the basis for making judgments about the carrying value of assets and liabilities.

Concentration of Credit Risk

Financial instruments that potentially subject us to concentrations of credit risk consist principally of cash and cash equivalents and accounts receivable. Our cash accounts are maintained at various high credit, quality financial institutions and may exceed federally insured limits. We have not experienced any losses in such accounts.

Substantially all of our accounts receivable are derived from clients in the residential rental housing market. Concentrations of credit risk with respect to accounts receivable and revenue are limited due to a large, diverse customer base. We do not require collateral from clients. We maintain an allowance for doubtful accounts based upon the expected collectability of accounts receivable.

No single client accounted for 10% or more of our revenue or accounts receivable for the years ended December 31, 2019, 2018, or 2017.

Segment and Geographic Information

Our chief operating decision maker is our Chief Executive Officer, who reviews financial information on a consolidated basis for purposes of allocating resources and evaluating financial performance. Accordingly, we have determined we operate as a single operating segment.

Principally, all of our revenue for the years ended December 31, 2019, 2018, and 2017 was earned in the United States. Net property, equipment, and software located in the United States amounted to \$154.5 million and \$144.3 million at December 31, 2019 and 2018, respectively. Net property, equipment, and software located in our international subsidiaries amounted to \$8.8 million and \$9.2 million at December 31, 2019 and 2018, respectively. Substantially all of the net property, equipment, and software held in our international subsidiaries was located in the Philippines, Spain, and India at December 31, 2019 and 2018.

Cash, Cash Equivalents and Restricted Cash

We consider all highly liquid investments with an initial maturity of three months or less at the date of purchase to be cash equivalents. The fair value of our cash and cash equivalents approximates carrying value.

Restricted cash consists of cash collected from tenants that will be remitted primarily to our clients.

Accounts Receivable

Accounts receivable primarily represent trade receivables from clients recorded at the invoiced amount, net of allowances, which are based on our historical experience, the aging of our trade receivables, and management judgment.

Trade receivable are written off against the allowance when management determines a balance is uncollectible. During the years ended December 31, 2019, 2018, and 2017, we incurred bad debt expense of $2.8 million, $3.7 million, and $3.2 million, respectively.

Property, Equipment, and Software

Property, equipment, and software are recorded at cost less accumulated depreciation and amortization, which are computed using the straight-line method over the following estimated useful lives:

Data processing and communications equipment	3 - 5 years
Furniture, fixtures, and other equipment	3 - 5 years
Software	3 - 5 years
Leasehold improvements	Shorter of lease term or estimated useful life

Software includes both purchased and internally developed software. Gains and losses from asset disposals are included in the line “General and administrative” in the Consolidated Statements of Operations.

Internally Developed Software

Costs incurred to develop software intended for our internal use are capitalized during the application development stage. Capitalization of such costs ceases once the project is substantially complete and ready for its intended use. We also capitalize costs related to specific upgrades and enhancements when it is probable the expenditure will result in additional functionality. Costs related to preliminary project activities and post-implementation operating activities are expensed as incurred.

Internally developed software costs are included in “Property, equipment, and software, net” in the accompanying Consolidated Balance Sheets and are amortized on a straight-line basis over their expected useful lives. Amortization of internally developed software is included in “Amortization of product technologies” in the accompanying Consolidated Statements of Operations.

Impairment of Long-Lived Assets

Tangible long-lived assets held and used are reviewed for impairment whenever events or changes in circumstances indicate that the carrying value may not be recoverable. Factors we consider important that could trigger an impairment review include, but are not limited to, significant under-performance relative to current and historical or projected future operating results, significant changes in the manner of our use of the asset, or significant changes in our overall business and/or product strategies. If circumstances require that a long-lived asset group be tested for impairment, determination of recoverability is based on an estimate of the undiscounted cash flows expected to be generated by that long-lived asset or asset group. If the carrying amount of the long-lived asset or asset group is not recoverable on an undiscounted cash flow basis, we would recognize an impairment charge equal to the excess of the carrying value over its fair value.

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. Purchase consideration includes assets transferred, liabilities assumed, and/or equity interests issued by us, all of which are measured at their fair value as of the date of acquisition. Our business combination transactions may be structured to include a combination of up-front, deferred and contingent payments to be made at specified dates subsequent to the date of acquisition. These payments may include a combination of cash and equity. Deferred and contingent payments determined to be purchase consideration are recorded at fair value as of the acquisition date. Deferred obligations are generally subject to adjustments specified in the underlying purchase agreement related to the seller's indemnification obligations. Contingent consideration is an obligation to make future payments to the seller contingent upon the achievement of future operational or financial targets.

The valuation of the net assets acquired as well as certain elements of purchase consideration require management to make significant estimates and assumptions, especially with respect to future expected cash flows, useful lives, and discount rates. Management's estimates of fair value are based upon assumptions believed to be reasonable, but which are inherently uncertain and, as a result, actual results may differ from estimates. During the measurement period, we may record adjustments to the assets acquired and liabilities assumed with a corresponding offset to goodwill. Changes to the fair value of contingent payments is reflected in "General and administrative" costs in the accompanying Consolidated Statements of Operations.

Acquisition costs are expensed as incurred and are included in "General and administrative" in the accompanying Consolidated Statements of Operations. We include the results of operations from acquired businesses in our consolidated financial statements from the effective date of the acquisition.

Goodwill and Indefinite-Lived Intangible Assets

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. Qualitative factors include industry and market considerations, overall financial performance, and other relevant events and circumstances affecting the reporting unit. 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. Our quantitative impairment assessment utilizes a weighted combination of a discounted cash flow model (known as the income approach) and comparisons to publicly traded companies engaged in similar businesses (known as the market approach). These approaches involve judgmental assumptions, including forecasted future cash flows expected to be generated by the business over an extended period of time, long-term growth rates, the identification of comparable companies, and our discount rate based on our weighted average cost of capital. These assumptions are predominately unobservable inputs and considered Level 3 measurements. 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. Key assumptions for this assessment include forecasted future cash flows from estimated royalty rates and our discount rate based on our weighted average cost of capital. These assumptions are unobservable Level 3 measurements, as described in Note 14 of our Consolidated Financial Statements. 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 would recognize an impairment loss equal to the excess of carrying value over fair value.

Intangible Assets

Intangible assets with determinable economic lives are carried at cost, less accumulated amortization. Our intangible assets are largely acquired in business combinations and include developed technologies, client relationships, vendor relationships, non-competition agreements and trade names. Intangible assets are amortized over the shorter of the contractual life or the estimated useful life. Intangible assets are amortized on a straight-line basis, except for client relationships which are amortized proportionately to the expected discounted cash flows derived from the asset.

Estimated useful lives for intangible assets consist of the following:

Developed technologies	3 - 7 years
Client relationships	3 - 10 years
Vendor relationships	7 years
Trade names	1 - 7 years
Non-competition agreements	5 - 10 years

Amortization of acquired developed technologies is included in "Amortization of product technologies", and amortization of acquired client relationships, vendor relationships, non-competition agreements and trade names is included in "Amortization of intangible assets" in the accompanying Consolidated Statements of Operations.

Other Current and Long-Term Liabilities

Accrued expenses and other current liabilities consisted of the following at December 31, 2019 and 2018:

	December 31,	
	2019	2018
	(in thousands)	
Accrued compensation, payroll taxes, and benefits	$ 28,444	$ 29,405
Sales tax obligations	4,232	3,673
Current portion of liabilities related to acquisitions	23,431	47,173
Lease-related liabilities[(1)]	16,127	2,640
Other current liabilities	16,804	12,591
Total accrued expenses and other current liabilities	$ 89,038	$ 95,482

Other long-term liabilities consisted of the following at December 31, 2019 and 2018:

	December 31,	
	2019	2018
	(in thousands)	
Deferred rent[(1)]	$ —	$ 25,207
Liabilities related to acquisitions	14,852	10,969
Deferred tax liabilities	2,353	—
Other long-term liabilities	5,735	1,014
Total other long-term liabilities	$ 22,940	$ 37,190

(1) We adopted ASU 2016-02, *Leases (Topic 842)* effective January 1, 2019. We used the optional transition method described in the *Recently Adopted Accounting Standards* section of Note 2, which eliminated the requirement to restate amounts presented prior to January 1, 2019. Refer to the accounting standards section below, and Note 7, for additional information.

Leases

We determine if an arrangement contains a lease at inception. Right-of-use ("ROU") assets represent the Company's right to use an underlying asset for the lease term and the corresponding lease liabilities represent its obligation to make lease payments arising from the lease. Our ROU assets and lease liabilities are recognized at the lease commencement date based on the present value of lease payments over the lease term. The ROU asset is reduced for tenant incentives and excludes any initial direct costs incurred. For our real estate contracts with lease and non-lease components, we have elected to combine the lease and non-lease components as a single lease component. The implicit rate within our leases are generally not readily determinable, and we use our incremental borrowing rate at the lease commencement date to determine the present value of lease payments. The determination of our incremental borrowing rate requires judgment. We determine our incremental borrowing rate for each lease using our current borrowing rate, adjusted for various factors including collateralization and term to align with the terms of the lease. Certain of our leases include options to extend the lease. Our lease values include options to extend the lease when it is reasonably certain we will exercise such options.

Operating and finance leases are included in "Right-of-use assets", "Accrued expenses and other current liabilities", and "Lease liabilities, net of current portion" in the accompanying Consolidated Balance Sheets.

Lease expenses for minimum lease payments for operating leases are recognized on a straight-line basis over the lease term. Amortization expense of the ROU asset for finance leases is recognized on a straight-line basis over the lease term and interest expense for finance leases is recognized based on the incremental borrowing rate.

We have elected not to recognize a lease liability or ROU asset for short-term leases, defined as those which have a term of twelve months or less.

Deferred Revenue

For several of our solutions, we invoice our clients in annual, monthly, or quarterly installments in advance of the commencement of the service period. Deferred revenue is recognized when billings are due or payments are received in advance of revenue recognition from our subscription and other services. Accordingly, the deferred revenue balance does not represent the total contract value of annual subscription agreements.

Revenue Recognition

Revenues are derived from on demand software solutions, 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. We estimate and accrue a reserve for credits and other adjustments as a reduction to revenue based on several factors, including past history.

On Demand Revenue

Our on demand revenue consists of license and subscription fees, transaction and payment processing 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 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 of solutions sold, client demographics and the number and types of users within our contracts.

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

Cost of Revenue

Cost of revenue consists primarily of salaries and related personnel expenses of our operations and support personnel, including training and implementation services; expenses related to the operation of our data centers; transaction processing fees; fees paid to third-party providers; allocations of facilities overhead costs; and depreciation.

Sales and Marketing Expenses and Deferred Commissions

Sales and marketing expenses consist primarily of personnel and related costs, including salaries, benefits, bonuses, commissions, travel, and stock-based compensation. Other costs included are marketing and promotional events, our annual user conference, and other online and product marketing costs. We amortize sales commissions that are directly attributable to a contract over an estimated customer benefit period of three years.

Advertising costs are expensed as incurred and totaled $29.4 million, $26.4 million, and $22.8 million for the years ended December 31, 2019, 2018, and 2017, respectively.

Stock-Based Expense

We recognize compensation expense related to stock options and restricted stock based on the estimated fair value of the awards on the date of grant. We generally grant time-based stock options and restricted stock awards, which vest over a specified period of time, and market-based awards, which become eligible to vest only after the achievement of a condition based upon the trading price of our common stock and vest over a specified period of time thereafter. The fair value of employee stock options is estimated on the date of grant using a binomial option pricing model, the Black-Scholes model. The fair value of time-based restricted stock awards is based on the closing price of our common stock on the date of grant. The fair value of market-based restricted stock awards is estimated using a discrete model based on multiple stock price-paths developed through the use of a Monte Carlo simulation.

For time-based stock options and restricted stock awards, expense is recognized on a straight-line basis over the requisite service period. Expense associated with market-based awards is recognized over the requisite service period using the graded-vesting attribution method. Share-based compensation is reduced for forfeitures once they occur.

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 changes are 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.

Fair Value Measurements

We measure our financial instruments and acquisition-related contingent consideration obligations at fair value at each reporting period using a fair value hierarchy. A financial instrument's classification within the fair value hierarchy is based upon the lowest level of input that is significant to the fair value measurement. Three levels of inputs may be used to measure fair value:

Level 1 - Inputs are quoted prices in active markets for identical assets or liabilities.

Level 2 - Inputs are quoted prices for similar assets or liabilities in active markets, quoted prices for identical or similar assets or liabilities in markets that are not active, inputs other than quoted prices that are observable, and market-corroborated inputs which are derived principally from or corroborated by observable market data.

Level 3 - Inputs are derived from valuation techniques in which one or more of the significant inputs or value drivers are unobservable.

The categorization of an asset or liability is based on the inputs described above and does not necessarily correspond to our perceived risk of that asset or liability. Moreover, the methods used by us may produce a fair value calculation that is not indicative of the net realizable value or reflective of future fair values. Furthermore, although we believe our valuation methods are appropriate and consistent with other market participants, the use of different methodologies or assumptions to determine the fair value of certain financial instruments and non-financial assets and liabilities could result in a different fair value measurement at the reporting date.

Certain financial instruments, which may include cash, cash equivalents, restricted cash, accounts receivable, accounts payable and accrued expenses are recorded at their carrying amounts, which approximates their fair values due to their short-term nature.

Recently Adopted Accounting Standards

Accounting Standards Update 2016-02

In February 2016, the FASB issued ASU 2016-02, *Leases (Topic 842).* The new guidance requires lessees to recognize assets and liabilities arising from all leases with a lease term of more than 12 months, including those classified as operating leases under previous accounting guidance. It also requires disclosure of key information about leasing arrangements to increase transparency and comparability among organizations.

We adopted ASU 2016-02 effective January 1, 2019 using the optional transition method provided for in ASU 2018-11, *Leases - Targeted Improvements,* which eliminated the requirement to restate amounts presented prior to January 1, 2019. We elected the practical expedients permitted under the transition guidance, which allowed us to adopt the guidance without reassessing whether arrangements contain leases, the lease classification and the determination of initial direct costs.

The adoption of ASC 842 resulted in the recognition of ROU assets and lease liabilities for operating leases of $73.9 million and $101.5 million, respectively, at January 1, 2019 (the "Transition Date") which included reclassifying deferred rent, lease incentives, and favorable and unfavorable leases associated with our acquisitions as a component of the ROU asset. As of the Transition Date, we had insignificant finance leases.

Certain of our leases include options to extend the lease. Our lease values include options to extend the lease when it is reasonably certain we will exercise such options. Subsequent to the Transition Date and during the first quarter of 2019, we determined we were reasonably certain to renew the building lease for our corporate headquarters, and as a result, we reassessed the classification of the lease and determined the building lease met the criteria of a finance lease under ASC 842. As a result, an operating ROU asset and lease liability of $36.4 million and $58.6 million, respectively, were reclassified and remeasured to a finance ROU asset and lease liability of $58.2 million and $80.4 million, respectively.

See Note 7 for additional disclosures related to the impact of adopting the new lease standard.

Accounting Standards Update 2017-12

In August 2017, the FASB issued ASU 2017-12, *Derivatives and Hedging (Topic 815): Targeted Improvements to Accounting for Hedging Activities*, which expands an entity's ability to apply hedge accounting for nonfinancial and financial risk components and allows for a simplified approach for fair value hedging of interest rate risk. Certain of the amendments in this ASU, as they relate to cash flow hedges, eliminate the requirement to separately record hedge ineffectiveness currently in earnings. Instead, the entire change in the fair value of the hedging instrument is recorded in Other Comprehensive Income ("OCI"), and amounts deferred in OCI will be reclassified to earnings in the same income statement line item in which the earnings effect of the hedged item is reported. Additionally, this ASU simplifies the hedge documentation and effectiveness assessment requirements under the previous guidance. This ASU must be applied on a modified retrospective basis through a cumulative effect adjustment to the opening balance of retained earnings as of the initial application date.

We adopted ASU 2017-12 effective January 1, 2019. As a result of our adoption, we now recognize the entire change in the fair value of our interest rate swaps in OCI. Similar to our treatment of the effective portion of a change in fair value, the ineffective portion is now reclassified into interest expense as interest payments are made on our variable rate debt. The effect of this adoption did not have a material impact to our financial statements.

Recently Issued Accounting Standards

In August 2018, the FASB issued ASU 2018-15, *Intangibles-Goodwill and Other-Internal-Use Software (Subtopic 350-40): Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That is a Service Contract.* This ASU aligns the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software. ASU 2018-15 is effective for fiscal years beginning after December 15, 2019, including interim periods within those fiscal years, and early adoption is permitted. We plan to adopt this guidance prospectively to eligible costs incurred on or after January 1, 2020, and we are currently evaluating potential changes to related processes and internal controls.

In June 2016, the FASB issued ASU 2016-13, *Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments*. The amendments in this ASU replace the incurred loss impairment methodology in current GAAP with a methodology that reflects expected credit losses and requires consideration of a broader range of reasonable and supportable information to inform credit loss estimates. ASU 2016-13 is effective for fiscal years beginning after December 15, 2019, including interim periods within those fiscal years. We will adopt ASU 2016-13 in the first quarter of 2020 utilizing the modified retrospective transition method through a cumulative-effect adjustment to retained earnings. The ASU is not expected to have a material impact on our consolidated financial statements.

3. Acquisitions

Fiscal Year 2019

Buildium

In November 2019, we entered into an Agreement and Plan of Merger and Stock Purchase Agreement (the "Merger Agreement"), by and among RealPage, Buildium, LLC ("Buildium"), and certain other parties named therein, to acquire all of the outstanding shares of capital stock of Buildium and the certain other parties named within the Merger Agreement. We closed the transaction on December 18, 2019. Buildium is a SaaS real estate property management solution provider that targets the smaller multifamily, single-family, associations (homeowner and condominium) and commercial real estate market segments. Aggregate purchase consideration was $569.4 million, including deferred cash obligations of up to $3.4 million that will be released on the one year anniversary following the closing date, subject to any indemnification claims. The purchase agreement provides for up to $11.7 million of deferred compensation for key employees for which post-acquisition employment service is required. The deferred compensation was paid into escrow at closing and recorded as a prepaid asset that will amortize into compensation expense ratably over the two-year term of the arrangement. The funds will be released 50% on each of the first and second year anniversary dates of the acquisition. In addition, the purchase agreement provides for up to $15.0 million of restricted stock awards, which may be settled in stock or cash at our choosing, to be issued or settled at a future date and for which post-acquisition employment service is required. The $15.0 million of restricted stock awards are comprised of 1) up to $7.5 million of restricted stock with service requirements that will be issued on the first anniversary date of the closing and vest ratably beginning the subsequent quarter over the following twelve quarters, and 2) up to $7.5 million of restricted stock awards contingent on the achievement of performance targets in 2022. The expected achievement of the performance awards as of December 31, 2019 is $3.8 million. As these awards are also tied to employment services, we will record this amount as stock-based compensation expense over the requisite service period. The acquisition was financed using cash on hand and funds available under our Amended Credit Facility, as defined in Note 9.

The acquired identified intangible assets consisted of developed technology, client relationships and trade names and were assigned estimated useful lives of five, ten and five years, respectively. Preliminary goodwill recognized of $468.8 million is primarily comprised of anticipated synergies from expected growth in market share in the SMB property management segment. Of this amount, approximately $193.9 million is expected to be deductible for tax purposes. Acquisition costs associated with this transaction totaled $2.4 million.

IMS

On December 11, 2019, we entered into an Agreement and Plan of Merger whereby we acquired 100% of the ownership interests of Investor Management Services, LLC ("IMS"). IMS provides an investor relationship management platform. Aggregate purchase consideration was $55.6 million, including deferred cash obligations of up to $5.7 million that will be released over an eighteen-month period following the closing date, subject to any indemnification claims. The acquisition was financed using cash on hand.

The acquired identified intangible assets consisted of developed technology, client relationships, trade names, and non-compete agreements and were assigned estimated useful lives of three, nine, three, and five years, respectively. Preliminary goodwill recognized of $39.4 million is primarily comprised of anticipated synergies from the expansion of our asset and investment managements solutions. Of this amount, approximately $34.8 million is expected to be deductible for tax purposes. Acquisition costs associated with this transaction totaled $1.0 million.

Simple Bills

On July 26, 2019, we acquired substantially all of the assets of Simple Bills Corporation ("Simple Bills"), a provider of utility management services for the multi-family student housing market. Aggregate purchase consideration was $18.1 million, including deferred cash obligations of up to $3.4 million that will be released over a two-year period following the closing date, subject to any indemnification claims. In addition, the purchase agreement provides for up to $10.0 million of restricted stock awards contingent upon the achievement of performance targets during 2020 and 2021 for which post-acquisition employment service is required. As these awards are tied to employment services, we will record this amount as stock-based compensation expense over the requisite service period. The acquisition was financed using cash on hand.

The acquired identified intangible assets consisted of developed technology, client relationships and trade names and were assigned estimated useful lives of seven, eight and five years, respectively. Preliminary goodwill recognized of $9.6 million is primarily comprised of anticipated synergies from the expansion of our utility billing solutions. Goodwill and the acquired identified intangible assets are deductible for tax purposes. Acquisition costs associated with this transaction totaled $0.1 million.

Hipercept

On July 10, 2019, we acquired substantially all of the assets of CRE Global Enterprises LLC ("CRE"), and certain of its subsidiaries, including 100% of the shares outstanding in its subsidiaries in the UK, Canada and Colombia (collectively "Hipercept"). Hipercept is a provider of data services and data analytics solutions to institutional commercial real estate owners. Aggregate purchase consideration was $28.3 million, including deferred cash obligations of up to $4.0 million, subject to any indemnification claims, to be released on the first and second anniversary dates of the closing date, and contingent consideration of up to $28.0 million based on the achievement of certain financial objectives during the six months ended June 30, 2022. The $28.0 million of contingent consideration is comprised of 1) cash payments of up to $25.3 million to CRE, and 2) stock grants of up to $2.7 million to certain individuals for which post-acquisition employment service is required. The fair value of the contingent consideration recorded as purchase consideration was $6.7 million on the date of acquisition and we will record an estimated $0.8 million tied to employment services as stock-based compensation expense over the service period. The acquisition was financed using cash on hand. The fair value of the contingent consideration was $6.5 million as of December 31, 2019. Refer to Note 14 for additional information regarding our contingent consideration liabilities.

The acquired identified intangible assets consisted of developed technology, client relationships and trade names and were assigned estimated useful lives of five, seven and three years, respectively. Preliminary goodwill recognized of $23.4 million is primarily comprised of anticipated synergies from the expansion of our asset and investment management solutions. Goodwill and the acquired identified intangible assets arising from the acquisition of Hipercept's domestic assets are deductible for tax purposes and those arising from the acquisition of the international entities are not. Acquisition costs associated with this transaction totaled $0.3 million.

LeaseTerm Solutions

On April 11, 2019, we acquired substantially all of the assets of LeaseTerm Insurance Group, LLC ("LeaseTerm Solutions"), a provider of alternatives to traditional renters' insurance programs and tenant security deposit programs for the multifamily housing industry. Aggregate purchase consideration was $26.5 million, including deferred cash obligations of up to $2.7 million that will be released on the first and second anniversary dates of the closing date, subject to any indemnification claims, and $0.5 million of working capital adjustments. The acquisition was financed using cash on hand.

The acquired identified intangible assets consisted of client relationships and trade names and were assigned estimated useful lives of seven and five years, respectively. Preliminary goodwill recognized of $18.6 million is primarily comprised of anticipated synergies from the expansion of our risk management solutions. Goodwill and the acquired identified intangible assets are deductible for tax purposes. Acquisition costs associated with this transaction totaled $0.3 million.

Purchase Consideration and Purchase Price Allocations

The estimated fair values of assets acquired and liabilities assumed are provisional and are based primarily on the information available as of the acquisition dates. We believe this information provides a reasonable basis for estimating the fair values of assets acquired and liabilities assumed, but we are awaiting additional information necessary to finalize those values. Therefore, the provisional measurements of fair value are subject to change, and such changes could be significant. We expect to finalize the valuation of these assets and liabilities as soon as practicable, but no later than one year from the acquisition closing dates. The components of the purchase consideration and the preliminary allocation of each purchase price, including the effects of measurement period adjustments recorded as of December 31, 2019, are as follows:

	LeaseTerm Solutions	Hipercept	Simple Bills	IMS	Buildium
			(in thousands)		
Fair value of purchase consideration:					
Cash, net of cash acquired	$ 23,417	$ 17,804	$ 14,875	$ 50,177	$ 566,241
Deferred obligations, net	3,095	3,799	3,274	5,428	3,190
Contingent consideration	—	6,700	—	—	—
Total fair value of purchase consideration	$ 26,512	$ 28,303	$ 18,149	$ 55,605	$ 569,431
Fair value of net assets acquired:					
Restricted cash	$ 5,889	$ —	$ —	$ —	$ 781
Accounts receivable	491	846	809	830	1,359
Property, equipment, and software	400	171	82	832	1,630
Intangible assets:					
Developed product technologies	—	1,700	4,000	7,300	57,000
Client relationships	7,100	3,000	5,200	7,500	55,000
Trade names	200	100	100	200	2,000
Non-compete agreements	—	—	—	1,100	—
Right-of-use assets	167	435	1,993	2,457	14,071
Goodwill	18,625	23,354	9,573	39,445	468,770
Other assets	—	18	115	596	3,710
Accounts payable and accrued liabilities	(342)	(751)	(1,497)	(1,180)	(8,389)
Client deposits held in restricted accounts	(5,889)	—	—	—	(781)
Deferred revenue	—	(253)	(547)	(1,124)	(3,715)
Other long-term liabilities	(129)	(317)	(1,679)	(2,120)	(11,893)
Deferred tax liability, net	—	—	—	(231)	(10,112)
Total fair value of net assets acquired	$ 26,512	$ 28,303	$ 18,149	$ 55,605	$ 569,431

Acquisitions Prior to 2019

We completed nine acquisitions during fiscal years 2018 and 2017. A summary of each acquisition can be found in the table below:

	Date of Acquisition	Aggregate Purchase Price	Closing Cash Payment, Net of Cash Acquired	Net Tangible Assets Acquired (Liabilities Assumed)	Identified Intangible Assets	Goodwill Recognized
				(in thousands)		
Axiometrics LLC	January 2017	$ 73,757	$ 66,050	$ (5,963)	$ 25,530	$ 54,190
American Utility Management	June 2017	$ 69,412	$ 64,775	$ 1,107	$ 22,398	$ 45,907
On-Site Manager, Inc.	September 2017	$ 251,109	$ 225,300	$ 3,197	$ 65,320	$ 182,592
PEX Software Limited	October 2017	$ 6,031	$ 5,103	$ (369)	$ 3,100	$ 3,300
Lease Rent Options	December 2017	$ 299,923	$ 298,040	$ 5,263	$ 91,666	$ 202,994
ClickPay Services, Inc.	April 2018	$ 220,992	$ 138,983	$ (4,620)	$ 52,700	$ 172,912
Blu Trend, LLC	July 2018	$ 8,500	$ 8,500	$ 343	$ 4,270	$ 3,887
LeaseLabs, Inc.	September 2018	$ 112,892	$ 84,498	$ 1,188	$ 27,200	$ 84,504
Rentlytics, Inc.	October 2018	$ 54,815	$ 47,895	$ 892	$ 12,200	$ 41,723

Purchase consideration for LeaseLabs, Inc. included contingent consideration of up to $9.9 million based on the collection of acquisition date accounts receivable balances during the six-month period after the acquisition date. The fair value of the contingent consideration was $7.0 million on the date of acquisition. The final contingent consideration amount of $6.0

million was paid in April 2019. Refer to Note 14 for additional information regarding our contingent consideration obligation.

Purchase consideration for Axiometrics included contingent consideration of up to $5.0 million payable if certain revenue targets were achieved during the twelve-month period ending December 31, 2018. Based on information that was available at December 31, 2018, management has determined the fair value of the contingent consideration to be zero.

Deferred Obligations and Contingent Consideration Activity

The following table presents changes in our deferred cash and stock obligations and contingent consideration for the fiscal years ended December 31, 2019 and 2018:

	Deferred Cash and Stock Obligations	Contingent Consideration	Total
		(in thousands)	
Balance at January 1, 2018	$ 47,016	$ 414	$ 47,430
Additions, net of fair value discount	36,313	7,000	43,313
Cash payments	(29,600)	(247)	(29,847)
Accretion expense	1,970	—	1,970
Change in fair value	—	(1,167)	(1,167)
Indemnification claims and other adjustments	(3,557)	—	(3,557)
Balance at December 31, 2018	52,142	6,000	58,142
Additions, net of fair value discount	18,183	6,700	24,883
Cash payments	(25,215)	(5,963)	(31,178)
Settlements through common stock issued	(14,846)	—	(14,846)
Accretion expense	1,540	58	1,598
Change in fair value	—	(259)	(259)
Indemnification claims and other adjustments	(57)	—	(57)
Balance at December 31, 2019	$ 31,747	$ 6,536	$ 38,283

In May 2019, in connection with our April 2018 acquisitions of NovelPay, LLC ("NovelPay") and ClickPay Services, Inc. (collectively with NovelPay, "ClickPay"), we issued an aggregate of 154,281 shares of our common stock to the equity holders of ClickPay. These shares are subject to a holdback in respect of indemnification and post-closing purchase price adjustments pursuant to the acquisition agreements.

In September 2019, we settled a deferred equity obligation with regard to our September 2018 acquisition of LeaseLabs, Inc. through the issuance of 80,012 shares of our common stock.

Pro Forma Results of Acquisitions

The following table presents unaudited pro forma results of operations for the years ended December 31, 2019 and 2018, as if the aforementioned 2019 and 2018 acquisitions had occurred as of January 1, 2018 and January 1, 2017, respectively. The pro forma information includes the business combination accounting effects resulting from these acquisitions, including interest expense, tax expense or benefit, issuance of our common shares, and additional amortization resulting from the valuation of amortizable intangible assets. We prepared the pro forma financial information for the combined entities for comparative purposes only, and it is not indicative of what actual results would have been if the acquisitions had occurred at the beginning of the periods presented, or of future results.

	Year Ended December 31,	
	2019 Pro Forma	2018 Pro Forma
	(unaudited) (in thousands, except per share amounts)	
Total revenue	$ 1,059,141	$ 960,009
Net income (loss)	$ 20,000	$ (15,297)
Net income (loss) per share:		
Basic	$ 0.22	$ (0.17)
Diluted	$ 0.21	$ (0.17)

4. Revenue Recognition

On January 1, 2018, we adopted the new revenue standard using the modified retrospective method for those contracts with remaining service obligations as of January 1, 2018. Results for reporting periods beginning after January 1, 2018 are presented under the new revenue standard, while prior period amounts are not adjusted and continue to be reported under the accounting standards in effect for the prior period.

Disaggregation of Revenue

The following table presents our revenues disaggregated by major revenue source. Sales and usage-based taxes are excluded from revenues.

	Year Ended December 31,		
	2019	2018	2017
		(in thousands)	
On demand			
Property management	$ 205,903	$ 186,975	$ 167,002
Resident services	421,075	350,457	272,176
Leasing and marketing	179,622	166,361	123,804
Asset optimization	146,976	129,916	79,640
Total on demand revenue	953,576	833,709	642,622
Professional and other	34,560	35,771	28,341
Total revenue	$ 988,136	$ 869,480	$ 670,963

On Demand Revenue

We generate the majority of our on demand revenue by licensing software-as-a-service ("SaaS") solutions to our clients on a subscription basis. Our SaaS solutions are provided pursuant to contractual commitments that typically include a promise that we will stand ready, on a monthly basis, to deliver access to our technology platform over defined service delivery periods. These solutions represent a series of distinct services that are substantially the same and have the same pattern of transfer to the client. Revenue from our SaaS solutions is generally recognized ratably over the term of the arrangement.

Consideration for our on demand subscription services consist of fixed, variable and usage-based fees. We invoice a portion of our fees at the initial order date and then monthly or annually thereafter. Subscription fees are generally fixed based on the number of sites and the level of services selected by the client.

We sell certain usage-based services, primarily within our property management, resident services and leasing and marketing solutions, to clients based on a fixed rate per transaction. Revenues are calculated based on the number of transactions processed monthly and will vary from month to month based on actual usage of these transaction-based services over the contract term, which is typically one year in duration. The fees for usage-based services are not associated with every distinct service promised in the series of distinct services we provide our clients. As a result, we allocate variable usage-based fees only to the related transactions and recognize them in the month that usage occurs.

As part of our resident services offerings, 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 insurance company underwriting partners charge to the policyholder and are subject to forfeiture in instances where a policyholder cancels prior to the end of the policy. The overall insurance services we provide represent a single performance obligation that qualifies as a separate series in accordance with the new revenue standard. Our contracts with our underwriting partners also provide for contingent commissions to be paid to us in accordance with the agreements. The contingent commissions are not associated with every distinct service promised in the series of distinct insurance services we provide. We generally accrue and recognize contingent commissions monthly based on estimates of the variable factors identified in the terms of the applicable agreements.

Professional Services and Other Revenues

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 revenues primarily consist of fees for implementation services, consulting services and training. Professional services are billed either on a fixed rate per hour (time) and materials basis or on a fixed price basis. Professional services are typically sold bundled in a contract with other on demand solutions but may be sold separately. For bundled arrangements, we allocate the transaction price to separate services based on their relative standalone selling prices if a service is separately identifiable from other items in the bundled arrangement and if a client can benefit from it on its own or with other resources readily available to the client.

Other revenues consist of submeter equipment sales that include related installation services, sales of other equipment and on premise software sales. Submeter hardware and installation services are considered to be part of a single performance obligation due to the significance of the integration and interdependency of the installation services with the meter equipment. Our typical payment terms for submeter installations require a percentage of the overall transaction price to be paid upfront, with the remainder billed as progress payments. We recognize submeter revenue in proportion to the number of fully 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, which occurs at a point in time, typically upon delivery to the client.

The majority of on premise revenue consists of maintenance renewals from clients who renew for an additional one-year term. Maintenance renewal revenue is recognized ratably over the service period based upon the standalone selling price of that service obligation.

Contract Balances

Contract assets generally consist of amounts recognized as revenue before they can be invoiced to clients or amounts invoiced to clients prior to the period in which the service is provided where the right to payment is subject to conditions other than just the passage of time. These contract assets are included in “Accounts receivable” in the accompanying Consolidated Financial Statements and related disclosures. Contract liabilities are comprised of billings or payments received from our clients in advance of performance under the contract. We refer to these contract liabilities as “Deferred revenue” in the accompanying Consolidated Financial Statements and related disclosures. We recognized $117.2 million of on demand revenue during the year ended December 31, 2019, which was included in the line “Deferred revenue” in the accompanying Consolidated Balance Sheets as of the beginning of the period.

Contract Acquisition Costs

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. Below is a summary of our capitalized commissions costs and their respective locations in the accompanying Consolidated Balance Sheets:

	Balance Sheet Location	December 31, 2019	December 31, 2018
		(in thousands)	
Capitalized commissions costs - current	Other current assets	$ 9,870	$ 6,679
Capitalized commissions costs - noncurrent	Other assets	8,463	7,757
Total capitalized commissions costs		$ 18,333	$ 14,436

Amortization of the capitalized commissions was $8.7 million and $5.4 million for the years ended December 31, 2019 and 2018, respectively. No impairment loss was recognized in relation to these capitalized costs.

Remaining Performance Obligations

Certain clients commit to purchase our solutions for terms ranging from two to seven years. We expect to recognize approximately $502.2 million of revenue in the future related to performance obligations for on demand contracts with an original duration greater than one year that were unsatisfied or partially unsatisfied as of December 31, 2019. Our estimate does not include amounts related to:

- professional and usage-based services that are billed and recognized based on services performed in a certain period;
- amounts attributable to unexercised contract renewals that represent a material right; or
- amounts attributable to unexercised client options to purchase services that do not represent a material right.

We expect to recognize revenue on approximately 71.4% of the remaining performance obligations over the next 24 months, with the remainder recognized thereafter. Revenue from remaining performance obligations for professional service contracts as of December 31, 2019 was immaterial.

5. Accounts Receivable

Accounts receivable consisted of the following at December 31, 2019 and 2018:

	December 31,	
	2019	2018
	(in thousands)	
Trade receivables from clients	$ 137,039	$ 120,767
Insurance commissions receivable	16,359	11,679
Accounts receivable, gross	153,398	132,446
Less: Allowances	(10,271)	(8,850)
Accounts receivable, net	$ 143,127	$ 123,596

Trade receivables include amounts billed to our clients, primarily under our on demand subscription solutions. Trade receivables also includes amounts invoiced to clients prior to the period in which the service is provided and amounts for which we have met the requirements to recognize revenue in advance of invoicing the client. Insurance commissions receivable consists of commissions derived from the sale of insurance products to individuals and contingent commissions related to those policies. Contingent commissions are determined based on a calculation that considers earned agent commissions, a percent of premium retained by our underwriting partner, incurred losses, and profit retained by our underwriting partner during the time period. Contingent commissions receivables are recorded at their estimated net realizable value, based on estimates and considerations which include, but are not limited to, the historical and projected loss rates incurred by the underlying policies.

6. Property, Equipment, and Software

Property, equipment, and software consisted of the following at December 31, 2019 and 2018:

	December 31,	
	2019	2018
	(in thousands)	
Leasehold improvements	$ 70,558	$ 63,391
Data processing and communications equipment	77,358	68,015
Furniture, fixtures, and other equipment	35,856	33,840
Software	157,832	131,437
Property, equipment, and software, gross	341,604	296,683
Less: Accumulated depreciation and amortization	(178,322)	(143,155)
Property, equipment, and software, net	$ 163,282	$ 153,528

Depreciation and amortization expense for property, equipment, and purchased software was $30.2 million, $28.5 million, and $27.2 million for the years ended December 31, 2019, 2018, and 2017, respectively.

The unamortized amount of capitalized software development costs was $66.5 million and $54.9 million at December 31, 2019 and 2018, respectively. Amortization expense related to capitalized software development costs totaled $14.8 million, $11.9 million, and $8.0 million during the years ended December 31, 2019, 2018, and 2017, respectively.

7. Leases

We adopted ASU 2016-02 effective January 1, 2019 using the modified retrospective approach. Prior period amounts have not been adjusted and continue to be reported in accordance with our historic accounting under *Topic 840*. Our leases are primarily comprised of real estate leases of office facilities and equipment under operating leases that expire on various dates through 2033. In May 2015, we entered into a lease agreement for office space located in Richardson, Texas to serve as our corporate headquarters and data center. The lease is for a term of twelve years, beginning in 2016, and includes optional extension periods. The lease agreement contains provisions for rent escalations over the term of the lease and leasehold improvement incentives, and is currently classified as a finance lease.

The components of lease costs for the year ended December 31, 2019 were as follows:

	December 31, 2019
	(in thousands)
Operating lease cost	$ 13,949
Finance lease cost:	
Depreciation of finance lease asset	$ 3,969
Interest on lease liabilities	4,221
Total finance lease cost	$ 8,190

Rent expense for short-term leases for the year ended December 31, 2019 was not material. Rent expense for operating leases for the year ended December 31, 2018 and 2017 was $15.8 million and $13.8 million, respectively.

Supplemental balance sheet information related to leases at December 31, 2019, was as follows:

	Operating leases	Finance leases	Total leases
	(in thousands, except lease term and discount rate)		
Right-of-use assets	$ 67,700	$ 54,241	$ 121,941
Lease liabilities, current [1]	$ 12,873	$ 3,254	$ 16,127
Lease liabilities, net of current portion	59,822	73,491	133,313
Total lease liabilities	$ 72,695	$ 76,745	$ 149,440
Weighted average remaining term (in years)	6.1	13.7	
Weighted average discount rate	4.8%	5.4%	

(1) Included in the line "Accrued expenses and other current liabilities" in the accompanying Consolidated Balance Sheets.

Supplemental cash flow information related to leases for the twelve months ended December 31, 2019, was as follows, in thousands:

Cash payments for lease liabilities within operating activities:	
Operating leases	$ 14,890
Finance leases	$ 4,221

At December 31, 2019, future maturities of lease liabilities due under these lease agreements were as follows for the years ending December 31, in thousands:

	Operating leases	Finance leases	Total leases
2020	$ 14,727	$ 6,819	$ 21,546
2021	15,585	7,504	23,089
2022	13,579	7,609	21,188
2023	11,951	7,714	19,665
2024	9,955	7,819	17,774
Thereafter	18,488	72,215	90,703
Total undiscounted lease payments	84,285	109,680	193,965
Present value adjustment	(11,590)	(32,935)	(44,525)
Present value of lease payments	$ 72,695	$ 76,745	$ 149,440

8. Goodwill and Identified Intangible Assets

Changes in the carrying amount of goodwill during the years ended December 31, 2019 and 2018, were as follows, in thousands:

Balance at January 1, 2018	$ 751,052
Goodwill acquired	304,162
Measurement period and other adjustments	(2,095)
Balance at December 31, 2018	1,053,119
Goodwill acquired	558,977
Measurement period and other adjustments	(347)
Balance at December 31, 2019	$ 1,611,749

We completed our annual goodwill impairment test during the fourth quarter of the fiscal year ended December 31, 2019. Based on the results of the qualitative analysis, we concluded that there was no impairment of goodwill. No impairment of goodwill was recognized during 2018 or 2017.

Intangible assets consisted of the following at December 31, 2019 and 2018:

	December 31, 2019			December 31, 2018		
	Carrying Amount	Accumulated Amortization	Net	Carrying Amount	Accumulated Amortization	Net
	(in thousands)					
Finite-lived intangible assets:						
Developed technologies	$ 277,030	$ (125,537)	$ 151,493	$ 207,310	$ (100,445)	$ 106,865
Client relationships	341,438	(140,044)	201,394	264,228	(107,155)	157,073
Vendor relationships	—	—	—	5,650	(5,650)	—
Trade names	25,557	(16,928)	8,629	22,956	(10,682)	12,274
Non-compete agreements	5,273	(2,186)	3,087	4,173	(1,395)	2,778
Total finite-lived intangible assets	649,298	(284,695)	364,603	504,317	(225,327)	278,990
Indefinite-lived intangible assets:						
Trade names	8,393	—	8,393	8,388	—	8,388
Total intangible assets	$ 657,691	$ (284,695)	$ 372,996	$ 512,705	$ (225,327)	$ 287,378

Amortization expense for finite-lived intangible assets totaled $66.0 million, $59.8 million, and $31.9 million during the years ended December 31, 2019, 2018, and 2017, respectively.

The following table sets forth the estimated amortization of intangible assets for the years ending December 31, in thousands:

2020	$ 79,124
2021	71,091
2022	60,529
2023	52,702
2024	47,745

In the fourth quarter of 2019, we recorded an impairment charge of $2.0 million related to certain developed technology and customer relationship intangible assets associated with our international operations based on the excess of the carrying value over its estimated fair value. Fair value was estimated using a standard valuation methodology (the income approach) incorporating management's assumptions on revenue growth rates and discount rates. There was no remaining carrying value for these intangible assets subsequent to the impairment charge. The method utilized to estimate the fair value incorporated significant unobservable inputs, and we concluded that the measurement should be classified within Level 3 of the fair value hierarchy.

In 2018, we recorded an impairment of $2.7 million related to the indefinite-lived trade name of our 2010 acquisition of Level One, based on the excess of the carrying value over its estimated fair value.

Impairment charges for the period ended December 31, 2019 are included in “Cost of revenue” and “Sales and marketing” in the accompanying Consolidated Statements of Operations. Prior period impairment charges are included in “Sales and marketing” in the accompanying Consolidated Statements of Operations.

9. Debt

On September 5, 2019, we entered into a $1.2 billion Amended and Restated Credit Agreement (the “Amended Credit Facility”) to amend and restate our previous credit facility, originally dated as of September 30, 2014 (as previously amended, the “2014 Credit Facility”). The Amended Credit Facility was entered into by and among the Company, the lenders from time to time party thereto (the “Lenders”), and Wells Fargo Bank, National Association, as administrative agent (the “Agent”).

The Amended Credit Facility extends the maturity date of the 2014 Credit Facility from February 27, 2022 to September 5, 2024 (subject to early maturity provisions in certain circumstances, as described below), reduces our borrowing costs, provides additional borrowing capacity, and increases covenant flexibility. The Amended Credit Facility provides for the following:

Revolving Facility: The Amended Credit Facility provides $600.0 million in aggregate commitments for secured revolving loans, with sublimits of $10.0 million for the issuance of letters of credit and $20.0 million for swingline loans (“Revolving Facility”). During the fourth quarter of 2019, we borrowed $230.0 million of revolving loans, the proceeds of which were used to fund acquisition activity.

Initial Term Loan: An initial term loan of $300.0 million was borrowed on the closing date for the Amended Credit Facility (the “Term Loan”). The proceeds of the Term Loan were used to repay the term loan balances outstanding under the 2014 Credit Facility.

Delayed Draw Term Loan: In December 2019, we drew funds of $300.0 million available under the delayed draw term loan (“Delayed Draw Term Loan”).

Revolving loans under the Amended Credit Facility may be voluntarily prepaid and re-borrowed. Principal payments on the Term Loan and Delayed Draw Term Loan (collectively, the “Term Loans”) are due in quarterly installments equal to an initial amount of $3.8 million, which increases to $7.5 million beginning on December 31, 2020, increases to $11.3 million beginning on December 31, 2022, and increases to $15.0 million beginning on December 31, 2023. Once repaid or prepaid, the Term Loans may not be re-borrowed. All outstanding principal and accrued but unpaid interest is due, and the commitments for the Revolving Facility terminate, on the maturity date. The Term Loans are subject to mandatory repayment requirements in the event of certain asset sales or if certain insurance or condemnation events occur, subject to customary reinvestment provisions. We may prepay the Term Loans in whole or in part at any time without premium or penalty.

Accordion Feature: The Amended Credit Facility also allows us, subject to certain conditions, to request additional term loan commitments and/or additional revolving commitments in an aggregate principal amount of up to the greater of $250.0 million or 100% of consolidated EBITDA (as defined within the agreement) for the most recent four fiscal quarters, plus an amount that would not cause our Senior Leverage Ratio (as defined below) to exceed 3.50 to 1.00.

All outstanding revolving loans and term loans under the Amended Credit Facility mature on September 5, 2024. If on or prior to August 16, 2022, we have failed to demonstrate to the Agent that we would be in compliance with each financial covenant after giving pro forma effect to the repayment in full of the Convertible Notes which mature on November 15, 2022, then the Amended Credit Facility will mature on August 16, 2022. In addition, if on any business day during the period beginning on August 16, 2022 until the Convertible Notes are paid in full, our available liquidity is less than an amount equal to 125% of the outstanding principal amount of the Convertible Notes, then amounts outstanding under the Amended Credit Facility are due the next business day.

At our option, amounts outstanding under the Amended Credit Facility accrue interest at a per annum rate equal to either LIBOR, plus a margin ranging from 1.00% to 2.00%, or the Base Rate, plus a margin ranging from 0.00% to 1.00% (“Applicable Margin”). The base LIBOR is, at our discretion, equal to either one, three, or six month LIBOR. The Base Rate is defined as the greater of Wells Fargo's prime rate, the Federal Funds Rate plus 0.50%, or one month LIBOR plus 1.00%. In each case, the Applicable Margin is determined based upon our Net Leverage Ratio, as defined below. Accrued interest on amounts outstanding under the Amended Credit Facility is due and payable quarterly, in arrears, for loans bearing interest at the Base Rate and at the end of the applicable interest period in the case of loans bearing interest at the adjusted LIBOR. Unused commitments under the Revolving Facility are subject to a commitment fee to be paid in arrears on the last day of each fiscal quarter, ranging from 0.15% to 0.35% per annum determined based on our Net Leverage Ratio, as defined below.

Certain of our existing and future material domestic subsidiaries are required to guarantee our obligations under the Amended Credit Facility, and the obligations under the Amended Credit Facility are secured by substantially all of our assets and the assets of the subsidiary guarantors. The Amended Credit Facility contains customary affirmative and negative covenants. The negative covenants limit our and our subsidiaries’ ability to, among other things, incur additional indebtedness, grant liens on our assets, make investments including acquisitions, dispose of assets, or pay dividends or distributions or repurchase our stock, subject in each case to customary exceptions and qualifications. Our covenants also include requirements that we comply with the following financial ratios:

Consolidated Net Leverage Ratio: The Consolidated Net Leverage Ratio ("Net Leverage Ratio"), defined as a ratio of consolidated funded indebtedness less qualified cash and cash equivalents, each as defined in the Amended Credit Facility, on the last day of each fiscal quarter to the sum of the four previous consecutive fiscal quarters' consolidated EBITDA, as defined in the Amended Credit Facility, of no greater than 5.00 to 1.00 (or, at our election following certain material acquisitions, 5.50 to 1.00).

Consolidated Interest Coverage Ratio: The Consolidated Interest Coverage Ratio ("Interest Coverage Ratio"), defined as a ratio of the sum of the four previous fiscal quarters' consolidated EBITDA to our interest expense for the same period, excluding non-cash interest attributable to the Convertible Notes, as defined below, of no less than 3.00 to 1.00.

Consolidated Senior Secured Net Leverage Ratio: The Consolidated Senior Secured Net Leverage Ratio ("Senior Leverage Ratio"), defined as a ratio of consolidated senior secured indebtedness less qualified cash and cash equivalents, each as defined in the Amended Credit Facility, on the last day of each fiscal quarter to the sum of the four previous consecutive fiscal quarters' consolidated EBITDA, of no greater than 3.75 to 1.00 (or, at our election following certain material acquisitions, 4.25 to 1.00).

As of December 31, 2019, we were in compliance with the covenants under our Amended Credit Facility.

The Amended Credit Facility contains customary events of default, subject to customary cure periods for certain defaults. In the event of a default, the obligations under the Amended Credit Facility could be accelerated, the applicable interest rate could be increased, the loan commitments could be terminated, our subsidiary guarantors could be required to pay the obligations in full and our lenders would be permitted to exercise remedies with respect to all of the collateral that is securing the Amended Credit Facility. Any such default that is not cured or waived could have a material adverse effect on our liquidity and financial condition.

Changes resulting from the Amended Credit Facility qualified as modifications to our 2014 Credit Facility for purposes of determining the accounting for new and existing unamortized debt issuance and discount costs. We incurred $3.6 million in financing costs in connection with the Amended Credit Facility. Of this amount, we capitalized $1.8 million as deferred financing costs attributable to the Revolving Facility. This amount, together with the unamortized deferred financing costs from the 2014 Revolving Facility, is being amortized into interest expense ratably over the term of the new facility. We recorded $1.4 million of issuance and debt discount costs associated with the Term Loans as a reduction of the principal balance of such debt. We are amortizing this cost, together with the unamortized deferred financing costs from the 2014 Term Loans, into interest expense using the effective interest method over the term of the new facility. We also immediately recognized $0.4 million of the financing costs as a charge to interest expense.

Our 2014 Credit Facility, which was replaced by the Amended Credit Facility in September 2019, provided $350.0 million in aggregate commitments for revolving loans, with sublimits of $10.0 million for the issuance of letters of credit and $20.0 million for swingline loans. In February 2016, we originated a term loan in the original principal amount of $125.0 million under the 2014 Credit Facility, and in December 2017, we drew funds of $200.0 million available under the delayed draw term loan portion of this agreement.

As of December 31, 2019 and 2018 we had $370.0 million and $350.0 million, respectively, of available revolving credit under the credit facilities in effect at these dates. Principal outstanding for the Revolving Facility was $230.0 million at December 31, 2019. There were no outstanding revolving borrowings at December 31, 2018. We incur commitment fees on the unused portion of the Revolving Facility. The carrying value of the Revolving Facility approximates its fair value.

Unamortized debt issuance costs for the revolving facilities in effect at December 31, 2019 and 2018 were $2.7 million and $1.3 million, respectively, and are included in the line "Other assets" in the Consolidated Balance Sheets.

Principal outstanding and unamortized debt issuance costs for the term loans were as follows at December 31, 2019 and 2018:

	December 31, 2019	December 31, 2018
	Term Loans	
	(in thousands)	
Principal outstanding	$ 596,250	$ 304,990
Unamortized issuance costs	(942)	(777)
Unamortized discount	(1,245)	(498)
Carrying value	$ 594,063	$ 303,715

The fair value of the term loans on December 31, 2019 and 2018 was $582.7 million and $298.9 million, respectively. The fair value was estimated by discounting future cash flows using prevailing market interest rates on debt with similar creditworthiness, terms, and maturities. We concluded that this fair value measurement should be categorized within Level 2.

Future maturities of principal under the Term Loans are as follows for the years ending December 31, in thousands:

	Term Loans
2020	$ 18,750
2021	30,000
2022	33,750
2023	48,750
2024	465,000
	$ 596,250

Convertible Notes

In May 2017, we issued convertible senior notes with aggregate principal of $345.0 million (including the underwriters' exercise in full of their over-allotment option of $45.0 million) which mature on November 15, 2022 ("Convertible Notes"). The Convertible Notes were issued under an indenture dated May 23, 2017 ("Indenture"), by and between us and Wells Fargo Bank, N.A., as Trustee. We received net proceeds from the offering of approximately $304.2 million after adjusting for debt issuance costs, including the underwriting discount, the net cash used to purchase the Note Hedges and the proceeds from the issuance of the Warrants which are discussed below.

The Convertible Notes accrue interest at a rate of 1.50%, payable semi-annually on May 15 and November 15 of each year. On or after May 15, 2022, and until the close of business on the second scheduled trading day immediately preceding the maturity date, holders may convert their Convertible Notes at their option. The Convertible Notes are convertible at an initial rate of 23.84 shares per $1,000 of principal (equivalent to an initial conversion price of approximately $41.95 per share of our common stock). The conversion rate is subject to customary adjustments for certain events as described in the Indenture. Upon conversion, we will pay or deliver, as the case may be, cash, shares of our common stock or a combination of cash and shares of our common stock, at our election. It is our current intent to settle conversions of the Convertible Notes through combination settlement, which involves repayment of the principal portion in cash and any excess of the conversion value over the principal amount in shares of our common stock. Based on our closing stock price of $53.75 on December 31, 2019, the if-converted value exceeded the aggregate principal amount of the Convertible Notes by $97.1 million.

Holders may convert their Convertible Notes, at their option, prior to May 15, 2022 only under the following circumstances:

- during any calendar quarter commencing after the calendar quarter ending on June 30, 2017 (and only during such calendar quarter), if the last reported sale price of our common stock for at least 20 trading days (whether or not consecutive) during a period of 30 consecutive trading days ending on, and including, the last trading day of the immediately preceding calendar quarter is greater than or equal to 130% of the conversion price on each applicable trading day;
- during the five business day period after any five consecutive trading day period (the "Measurement Period") in which the trading price per $1,000 principal amount of the Convertible Notes for each trading day of the Measurement Period was less than 98% of the product of the last reported sales price of our common stock and the conversion rate on each such trading day; or
- upon the occurrence of specified corporate events, as defined in the Indenture.

We may not redeem the Convertible Notes prior to their maturity date, and no sinking fund is provided for them. If we undergo a fundamental change, as described in the Indenture, subject to certain conditions, holders may require us to repurchase for cash all or any portion of their Convertible Notes. The fundamental change repurchase price is equal to 100% of the principal amount of the Convertible Notes to be repurchased, plus accrued and unpaid interest up to, but excluding, the fundamental change repurchase date. If holders elect to convert their Convertible Notes in connection with a make-whole fundamental change, as described in the Indenture, we will, to the extent provided in the Indenture, increase the conversion rate applicable to the Convertible Notes.

The Convertible Notes are senior unsecured obligations and rank senior in right of payment to any of our indebtedness that is expressly subordinated in right of payment to the Convertible Notes and equal in right of payment to any of our existing and future unsecured indebtedness that is not subordinated. The Convertible Notes are effectively junior in right of payment to any of our secured indebtedness (to the extent of the value of assets securing such indebtedness) and structurally junior to all existing and future indebtedness and other liabilities, including trade payables, of our subsidiaries. The Indenture does not limit the amount of debt that we or our subsidiaries may incur. The Convertible Notes are not guaranteed by any of our subsidiaries.

The Indenture does not contain any financial or operating covenants or restrictions on the payment of dividends, the incurrence of indebtedness, or the issuance or repurchase of securities by us or any of our subsidiaries. The Indenture contains customary events of default with respect to the Convertible Notes and provides that upon certain events of default occurring and continuing, the Trustee may, and the Trustee at the request of holders of at least 25% in principal amount of the Convertible Notes shall, declare all principal and accrued and unpaid interest, if any, of the Convertible Notes to be due and payable. In case of certain events of bankruptcy, insolvency or reorganization, involving us or a significant subsidiary, all of the principal of and accrued and unpaid interest on the Convertible Notes will automatically become due and payable.

In accounting for the issuance of the Convertible Notes, we separated the Convertible Notes into liability and equity components. We allocated $282.5 million of the Convertible Notes to the liability component, and $62.5 million to the equity component. The excess of the principal amount of the liability component over its carrying amount is amortized to interest expense over the term of the Convertible Notes using the effective interest method. The equity component will not be remeasured as long as it continues to meet the conditions for equity classification.

We incurred issuance costs of $9.8 million related to the Convertible Notes. Issuance costs were allocated to the liability and equity components based on their relative values. Issuance costs attributable to the liability component are being amortized to interest expense over the term of the Convertible Notes, and issuance costs attributable to the equity component are included along with the equity component in stockholders' equity.

During the third quarter of 2019, we received conversion notices from certain holders with respect to an immaterial amount in aggregate principal of Convertible Notes requesting conversion as a result of the sales price condition having been met during the second quarter of 2019. In accordance with the terms of the Convertible Notes, we made cash payments of the aggregate principal amount and delivered newly issued shares of our common stock for the remainder of the conversion obligation in excess of the aggregate principal amount of the Convertible Notes being converted, in full satisfaction of such converted notes. We received shares of our common stock under the Note Hedges, as defined below, that offset the issuance of shares of common stock upon conversion of the Convertible Notes.

The net carrying amount of the Convertible Notes at December 31, 2019 and 2018, was as follows:

	December 31, 2019	December 31, 2018
	(in thousands)	
Liability component:		
Principal amount	$ 344,995	$ 345,000
Unamortized discount	(35,287)	(46,235)
Unamortized debt issuance costs	(4,520)	(5,922)
	$ 305,188	$ 292,843
Equity component, net of issuance costs and deferred tax:	$ 61,390	$ 61,390

The estimated fair value of the Convertible Notes at December 31, 2019 and 2018 was $486.7 million and $441.4 million, respectively. The estimated fair value is based on quoted market prices as of the last trading day of the year; however, the Convertible Notes have only a limited trading volume and as such this fair value estimate is not necessarily the value at which the Convertible Notes could be retired or transferred. We concluded this measurement should be classified within Level 2.

The following table sets forth total interest expense related to the Convertible Notes for the year ended December 31, 2019, 2018, and 2017:

	December 31, 2019	December 31, 2018	December 31, 2017
		(in thousands)	
Contractual interest expense	$ 5,175	$ 5,175	$ 3,119
Amortization of debt discount	10,948	10,322	5,991
Amortization of debt issuance costs	1,402	1,322	766
	$ 17,525	$ 16,819	$ 9,876

The effective interest rate of the liability component for each of the years ended December 31, 2019, 2018, and 2017 was 5.87%.

Convertible Note Hedges and Warrants

On May 23, 2017, we entered into privately negotiated transactions to purchase hedge instruments (“Note Hedges”), covering approximately 8.2 million shares of our common stock at a cost of $62.5 million. The Note Hedges are subject to anti-dilution provisions substantially similar to those of the Convertible Notes, have a strike price of approximately $41.95 per share, are exercisable by us upon any conversion under the Convertible Notes, and expire on November 15, 2022.

The Note Hedges are generally expected to reduce the potential dilution to our common stock (or, in the event the conversion is settled in cash, to reduce our cash payment obligation) in the event that at the time of conversion our stock price exceeds the conversion price under the Convertible Notes. The cost of the Note Hedges is expected to be tax deductible as an original issue discount over the life of the Convertible Notes, as the Convertible Notes and the Note Hedges represent an integrated debt instrument for tax purposes. The cost of the Note Hedges was recorded as a reduction of our additional paid-in capital in the accompanying Consolidated Financial Statements.

On May 23, 2017, we also sold warrants for the purchase of up to 8.2 million shares of our common stock for aggregate proceeds of $31.5 million (“Warrants”). The Warrants have a strike price of $57.58 per share and are subject to customary anti-dilution provisions. The Warrants will expire in ratable portions on a series of expiration dates commencing on February 15, 2023. The proceeds from the issuance of the Warrants were recorded as an increase to our additional paid-in capital in the accompanying Consolidated Financial Statements.

The Note Hedges are transactions that are separate from the terms of the Convertible Notes and the Warrants, and holders of the Convertible Notes and the Warrants have no rights with respect to the Note Hedges. The Warrants are similarly separate in both terms and rights from the Note Hedges and the Convertible Notes.

10. Stock-based Expense and Employee Benefits

Stock-based Expense

Our Amended and Restated 1998 Stock Incentive Plan (“Stock Incentive Plan”) provided for awards which could be granted in the form of incentive stock options, non-qualified stock options, restricted stock, stock appreciation rights, and performance restricted stock. In August 2010, we discontinued issuance of new awards under the Stock Incentive Plan and concurrently adopted the 2010 Equity Incentive Plan (“Equity Incentive Plan”). The Equity Incentive Plan, as amended, provides for awards which may be granted in the form of incentive stock options, non-statutory stock options, restricted stock, restricted stock units, stock appreciation rights, performance units, and performance shares under substantially the same terms as the Stock Incentive Plan.

We also grant awards to our directors under the Equity Incentive Plan. Prior to 2010, these awards were generally in the form of stock options. Beginning in 2010, the awards granted to our directors are generally in the form of restricted stock. The awards granted to directors generally vest ratably over a period of four quarters; however, should a director leave the board, we have the right to repurchase shares as if the awards vested on a pro rata basis.

Our board of directors periodically approves increases to the number of shares of common stock reserved for issuance under the Equity Incentive Plan. At both December 31, 2019 and 2018, there were 27.6 million shares of our common stock reserved for awards under the Equity Incentive Plan. The Plan permits the exercise of stock options and grants of restricted stock to be fulfilled through the issuance of previously authorized but unissued common stock shares, or the reissuance of shares held in treasury. We primarily utilize treasury shares when stock options are exercised or restricted stock is granted.

The following table represents a consolidated summary of our stock-based plan activity:

	Year Ended December 31,		
	2019	2018	2017
		(in thousands)	
Total compensation expense recognized	$ 62,563	$ 50,641	$ 45,835
Cash proceeds related to stock-based expense transactions	$ 5,833	$ 13,163	$ 27,014
Aggregate grant-date fair value of shares and stock options that vested during the year	$ 49,229	$ 49,711	$ 48,662

Total unrecognized compensation expense related to our stock-based expense plans was $89.6 million at December 31, 2019, and is expected to be recognized over a weighted average period of 2.2 years.

Stock Option Awards

Stock options granted prior to February 2014 generally vested over a period of sixteen quarters, with 75% vesting ratably over fifteen quarters and the remaining 25% vesting in the sixteenth quarter. Beginning in February 2014, stock options granted generally vested ratably over a period of twelve quarters. Expense is recognized over the requisite service period in a manner that reflects the vesting of the related awards. Awards under the plan generally expire ten years from the date of the grant. All outstanding options were granted at exercise prices equal to or exceeding our estimate of the fair market value of our common stock at the date of grant.

The following table summarizes stock option transactions under our Stock Incentive Plan and Equity Incentive Plan:

	Number of Shares	Range of Exercise Prices	Weighted Average Exercise Price
Balance as of January 1, 2017	3,607,089	$ 2.55 – $ 29.50	$ 19.58
Exercised	(1,344,569)	5.04 – 29.50	20.09
Forfeited/cancelled	(61,892)	15.19 – 25.70	19.66
Expired	(163)	2.55 – 2.82	2.73
Balance at December 31, 2017	2,200,465	4.28 – 29.50	19.26
Exercised	(658,564)	4.92 – 29.50	20.00
Forfeited/cancelled	(11,329)	15.19 – 25.70	18.85
Expired	(2,250)	7.00 – 7.00	7.00
Balance at December 31, 2018	1,528,322	4.28 – 29.50	18.96
Exercised	(305,030)	4.28 – 29.50	19.12
Forfeited/cancelled	(725)	18.79 – 20.34	19.79
Other	2,585	17.67 – 27.18	22.59
Balance at December 31, 2019	1,225,152	7.50 – 29.50	18.94

The below table provides information regarding outstanding stock options which were fully vested and exercisable at December 31:

	2019	2018
	Options Fully Vested & Exercisable	Options Fully Vested & Exercisable
Number of options	1,225,152	1,528,322
Weighted-average remaining contractual term (in years)	3.1	4.1
Weighted-average exercise price	$ 18.94	$ 18.96
Aggregate intrinsic value, in thousands	$ 42,650	$ 44,674

The aggregate intrinsic value of options exercised during the years ended December 31, 2019, 2018, and 2017, was $12.3 million, $23.0 million, and $25.1 million, respectively. There were no stock options awarded during the years ended December 31, 2019, 2018, and 2017.

Restricted Stock Awards

Restricted stock awards entitle the holder to receive shares of our common stock as the award vests. Grants of restricted stock are classified as time-based, market-based, or performance-based depending on the vesting criteria of the award.

<u>Time-based restricted stock awards:</u>

Time-based restricted stock awards granted prior to February 2014, generally vest ratably over sixteen quarters following the date of grant. Awards granted during 2014 and 2015, generally vest ratably over a period of twelve quarters with the first vesting on the first day of the quarter immediately following the grant date. Beginning in 2016, awards granted generally vest ratably over a period of twelve quarters with the first vesting on the first day of the second calendar quarter immediately following the grant date. The fair value of time-based restricted stock awards is based on the closing price of our common stock on the date of grant. Compensation expense for time-based restricted stock awards is recognized over the vesting period on a straight-line basis.

A summary of time-based restricted stock award activity is presented in the table below.

	Number of Shares	Weighted Average Grant-Date Fair Value
Non-vested shares at January 1, 2017	1,633,501	$ 20.78
Granted	1,359,578	36.25
Vested	(953,749)	23.73
Forfeited/cancelled	(283,342)	28.01
Non-vested shares at December 31, 2017	1,755,988	30.05
Granted	1,289,866	53.26
Vested	(1,017,367)	31.92
Forfeited/cancelled	(242,675)	40.70
Non-vested shares at December 31, 2018	1,785,812	44.34
Granted	880,594	60.37
Vested	(1,036,973)	42.22
Forfeited/cancelled	(261,416)	52.53
Non-vested shares at December 31, 2019	1,368,017	54.70

Market-based restricted stock awards:

Market-based restricted stock awards become eligible for vesting upon the achievement of specific market-based conditions based on the per share price of our common stock. Shares that become eligible to vest, if any, become Eligible Shares. Eligible Shares generally vest ratably over a period of four quarters, with the first vesting on the first day of the quarter immediately after becoming Eligible Shares. Vesting is conditional upon the recipient remaining a service provider to us, as defined in the plan document, through each applicable vesting date.

A summary of market-based restricted stock award activity is presented in the table below.

	Number of Shares	Weighted Average Grant-Date Fair Value
Balance as of January 1, 2017	1,564,160	$ 12.73
Granted	535,441	28.18
Vested	(1,407,133)	13.69
Forfeited/cancelled	(2,303)	13.34
Balance at December 31, 2017	690,165	22.76
Granted	517,364	35.66
Vested	(677,857)	23.02
Balance at December 31, 2018	529,672	35.03
Granted	489,948	38.24
Vested	(144,455)	33.37
Forfeited/cancelled	(36,703)	35.66
Balance at December 31, 2019	838,462	37.17

We estimate the fair value of market-based restricted stock awards using a discrete model to analyze the fair value of the subject shares. The discrete model utilizes multiple stock price-paths, through the use of a Monte Carlo simulation, which are then analyzed to determine the fair value of the subject shares. The weighted average of assumptions used to value awards granted during 2019, 2018, and 2017 were as follows:

	2019	2018	2017
Risk-free interest rate	2.5%	2.5%	1.8%
Expected volatility	29.6%	31.2%	31.6%

Risk-free interest rate. We estimate the risk-free rate from the U.S. Treasury strip note yield curve for the period corresponding to the expiration date of the grant as of the valuation date.

Expected volatility. We estimate expected volatility based on our historic and implied volatility rate.

Expense related to the market-based restricted stock awards is recognized over the requisite service period using the graded-vesting attribution method. The requisite service period is a measure of the expected time to achieve the specified market condition plus the time-based vesting period. The expected time to achieve the market condition is estimated utilizing a Monte Carlo simulation, considering only those stock price-paths in which the market condition is achieved. The estimated requisite service period for market-based restricted stock shares issued in 2019 ranged from two to twelve quarters. Market-based restricted stock awards granted in 2018 had requisite service periods ranging from six to ten quarters.

Deferred restricted stock awards:

Certain of our acquisitions include restricted stock award agreements for obligations denominated in fixed dollar amounts, subject to continued post-acquisition employment services, and in some cases, the achievement of performance targets for periods ranging from 2020 through 2022. As of December 31, 2019, the estimated intrinsic value of these awards was $22.7 million. The number of restricted shares to be granted will be determined at future dates, based on continued employment services and in some cases the achievement of the performance targets within each agreement, and our share price on the date of satisfaction of the requirements. Awards subject solely to continued post-acquisition employment generally vest ratably over twelve quarters beginning the quarter subsequent to the first anniversary of the acquisition date, while awards subject to performance criteria and continued post-acquisition employment cliff vest at the end of the performance criteria measurement periods. These awards are accounted for under the liability method. For awards subject to performance criteria, we reassess the likelihood of the performance criteria being met at each reporting date based on our expectations of future operating results, and adjust the total compensation expense to be recognized over the vesting period. A fair value liability is recognized as compensation expense is recorded, and is included within "Accrued expenses and other current liabilities" and "Other long-term liabilities" within our Consolidated Balance Sheets. Upon the issuance of these restricted shares the fair value liability will be reclassified to additional paid-in capital.

For the period ended December 31, 2019, the total fair value and compensation expense recognized for these liability awards was $2.2 million. Total unrecognized compensation expense for these awards was $20.7 million at December 31, 2019, and is expected to be recognized over a weighted average period of 3.3 years. Compensation expense for deferred restricted stock arrangements prior to 2019 was de minimis.

Employee Benefit Plans

In 1998, our board of directors approved a defined contribution plan that provides retirement benefits under the provisions of Section 401(k) of the Internal Revenue Code. Our 401(k) Plan ("Plan") covers substantially all employees who meet a minimum service requirement. Contributions of $4.5 million, $4.2 million, and $2.9 million were made by us under the Plan for the years ended December 31, 2019, 2018, and 2017, respectively.

11. Commitments and Contingencies

Guarantor Arrangements

We have agreements whereby we indemnify our officers and directors for certain events or occurrences while the officer or director is or was serving at our request in such capacity. The term of the indemnification period is for the officer or director's lifetime. The maximum potential amount of future payments we could be required to make under these indemnification agreements is unlimited; however, we have a director and officer insurance policy that limits our exposure and enables us to recover a portion of any future amounts paid. As a result of our insurance policy coverage, we believe the estimated fair value of these indemnification agreements is minimal. Accordingly, we had no liabilities recorded for these agreements as of December 31, 2019 or 2018.

In the ordinary course of our business, we include standard indemnification provisions in our agreements with our clients. Pursuant to these provisions, we indemnify our clients for losses suffered or incurred in connection with third-party claims that our products infringed upon any U.S. patent, copyright, trademark, or other intellectual property right. Where applicable, we generally limit such infringement indemnities to those claims directed solely to our products and not in combination with other software or products. With respect to our products, we also generally reserve the right to resolve such claims by designing a non-infringing alternative, by obtaining a license on reasonable terms, or by terminating our relationship with the client and refunding the client's fees.

The potential amount of future payments to defend lawsuits or settle indemnified claims under these indemnification provisions is unlimited in certain agreements; however, we believe the estimated fair value of these indemnification provisions is minimal, and, accordingly, we had no liabilities recorded for these agreements as of December 31, 2019 or 2018.

Litigation

From time to time, in the normal course of our business, we are a party to litigation matters and claims. Litigation can be expensive and disruptive to normal business operations. Moreover, the results of complex legal proceedings are difficult to predict and our view of these matters may change in the future as the litigation and events related thereto unfold. We expense legal fees as incurred. Insurance recoveries associated with legal costs incurred are recorded when they are deemed probable of recovery.

At December 31, 2019 and 2018, we had accrued amounts for estimated settlement losses related to legal matters. We do not believe there is a reasonable possibility that a material loss exceeding amounts already recognized may have been incurred as of the date of the balance sheets presented herein.

We are involved in other legal proceedings and claims, including purported class action lawsuits, not described above that are not likely to be material either individually or in the aggregate based on information available at this time. Our view of these matters may change as the litigation and events related thereto unfold.

Other Matters

During May 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.

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 intend to vigorously pursue repayment of the remaining losses under such insurance coverage. Due to 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 during the fourth quarter of 2018. We also incurred an additional $0.4 million in related expenses. These charges are included in the line "General and administrative" in the accompanying Consolidated Statements of Operations.

12. Net Income per Share

Basic net income per share is computed by dividing the net income by the weighted average number of common shares outstanding during the period. Diluted net income per share is computed by using the weighted average number of common shares outstanding, after giving effect to all potential dilutive common shares outstanding during the period. Included within net income per share is the dilutive effect of outstanding stock options and restricted stock using the treasury stock method. Weighted average shares from common share equivalents of approximately 149,000, 286,000, and 193,000 were excluded from the dilutive shares outstanding because their effect was anti-dilutive for the years ended December 31, 2019, 2018, and 2017, respectively.

For purposes of considering the Convertible Notes in determining diluted net income per share, it is our current intent to settle conversions of the Convertible Notes through combination settlement, which involves repayment of the principal portion in cash and any excess of the conversion value over the principal amount (the "conversion premium") in shares of our common stock. Therefore, only the impact of the conversion premium is included in total dilutive weighted average shares outstanding using the treasury stock method. The dilutive effect of the conversion premium is shown in the table below.

The Warrants sold in connection with the issuance of the Convertible Notes are considered to be dilutive when the average price of our common stock during the period exceeds the Warrants' strike price of $57.58 per share. The effect of the additional shares that may be issued upon exercise of the Warrants is included in total dilutive weighted average shares outstanding using the treasury stock method and is shown in the table below. The Note Hedges purchased in connection with the issuance of the Convertible Notes are considered to be anti-dilutive and therefore do not impact our calculation of diluted net income per share. Refer to Note 9 for further discussion regarding the Convertible Notes.

We exclude common shares subject to a holdback pursuant to business combinations from the calculation of basic weighted average shares outstanding where the release of such shares is contingent upon an event not solely subject to the passage of time. As of December 31, 2019 and 2018, there were approximately 163,000 and 196,000, respectively, contingently returnable shares related to our acquisitions of ClickPay and BluTrend which were excluded from the computation of basic net income per share as these shares are subject to sellers' indemnification obligations and are subject to a holdback. There were no contingently returnable shares as of December 31, 2017. Dilutive common shares outstanding include the weighted average contingently issuable shares discussed above that are subject to a holdback. These shares are subject to release to the sellers on the second anniversary dates of the acquisitions which are contingent on the sellers' indemnification obligations.

The following table presents the calculation of basic and diluted net income per share attributable to common stockholders:

	Year Ended December 31,		
	2019	2018	2017
	(in thousands, except per share amounts)		
Numerator:			
Net income	$ 58,208	$ 34,725	$ 377
Denominator:			
Basic:			
Weighted average shares used in computing basic net income per share:	92,017	87,290	79,433
Diluted:			
Add weighted average effect of dilutive securities:			
Stock options and restricted stock	1,368	2,032	2,884
Convertible Notes and Warrants	2,675	1,948	81
Contingently issuable shares in connection with our acquisitions	222	261	—
Weighted average shares used in computing diluted net income per share:	96,282	91,531	82,398
Net income per share:			
Basic	$ 0.63	$ 0.40	$ 0.00
Diluted	$ 0.60	$ 0.38	$ 0.00

13. Income Taxes

The domestic and foreign components of income before income taxes were as follows:

	Year Ended December 31,		
	2019	2018	2017
	(in thousands)		
Domestic	$ 60,024	$ 32,190	$ 12,424
Foreign	534	2,110	2,817
Total	$ 60,558	$ 34,300	$ 15,241

Our income tax expense (benefit) consisted of the following components:

	Year Ended December 31,		
	2019	2018	2017
	(in thousands)		
Current:			
Federal	$ (1,769)	$ 666	$ 36
State	478	295	578
Foreign	1,536	738	313
Total current income tax expense	245	1,699	927
Deferred:			
Federal	3,284	(1,543)	14,620
State	366	(255)	(900)
Foreign	(1,545)	(326)	217
Total deferred income tax expense (benefit)	2,105	(2,124)	13,937
Total income tax expense (benefit)	$ 2,350	$ (425)	$ 14,864

The reconciliation of our income tax expense computed at the U.S. federal statutory tax rate to the actual income tax expense is as follows:

	Year Ended December 31,		
	2019	2018	2017
		(in thousands)	
Expense derived by applying the Federal income tax rate to income before income taxes	$ 12,717	$ 7,203	$ 5,335
State income tax, net of federal benefit	728	(204)	135
Foreign income tax	63	26	(631)
Change in valuation allowance	(91)	734	—
Nondeductible officer compensation	1,329	1,092	431
Other nondeductible expenses	1,095	1,095	1,175
Stock-based expense	(2,142)	(11,788)	(19,080)
Research and development credit	(10,765)	—	—
Federal income tax rate reduction	—	—	25,070
Deemed repatriation of foreign earnings	—	—	2,211
Base erosion and anti-abuse tax	(1,117)	1,117	—
Other	533	300	218
Total income tax expense (benefit)	$ 2,350	$ (425)	$ 14,864

Our effective tax rate of 3.9% for the year ended December 31, 2019 was higher than our effective tax rate of (1.2)% for the year ended December 31, 2018 primarily due to lower excess tax benefits realized from stock-based compensation offset in part by benefits from federal and state research and development credits from a study conducted during the quarter ended December 31, 2019 for tax years 2013 through 2018 and the reversal of estimated base erosion and anti-avoidance tax (“BEAT”) accrued during 2018 pursuant to the 2017 U.S. tax reform commonly known as the Tax Cuts and Jobs Act (“TCJA”). During the quarter ended June 30, 2019, we completed a review of certain U.S. tax reform elements primarily related to BEAT and verified the existence of required information to confirm our eligibility for certain exceptions allowed under the BEAT provisions. As a result, we determined that we no longer had liability related to the BEAT as clarified in additional guidance from proposed regulations issued on December 13, 2018 and finalized on December 6, 2019.

Our effective tax rate of 97.5% for the year ended December 31, 2017 was higher than the rate for 2018 primarily as a result of significant changes to the Internal Revenue Code resulting from the TCJA which was signed into law on December 22, 2017. Changes included, but were not limited to, a federal corporate tax rate decrease 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. As a result of the TCJA, we recorded $25.1 million of additional income tax expense in the fourth quarter of 2017, the period in which the legislation was enacted, to reduce the carrying value of our net deferred tax assets to reflect the lower U.S. federal corporate tax rate. We also recognized tax expense of $2.2 million as a result of the deemed repatriation of foreign earnings.

Under the TCJA, we are also subject to current tax on Global Intangible Low-Taxed Income (“GILTI”) earned by foreign subsidiaries. The FASB Staff Q&A Topic No. 5, *Accounting for Global Intangible Low-Taxed Income,* states that an entity can make an accounting policy election either to recognize deferred taxes for temporary differences that are expected to reverse as GILTI in future years or provide for the tax expense related to GILTI resulting from those items in the year the tax is incurred. We are electing to recognize GILTI as a period expense in the period the tax is incurred.

On December 22, 2017, the SEC issued Staff Accounting Bulletin No. 118 ("SAB 118") to address the application of US GAAP in situations where a registrant did not have the necessary information available, prepared, or analyzed (including computations) in reasonable detail to complete the accounting for certain income tax effects of the TCJA. In accordance with SAB 118, we determined in 2017 that the $25.1 million of deferred tax expense recorded in connection with the remeasurement of our net deferred tax assets and the $2.2 million of tax expense recorded in connection with the transition tax on the mandatory deemed repatriation of foreign earnings were provisional amounts and were reasonable estimates at December 31, 2017. In 2018, we completed our assessment of the effects of the adoption of the TCJA. There were no material changes to our original estimates.

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

	December 31, 2019	December 31, 2018
	(in thousands)	
Deferred tax assets:		
Reserves, deferred revenue and accrued liabilities	$ 8,015	$ 17,120
Stock-based expense	8,635	8,408
Lease liabilities	31,686	—
Net operating loss carryforwards and tax credits	69,043	56,210
Deferred tax assets before valuation allowance	117,379	81,738
Valuation allowance	(1,233)	(1,251)
Total deferred tax assets, net of valuation allowance	116,146	80,487
Deferred tax liabilities:		
Property, equipment, and software	(16,270)	(16,810)
Right-of-use assets	(25,412)	—
Intangible assets	(30,914)	(13,580)
Other	(12,091)	(7,495)
Total deferred tax liabilities	(84,687)	(37,885)
Net deferred tax assets[1]	$ 31,459	$ 42,602

[1] Includes net deferred tax assets and liabilities from the acquisition of Buildium, LLC and Investor Management Services, LLC discussed in Note 3.

We recognize valuation allowances on deferred tax assets if it is more likely than not that some or all of the deferred tax assets will not be realized. We had valuation allowances against certain deferred tax assets of $1.2 million and $1.3 million as of December 31, 2019 and 2018, respectively. In 2019, we eliminated $0.8 million of valuation allowance related to stock compensation as well as the underlying deferred tax asset related to stock-based expense as we do not expect to realize these assets in the future. In 2019, we recognized additional valuation allowance of $0.2 million against net operating losses in a UK subsidiary, and $0.5 million against certain deferred tax assets associated with capital loss carryforwards.

As of December 31, 2019, our federal, state, and international net operating loss ("NOL") carryforwards are $237.7 million, $97.7 million, and $8.4 million, respectively. These carryforwards combined with federal, state and international tax credits of $12.7 million comprise a major component of our deferred tax assets. If not used, the underlying federal NOLs will begin to expire in 2026. The state NOLs will begin to expire in 2020, with approximately $1.1 million expiring in the next five years. If not used, $0.1 million of our tax credits will expire in 2026, and the remaining credits will begin to expire in 2034. Approximately $0.7 million of our tax credits will be fully realizable by 2021. Our NOL carryforward balance partially consists of $54.1 million subject to Section 382 limitations, as these balances were generated by subsidiaries prior to our acquiring them as part of current and previous stock acquisitions. If unused, these NOLs begin to expire in 2026.

Our subsidiary in Hyderabad, India benefits from a tax holiday under the Special Economic Zone program. This benefit was initially granted on July 8, 2013 and applies to a portion of our operations in this location. The benefit was reduced from a 100% tax holiday to a 50% tax holiday in April 2018 and is set to expire in April 2023. We realized tax savings of $0.4 million, $0.1 million, and $0.4 million for the years ended December 31, 2019, 2018, and 2017, respectively, from the tax holiday.

Our subsidiary in Manila, Philippines benefits from income tax holiday incentives pursuant to registration with the Philippine Economic Zone Authority ("PEZA"). Tax savings realized under the Philippine tax holiday incentives were $0.1 million, $0.3 million, and $0.2 million for the years ended December 31, 2019, 2018, and 2017, respectively. The income tax holiday is set to expire in June 2021.

Uncertain Tax Positions

At December 31, 2019 and 2018, we had no unrecognized tax benefits. Our policy is to include interest and penalties related to unrecognized income tax benefits in income tax expense, and as of December 31, 2019 and 2018, there were no accrued interest and penalties.

We file consolidated and separate tax returns in the U.S. and seven foreign jurisdictions. We are no longer subject to U.S. federal income tax examinations for years before 2016 and are no longer subject to state and local income tax examinations by tax authorities for years before 2015; however, net operating losses from all years continue to be subject to examinations and adjustments for at least three years following the year in which the attributes are used.

Our subsidiary, RealPage India Private Limited ("RealPage India"), is currently undergoing an income tax examination for the fiscal years beginning April 1, 2011, April 1, 2012, and April 1, 2013. The India income tax authorities have assessed RealPage India additional tax and interest of $0.9 million as a result of these examinations. We believe the assessments are incorrect and have appealed the decisions to the India Commissioner of Income Tax.

14. Fair Value Measurements

Assets and liabilities measured at fair value on a recurring basis:

Interest rate swap agreements: The fair value of our interest rate derivatives is determined using widely accepted valuation techniques including discounted cash flow analysis on the expected cash flows of the derivatives. This analysis reflects the contractual terms of the derivatives, including the period to maturity, and uses observable market-based inputs, including interest rate curves. We incorporate credit valuation adjustments to appropriately reflect both our own nonperformance risk and the respective counterparty's nonperformance risk in the fair value measurements.

Although the credit valuation adjustments associated with our derivatives utilize Level 3 inputs, such as estimates of current credit spreads, we have determined that the majority of the inputs used to value our derivatives fall within Level 2 of the fair value hierarchy. We have assessed the significance of the impact of the credit valuation adjustments on the overall valuation of our derivative positions and determined that the credit valuation adjustments are not significant to the overall valuation of our interest rate swaps. As a result, we determined that our interest rate swap valuation in its entirety is classified in Level 2 of the fair value hierarchy.

Foreign currency forward contracts: We enter into foreign exchange currency contracts to hedge fluctuations associated with foreign currency denominated monetary assets and liabilities, and the future payment of operating expenses by certain of our non-U.S. subsidiaries. The fair values of our foreign exchange currency contracts are based on quoted foreign exchange forward rates at the reporting date and are classified within Level 2 of the fair value hierarchy.

Contingent consideration obligations: The fair value of the contingent consideration obligations includes inputs not observable in the market and thus represents a Level 3 measurement. The amount to be paid under these obligations is contingent upon the achievement of stipulated operational or financial targets by the business subsequent to acquisition. The fair value for our contingent consideration obligations is estimated based on management's assessment of the probability of achievement of operational or financial targets. The fair value estimate considers the projected future operating or financial results for the factor upon which the respective contingent obligation is dependent. The fair value estimate is generally sensitive to changes in these projections. We develop the projected future operating results based on an analysis of historical results, market conditions, and the expected impact of anticipated changes in our overall business and/or product strategies.

At December 31, 2019, the contingent consideration obligation consisted of a potential obligation related to our Hipercept acquisition. The fair value for this contingent consideration obligation is estimated using a probability weighted discount model which considers the achievement of the conditions upon which the contingent obligation is dependent. The probability of achieving the specified conditions is generally assessed by applying a Monte Carlo weighted-average model. Inputs into the valuation model include a discount rate specific to the acquired entity, a measure of the estimated volatility, and the risk free rate of return, which for the period ended December 31, 2019 were 13.2%, 11.7% and 1.6%, respectively.

At December 31, 2018, the contingent consideration obligation consisted of a potential obligation related to our LeaseLabs acquisition. During the second quarter of 2019, we paid the contingent consideration obligation related to our LeaseLabs acquisition for $6.0 million.

The following tables disclose the assets and liabilities measured at fair value on a recurring basis as of December 31, 2019 and 2018, by the fair value hierarchy levels as described above:

	Fair Value at December 31, 2019			
	Total	Level 1	Level 2	Level 3
	(in thousands)			
Assets:				
Foreign currency forward contracts [1]	$ 237	$ —	$ 237	$ —
Total assets measured at fair value	$ 237	$ —	$ 237	$ —
Liabilities:				
Interest rate swap agreements	$ 2,193	$ —	$ 2,193	$ —
Foreign currency forward contracts	14	—	14	—
Contingent consideration related to the acquisition of:				
Hipercept	6,536	—	—	6,536
Total liabilities measured at fair value	$ 8,743	$ —	$ 2,207	$ 6,536

[1] The fair value of foreign currency forward contracts include those designated as cash flow hedge instruments and those designated as balance sheet hedge instruments.

	Fair Value at December 31, 2018			
	Total	Level 1	Level 2	Level 3
	(in thousands)			
Assets:				
Interest rate swap agreements	$ 923	$ —	$ 923	$ —
Total assets measured at fair value	$ 923	$ —	$ 923	$ —
Liabilities:				
Interest rate swap agreements	$ 413	$ —	$ 413	$ —
Contingent consideration related to the acquisition of:				
LeaseLabs	6,000	—	—	6,000
Total liabilities measured at fair value	$ 6,413	$ —	$ 413	$ 6,000

There were no transfers between Level 1 and Level 2, or between Level 2 and Level 3 measurements during the years ended December 31, 2019 and 2018.

Changes in the fair value of Level 3 measurements for the reporting periods were as follows during the years ended December 31, 2019 and 2018:

	December 31,	
	2019	2018
	(in thousands)	
Balance at beginning of period	$ 6,000	$ 414
Initial contingent consideration fair value	6,700	7,000
Settlements through cash payments	(5,963)	(247)
Net gain on change in fair value	(201)	(1,167)
Balance at end of period	$ 6,536	$ 6,000

Gains and losses resulting from changes in the fair value of the above liabilities are included in “General and administrative” expense in the accompanying Consolidated Statements of Operations.

Assets and liabilities measured at fair value on a non-recurring basis:

CompStak

In August 2016, we acquired a $3.0 million noncontrolling interest in CompStak, Inc. ("CompStak"), which is an unrelated company that specializes in the aggregation of commercial lease data. We have elected the measurement alternative for the CompStak equity investment, whereby we measure the investment at cost, less any impairment, plus or minus changes resulting from observable price changes in orderly transactions for an identical or similar investment of the same issuer. During the first quarter of 2019, we recorded a gain of $2.6 million based on an observable price change, which is reflected in the line "Interest expense and other, net" in the accompanying Condensed Consolidated Statements of Operations. The factors considered in the remeasurement included the price at which the investee issued equity instruments similar to those of our investment and the rights and preferences of those equity instruments compared to ours. We concluded that this fair value measurement should be categorized within Level 2.

In June 30, 2019, we invested an additional $1.8 million in CompStak. The carrying value of this investment at December 31, 2019 and 2018 was $7.4 million and $3.0 million, respectively, and is included in "Other assets" in the accompanying Condensed Consolidated Balance Sheets.

WayBlazer

In January 2018, we paid $2.0 million in cash in return for a convertible promissory note ("Note") from WayBlazer, Inc. ("WayBlazer"), which was an unrelated company that specialized in an artificial intelligence platform for the travel industry. During 2018, WayBlazer voluntarily filed Chapter 7 bankruptcy and ceased all operations. We were unable to determine the fair value of a recovery, if any, and therefore determined our investment in WayBlazer to be fully impaired, resulting in a non-operating loss of $2.0 million recognized in "Interest expense and other, net" in the accompanying Consolidated Statements of Operations.

Refer to Note 8 for further information about assets measured at fair value on a non-recurring basis at December 31, 2019 and 2018. There were no liabilities measured at fair value on a non-recurring basis at December 31, 2019 and 2018.

15. Stockholders' Equity

Stock Repurchase Program

In October 2018, our board of directors approved a share repurchase program authorizing the repurchase of up to $100.0 million of our outstanding common stock. The share repurchase program expired on October 25, 2019. In November 2019, 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 November 7, 2020.

Shares repurchased under the stock repurchase program are retired. Repurchase activity during the years ended December 31, 2019, 2018 and 2017 was as follows:

	Year Ended December 31,		
	2019	2018	2017
Number of shares repurchased	158,971	599,664	—
Weighted-average cost per share	$ 53.41	$ 46.83	$ —
Total cost of shares repurchased, in thousands	$ 8,491	$ 28,082	$ —

Shelf Registration and Public Offering

On May 21, 2018, we filed a shelf registration statement on Form S-3 (File No. 333-225074) with the SEC, which became effective upon filing. The shelf registration allows us to sell, from time to time, an unspecified number of shares of common stock; shares of preferred stock; debt securities; warrants to purchase shares of common stock, preferred stock, or other securities; purchase contracts; and units representing two or more of the foregoing securities.

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.

Increase in Authorized Shares

On June 5, 2018, our stockholders approved an amendment to our Certificate of Incorporation to increase the authorized number of shares of our Common Stock from 125,000,000 to 250,000,000 shares. Our board of directors had previously approved the amendment in 2018.

16. Derivative Financial Instruments and Hedging Activities

Cash Flow Hedges

Interest Rate Swap Agreements

We are exposed to interest rate risk on our variable rate debt. We have entered into interest rate swap agreements to effectively convert portions of our variable rate debt to a fixed-rate basis. The principal objective of these contracts is to eliminate or reduce the variability of the cash flows in interest payments associated with our variable rate debt, thus reducing the impact of interest rate changes on future interest payment cash flows. These derivative instruments are designated as cash flow hedges, as defined in ASC 815, and are assessed for effectiveness against the underlying exposure every reporting period.

On March 31, 2016, we entered into two interest rate swap agreements (collectively the “2016 Swap Agreements”). The 2016 Swap Agreements covered an aggregate notional amount of $75.0 million from March 2016 to September 2019 by replacing the obligation’s variable rate with a blended fixed rate of 0.89%. The 2016 Swap Agreements matured on September 30, 2019.

On December 24, 2018, we entered into two interest rate swap agreements (collectively the “2018 Swap Agreements”). The 2018 Swap Agreements cover an aggregate notional amount of $100.0 million from December 2018 to February 2022 by replacing the obligation’s variable rate with a blended fixed rate of 2.57%. We designated both the 2016 and 2018 Swap Agreements (collectively the “Swap Agreements”) as cash flow hedges of interest rate risk.

The changes in the fair value of the Swap Agreements is recorded in accumulated other comprehensive income and is subsequently reclassified into earnings in the period that the hedged forecasted transaction affects earnings. Amounts reported in accumulated other comprehensive income related to the Swap Agreements will be reclassified to “Interest expense and other, net” in the accompanying Consolidated Statements of Operations as interest payments are made on our variable rate debt.

Foreign Currency Forward Contracts

We are exposed to market risk that includes changes in foreign exchange rates. We have operations in certain foreign countries where the functional currency is the local currency. For international operations that are determined to be extensions of the parent company, the U.S. dollar is the functional currency. As of December 31, 2019, we have entered into a series of foreign exchange forward contracts with a total notional amount of $15.0 million to hedge the effect of adverse fluctuations in foreign currency exchange rates for the Indian rupee and Philippines peso. These contracts are designated as cash flow hedges, as defined by ASC 815, of forecasted transactions, are intended to offset the impact of exchange rate fluctuations on future operating costs, and are scheduled to mature within twelve months.

The changes in the fair value of these contracts are initially reported in accumulated other comprehensive income and are subsequently reclassified into “Cost of revenue” and “Operating expenses” in the accompanying Consolidated Statements of Operations in the same period that the hedge transaction affects earnings.

The table below presents the fair value of the derivative instruments designated as cash flow hedges as well as their classification in the Consolidated Balance Sheets as of December 31, 2019 and 2018:

		Fair Value at	
	Balance Sheet Location	**December 31, 2019**	**December 31, 2018**
		(in thousands)	
Derivatives designated as cash flow hedging instruments:			
Assets:			
Interest rate swaps	Other assets	$ —	$ 923
Foreign currency forward contracts	Other current assets	217	—
Total derivative assets		$ 217	$ 923
Liabilities:			
Interest rate swaps	Other long-term liabilities	$ 2,193	$ 413
Foreign currency forward contracts	Other current liabilities	14	—
Total derivative liabilities		$ 2,207	$ 413

As of December 31, 2019, we have not posted any collateral related to our derivative instruments. If we had breached any of the default provisions at December 31, 2019, we could have been required to settle our obligations under the agreements at their termination value of $2.0 million.

The table below presents the amount of gains and losses related to the derivative instruments and their location in the Consolidated Statements of Operations and the Consolidated Statements of Comprehensive Income for the fiscal years ended December 31, 2019, 2018 and 2017:

Derivatives designated as cash flow hedging instruments:	**Gain (Loss) Recognized in OCI**				**Gain Recognized in Income**		
Year ended December 31,	**2019**	**2018**	**2017**	**Location of Gain (Loss) Recognized in Income**	**2019**	**2018**	**2017**
Swap agreements, net of tax	$ (1,477)	$ 61	$ 318	Interest expense and other	$ 403	$ 613	$ 77
Foreign currency forward contracts, net of tax	244	—	$ —	Cost of revenue and operating expenses	74	—	—

As of December 31, 2019, we estimate that $0.9 million of the net loss related to derivatives designated as cash flow hedges recorded in other comprehensive income is expected to be reclassified into earnings within the next twelve months.

Gains and losses on our cash flow hedges are net of income tax expense (benefit) of $0.9 million, $0.2 million, and $(0.1) million during the years ended December 31, 2019, 2018, and 2017, respectively.

Balance Sheet Hedges

We also enter into foreign currency forward contracts to hedge fluctuations associated with foreign currency denominated monetary assets and liabilities, primarily associated with our lease liabilities. These forward contracts are not designated for hedge accounting treatment, therefore, the change in fair value of these derivatives is recorded as a component of "General and administrative" in the accompanying Consolidated Statements of Operations and offsets the change in fair value of the foreign currency denominated assets and liabilities, which are also recorded in "General and administrative". As of December 31, 2019, the notional amounts of outstanding foreign currency contracts entered into under our balance sheet hedge program was $2.8 million. The effect of derivatives not designated as hedge instruments for the year ended December 31, 2019 was de minimis.

17. Customer Deposits Held in Restricted Accounts

In connection with our payment processing services, we collect tenant funds and subsequently remit these tenant funds to our clients after varying holding periods. These funds are settled through our Originating Depository Financial Institution ("ODFI") custodial accounts at major banks. The ODFI custodial account balance was $222.4 million and $132.2 million, and the related client deposit liability was $222.4 million and $132.2 million at December 31, 2019 and 2018, respectively. The ODFI custodial account balances are included in our Consolidated Balance Sheets as restricted cash. The corresponding liability for these custodial balances is reflected as client deposits. In connection with the timing of our payment processing services, we are exposed to credit risk in the event of nonperformance by other parties, such as returned checks. We utilize credit analysis and other controls to manage the credit risk exposure. We have not experienced any material credit losses to date. Any expected losses are included in our allowance for doubtful accounts. The ODFI custodial accounts are in the name of RealPage wholly-owned subsidiaries. The obligations under the ODFI custodial account agreements are guaranteed by us.

We offer invoice processing services to our clients as part of our overall utility management solution. This service includes the collection of invoice payments from our clients and the remittance of payments to the utility company. We had $14.7 million and $15.1 million in restricted cash and $14.7 million and $15.1 million in client deposits related to these services at December 31, 2019 and 2018, respectively.

In connection with our renter insurance products, we collect premiums from policy holders and subsequently remit the premium, net of our commission, to the underwriter. We maintain separate accounts for these transactions. We had $6.2 million and $7.3 million in restricted cash related to these renter insurance products at December 31, 2019 and 2018, respectively. Related to these renter insurance products, we had $6.2 million and $7.3 million in client deposits at December 31, 2019 and 2018, respectively.

18. Selected Quarterly Financial Data (unaudited)

The following is unaudited quarterly financial information for the years ended December 31, 2019 and 2018 (in thousands, except per share amounts).

	Three Months Ended							
	December 31, 2019	September 30, 2019	June 30, 2019	March 31, 2019	December 31, 2018	September 30, 2018	June 30, 2018	March 31, 2018
Revenue:								
On demand	$ 246,235	$ 245,637	$ 235,185	$ 226,519	$ 218,051	$ 215,413	$ 206,945	$ 193,300
Professional and other	8,532	9,565	8,676	7,787	8,923	9,540	9,307	8,001
Total revenue	254,767	255,202	243,861	234,306	226,974	224,953	216,252	201,301
Gross profit	143,008	146,104	138,253	134,598	129,482	130,467	125,183	120,169
Net income	20,169	11,704	15,063	11,272	6,272	9,073	8,479	10,901
Net income per share attributable to common stockholders:								
Basic	$ 0.22	$ 0.13	$ 0.16	$ 0.12	$ 0.07	$ 0.10	$ 0.10	$ 0.13
Diluted	0.21	0.12	0.16	0.12	0.07	0.09	0.09	0.13

The above quarterly financial information should be read in conjunction with the Consolidated Financial Statements and notes thereto included herein.

19. Subsequent Events

Modern Message

On January 22, 2020, we entered into an Agreement and Plan of Merger, by which we acquired all of the outstanding stock of Modern Message Inc., a provider of resident engagement solutions to the multifamily housing industry. Aggregate purchase consideration was $65.2 million, comprised of $63.4 million paid at closing and deferred cash obligations of up to $1.8 million, subject to working capital adjustments. The deferred cash obligations are subject to indemnification claims and will be released in part on the first anniversary of the closing with the remainder released on the second anniversary of closing. In addition, the purchase agreement provides for at least $10.0 million of management incentives that may be paid in cash or stock, and which require post-acquisition employment services over a period of three years.

Due to the timing of this acquisition, certain disclosures required by ASC 805, including the allocation of the purchase price, have been omitted because the initial accounting for the business combination was incomplete as of the filing date of this report. Such information will be included in a subsequent Quarterly Report on Form 10-Q.

Item 9. Changes in and Disagreements With Accountants on Accounting and Financial Disclosure.

None.

Item 9A. Controls and Procedures.

Evaluation of Disclosure Controls and Procedures

Pursuant to Rule 13a-15(b) and Rule 15d-15(b) under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), we carried out an evaluation, with the participation of our management, and under the supervision of our Chief Executive Officer and Chief Financial Officer, of the effectiveness of our disclosure controls and procedures (as defined under Rule 13a-15(e) and 15d-15(e) under the Exchange Act) as of the end of the period covered by this Annual Report on Form 10-K. Based upon that evaluation, our Chief Executive Officer and Chief Financial Officer concluded that our disclosure controls and procedures were not effective because of certain individual control deficiencies related to our information technology general controls ("ITGCs") that, when viewed in combination, aggregated to the material weakness described below. Management's assessment of the effectiveness of our disclosure controls and procedures is expressed at the level of reasonable assurance because management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives.

Management's Report on Internal Control over Financial Reporting

Our internal controls over financial reporting are designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles in the United States. Management is responsible for establishing and maintaining adequate internal control over financial reporting. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions or that the degree or compliance with the policies or procedures may deteriorate.

Under supervision and with participation of management, including the Chief Executive Officer and Chief Financial Officer, we conducted an evaluation of the effectiveness of internal control over financial reporting as of December 31, 2019. In conducting this evaluation, management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO") in Internal Control — Integrated Framework (2013 framework). Management's assessment of and conclusion on the effectiveness of internal control over financial reporting did not include the internal controls of certain businesses which we acquired during 2019 (i.e. LeaseTerm Solutions, Hipercept, Simple Bills, IMS, and Buildium), which businesses are included in our 2019 Consolidated Financial Statements.

- LeaseTerm Solutions constituted approximately 1% of our consolidated total assets as of December 31, 2019, and less than 1% of our consolidated total revenues for the year then ended.
- Hipercept constituted approximately 1% of our consolidated total assets as of December 31, 2019, and less than 1% of our consolidated total revenues for the year then ended.
- Simple Bills constituted less than 1% of our consolidated total assets as of December 31, 2019, and less than 1% of our consolidated total revenues for the year then ended.
- IMS constituted approximately 2% of our consolidated total assets as of December 31, 2019, and less than 1% of our consolidated total revenues for the year then ended.
- Buildium constituted approximately 20% of our consolidated total assets as of December 31, 2019, and less than 1% of our consolidated total revenues for the year then ended.

Based on our evaluation using criteria set by COSO, management concluded that our internal control over financial reporting was not effective as of December 31, 2019.

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

As part of our evaluation, management has identified certain individual control deficiencies related to our ITGCs that, when viewed in combination, aggregated to a material weakness. Specifically, we did not maintain effective controls over user access to certain IT systems and related changes to IT programs and data, and, as a result, the effective functioning of certain process-level automated and IT-dependent controls may have been affected. The material weakness did not result in any financial statement modifications, and there have been no changes to our previously disclosed financial results.

The effectiveness of internal control over financial reporting as of December 31, 2019 has been audited by Ernst & Young LLP, our independent registered public accounting firm, which is stated in their report included in Part II Item 8 of this Annual Report on Form 10-K.

Remediation Plan

Management has been taking actions to remediate the deficiencies that in combination resulted in the material weakness and to improve the design and effectiveness of our ITGCs. The remedial activities include the following:

- Expanding the management and governance over IT system controls.
- Implementing enhanced process controls around internal user access management including provisioning, removal, and periodic review.
- Further restricting privileged access and improving segregation of duties within IT environments based on roles and responsibilities.
- Strengthening the security environment around certain applications, IT programs or databases.
- Strengthening internal user authentication mechanisms following established policy requirements.

We have completed certain of such remediation activities as of the date of this report and believe that we have strengthened our ITGCs to address the identified material weakness. However, control weaknesses are not considered remediated until new internal controls have been operational for a period of time, are tested, and management concludes that these controls are operating effectively. We will continue to monitor the effectiveness of these remediation measures, and we will make any changes to the design of this plan and take such other actions that we deem appropriate given the circumstances. We expect to complete the remediation process as early as practicable in 2020.

Changes in Internal Controls

There were no significant changes in our internal control over financial reporting during the three months ended December 31, 2019 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Inherent Limitations of Internal Controls

Our management, including our Chief Executive Officer and Chief Financial Officer, does not expect that our disclosure controls and procedures or our internal controls will prevent all error and all fraud. A control system, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, within the company have been detected. These inherent limitations include the realities that judgments in decision-making can be faulty, and that breakdowns can occur because of a simple error or mistake. Additionally, controls can be circumvented by the individual acts of some persons, by collusion of two or more people, or by management override of the control. The design of any system of controls also is based in part upon certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions. Over time, controls may become inadequate because of changes in conditions, or the degree of compliance with the policies or procedures may deteriorate. Because of the inherent limitations in a cost-effective control system, misstatements due to error or fraud may occur and not be detected.

Item 9B. Other Information.

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

The information required by this item is incorporated by reference to RealPage's Proxy Statement for its 2020 Annual Meeting of Stockholders to be filed with the SEC within 120 days after the end of the fiscal year ended December 31, 2019.

Item 11. Executive Compensation.

The information required by this item is incorporated by reference to RealPage's Proxy Statement for its 2020 Annual Meeting of Stockholders to be filed with the SEC within 120 days after the end of the fiscal year ended December 31, 2019.

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

The information required by this item is incorporated by reference to RealPage's Proxy Statement for its 2020 Annual Meeting of Stockholders to be filed with the SEC within 120 days after the end of the fiscal year ended December 31, 2019.

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

The information required by this item is incorporated by reference to RealPage's Proxy Statement for its 2020 Annual Meeting of Stockholders to be filed with the SEC within 120 days after the end of the fiscal year ended December 31, 2019.

Item 14. Principal Accounting Fees and Services.

The information required by this item is incorporated by reference to RealPage's Proxy Statement for its 2020 Annual Meeting of Stockholders to be filed with the SEC within 120 days after the end of the fiscal year ended December 31, 2019.

PART IV

Item 15. Exhibits and Financial Statement Schedules.

(a) Financial Statements

(1) The financial statements filed as part of this Annual Report on Form 10-K are listed on the index to financial statements.

(2) Any financial statement schedules required to be filed as part of this Annual Report on Form 10-K are set forth in section (c) below.

(b) Exhibits

See Exhibit Index at the end of this Annual Report on Form 10-K, which is incorporated by reference.

(c) Financial Statement Schedules

The following schedule is filed as part of this Annual Report on Form 10-K:

All other schedules have been omitted because the information required to be presented in them is not applicable or is shown in the financial statements or related notes.

SCHEDULE II — VALUATION AND QUALIFYING ACCOUNTS

REALPAGE, INC.

December 31, 2019

(in thousands)

Accounts receivable allowances

	Balance at Beginning of Year	Adoption of ASC 606	Additions Charged to Income [2]	Deductions [3]	Balance at End of Year
Year ended December 31:					
2017	$ 2,468	$ —	$ 4,458	$ (2,975)	$ 3,951
2018 [1]	3,951	4,702	17,180	(16,983)	8,850
2019	8,850	—	22,718	(21,297)	10,271

Accounts receivable allowances represent a reserve for credits and an estimate for uncollectible accounts.

(1) In 2018, we adopted ASU 2014-09, under the modified retrospective method. Under the new standard, we accrue for credit accommodations in our reserve during the month of billing, and credits reduce this reserve when issued. Comparative information from prior year periods has not been restated and continues to be reported under the accounting standards in effect for those periods.

(2) Allowance for doubtful accounts are charged to expense. Credit accommodations are charged to revenue.

(3) Applied credits and uncollectible accounts written off, net of recoveries.

EXHIBIT INDEX

Exhibit Number	Exhibit Description	Incorporated by Reference Form	Date	Number	Included Herewith
2.1	Acquisition Agreement dated April 19, 2018 by and among the Registrant and each of the holders of outstanding membership units of NovelPay LLC, a Delaware limited liability company, other than those owned by ClickPay Services, Inc., a Delaware corporation, and NP Representative, LLC, a Delaware limited liability company, solely in its capacity as the Sellers' Representative**	10-Q	5/10/2018	2.1	
2.2	Agreement and Plan of Merger by and among the Registrant, RP Newco XXIII Inc., a Delaware corporation and wholly-owned subsidiary of Registrant, RP Newco XXIV Inc., a Delaware corporation and wholly-owned subsidiary of Registrant, ClickPayServices, Inc., a Delaware corporation and NP Representative, LLC, a Delaware limited liability company, solely in its capacity as the Sellers' Representative**	10-Q	5/10/2018	2.2	
2.3	Agreement and Plan of Merger dated October 11, 2018 between Registrant and RP Newco XXVI Inc., a Delaware corporation and wholly-owned subsidiary of the Registrant, Rentlytics, Inc., a Delaware corporation, each of the equityholders of Rentlytics who executed the Agreement and Plan of Merger and Fortis Advisors LLC, a Delaware limited liability company, solely in its capacity as the Equityholders' Representative**	10-K	2/27/2019	2.3	
2.4	Agreement and Plan of Merger by and among the Registrant, RP Newco XXIX LLC, a Delaware limited liability company, Buildium, LLC, a Delaware limited liability company ("Buildium"), Sumeru Equity Partners Fund L.P., a Delaware limited partnership ("SEP"), K1 Private Investors, L.P., a Delaware limited partnership ("K1 PI"), K1 Private Investors (A), L.P., a Delaware limited partnership ("K1 PI(A)"), K1PI(A) and together with K1 PI, "K1"), and SEP, solely in its capacity as the Securityholders' Agent **				X
3.1	Amended and Restated Certificate of Incorporation of the Registrant, as amended	10-Q	8/6/2018	3.1	
3.2	Amended and Restated Bylaws of the Registrant	S-1/A	7/26/2010	3.4	
4.1	Form of Common Stock certificate of the Registrant	S-1/A	7/26/2010	4.1	
4.2	Shareholders' Agreement among the Registrant and certain stockholders, dated December 1, 1998, as amended July 16, 1999 and November 3, 2000	S-1	4/29/2010	4.2	
4.3	Second Amended and Restated Registration Rights Agreement among the Registrant and certain stockholders, dated February 22, 2008	S-1	4/29/2010	4.3	
4.4	Indenture between the Registrant and Wells Fargo Bank, National Association, dated May 23, 2017	10-Q	8/4/2017	4.4	
4.5	Form of Global Note to represent the 1.50% Convertible Senior Notes due 2022, of the Registrant	10-Q	8/4/2017	4.5	
4.6	Form of Warrant Confirmation in connection with 1.50% Convertible Senior Notes due 2022, of the Registrant	10-Q	8/4/2017	4.6	
4.7	Form of Call Option Confirmation in connection with 1.50% Convertible Senior Notes due 2022, of the Registrant	10-Q	8/4/2017	4.7	
4.8	Description of Registered Securities				X
10.1	Form of Indemnification Agreement entered into between the Registrant and each of its directors and officers	S-1	4/29/2010	10.1	
10.2	Amended and Restated 1998 Stock Incentive Plan (June 2010)+	S-1	6/7/2010	10.2G	

Exhibit Number	Exhibit Description	Incorporated by Reference Form	Date	Number	Included Herewith
10.3	Form of Stock Option Agreement approved for use under the 1998 Stock Incentive Plan+	S-1	4/29/2010	10.2A	
10.4	Forms of Stock Option Agreements and Restricted Share Agreements approved for use under the 1998 Stock Incentive Plan+	S-1	6/7/2010	10.2E, 10.2F, 10.2H	
10.5	2010 Equity Incentive Plan, as Amended and Restated June 4, 2014+	DEF-14A	4/17/2014	Appendix A	
10.6	First Amendment to the Amended and Restated 2010 Equity Incentive Plan+	8-K	1/21/2015	10.1	
10.7	Second Amendment to the Amended and Restated 2010 Equity Incentive Plan+	8-K	4/7/2015	10.1	
10.8	Third Amendment to the Amended and Restated 2010 Equity Incentive Plan+	10-Q	5/6/2016	10.1	
10.9	Fourth Amendment to the RealPage, Inc. 2010 Equity Incentive Plan, as amended and restated, dated February 16, 2017+	10-Q	5/8/2017	10.5	
10.10	Fifth Amendment to the RealPage, Inc. 2010 Equity Incentive Plan, as amended and restated, dated February 21, 2019+	10-Q	5/8/2019	10.5	
10.11	Forms of Stock Option Award Agreements and Restricted Stock Award Agreements approved for use under the 2010 Equity Incentive Plan+	S-8	8/17/2010	4.6, 4.7, 4.8, 4.9	
10.12	Form of Stock Option Award Agreement between the Registrant and Stephen T. Winn approved for use under the 2010 Equity Incentive Plan, as amended and restated June 4, 2014, as amended+	8-K	3/5/2015	10.1	
10.13	Form of Stock Option Award Agreement between the Registrant and certain executive officers approved for use under the 2010 Equity Incentive Plan, as amended and restated June 4, 2014, as amended+	8-K	3/5/2015	10.2	
10.14	Form of Restricted Stock Award Agreement for time-based awards between the Registrant and Stephen T. Winn approved for use under the 2010 Equity Incentive Plan, as amended and restated June 4, 2014, as amended+	8-K	3/5/2015	10.3	
10.15	Form of Restricted Stock Award Agreement for time-based awards between the Registrant and certain executive officers approved for use under the 2010 Equity Incentive Plan, as amended and restated June 4, 2014, as amended+	8-K	3/5/2015	10.4	
10.16	Form of Restricted Stock Award Agreement for time-based awards between the Registrant and certain executive officers approved for use under the 2010 Equity Incentive Plan, as amended and restated June 4, 2014, as amended+	10-Q	5/6/2016	10.4	
10.17	Form of Restricted Stock Award Agreement for market-based awards between the Registrant and certain executive officers approved for use under the 2010 Equity Incentive Plan, as amended and restated June 4, 2014, as amended+	10-Q	5/6/2016	10.5	
10.18	Form of Restricted Stock Award Agreement for market-based awards between the Registrant and Stephen T. Winn approved for use under the 2010 Equity Incentive Plan, as amended and restated June 4, 2014, as amended+	10-Q	5/6/2016	10.6	
10.19	Form of 2019 Management Incentive Plan+	10-Q	5/8/2019	10.6	
10.20	Amended and Restated Employment Agreement between the Registrant and Stephen T. Winn dated as of October 26, 2016+	8-K	10/31/2016	10.1	
10.21	Amended and Restated Employment Agreement between the Registrant and William Chaney dated as of March 1, 2015+	8-K	3/5/2015	10.1	

Exhibit Number	Exhibit Description	Incorporated by Reference Form	Date	Number	Included Herewith
10.22	Transition Agreement between the Registrant and William Chaney dated as of January 13, 2020+				X
10.23	Employment Agreement between the Registrant and David Monk, dated May 1, 2015+	10-Q	8/7/2015	10.18	
10.24	Employment Agreement between the Registrant and Ashley Glover, dated August 3, 2016+	10-Q	11/8/2016	10.2	
10.25	Exhibit I to the Employment Agreement between the Registrant and Ashley Glover referenced herein as Exhibit 10.24+	10-Q	5/6/2016	10.4	
10.26	Exhibit II to the Employment Agreement between the Registrant and Ashley Glover referenced herein as Exhibit 10.24+	10-Q	5/6/2016	10.5	
10.27	Transition Agreement between the Registrant and Andrew Blount dated December 31, 2019+				X
10.28	Employment Agreement between the Registrant and Thomas C. Ernst, Jr., dated January 7, 2019+	10-K	2/27/2019	10.33	
10.29	Exhibit I to the Employment Agreement between the Registrant and Thomas C. Ernst, Jr. referenced herein as Exhibit 10.28+	10-Q	5/6/2016	10.4	
10.30	Exhibit II to the Employment Agreement between the Registrant and Thomas C. Ernst Jr. referenced herein as Exhibit 10.28+	10-Q	5/6/2016	10.5	
10.31	Employment Agreement between the Registrant and Kandis Thompson, dated January 7, 2019+	10-K	2/27/2019	10.36	
10.32	Transition Agreement between the Registrant and Kandis Thompson dated as of December 29, 2019+				X
10.33	Employment Agreement between the Registrant and Brian Shelton, dated January 2, 2020+				X
10.34	Employment Agreement between the Registrant and Mike Britti, dated January 13, 2020+				X
10.35	Employment Agreement between the Registrant and Barry Carter, dated January 13, 2020+				X
10.36	Employment Agreement between the Registrant and Kurt Twining, dated March 1, 2015+				X
10.37	Lease Agreement dated June 2, 2015 by and between the Registrant and Lakeside Campus Partners, LP	8-K	6/4/2015	10.1	
10.38	First Amendment to the Lease Agreement dated July 27, 2015 by and between the Registrant and Lakeside Campus Partners, LP	10-Q	8/7/2015	10.20	
10.39	Second Amendment to the Lease Agreement dated July 8, 2016 by and between the Registrant and Lakeside Campus Partners, LP	10-Q	11/8/2016	10.1	
10.40	Amended and Restated Credit Agreement by and among the Registrant, the lenders from time to time party thereto and Wells Fargo Bank, National Association, as administrative agent, dated September 5, 2019	10-Q	11/8/2019	10.1	
10.41	Amended and Restated Guaranty Agreement by and among the Registrant and certain domestic subsidiaries of the Registrant in favor of Wells Fargo Bank, National Association, as administrative agent, dated September 5, 2019	10-Q	11/8/2019	10.2	
10.42	Amended and Restated Collateral Agreement by and among the Registrant and certain of its subsidiaries in favor of Wells Fargo Bank, National Association, as administrative agent, dated September 5, 2019	10-Q	11/8/2019	10.3	

Exhibit Number	Exhibit Description	Incorporated by Reference Form	Date	Number	Included Herewith
21.1	Subsidiaries of the Registrant				X
23.1	Consent of Ernst & Young LLP, Independent Registered Public Accounting Firm				X
31.1	Certification of Chief Executive Officer pursuant to Exchange Act Rules 13a-14(a) or 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002				X
31.2	Certification of Chief Financial Officer pursuant to Exchange Act Rules 13a-14(a) or 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002				X
32.1	Certification of Chief Executive Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002*				X
32.2	Certification of Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002*				X
101.INS	Instance				X
101.SCH	Taxonomy Extension Schema				X
101.CAL	Taxonomy Extension Calculation				X
101.LAB	Taxonomy Extension Labels				X
101.PRE	Taxonomy Extension Presentation				X
101.DEF	Taxonomy Extension Definition				X
104	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101)				X

+ Indicates management contract or compensatory plan or arrangement.

* Furnished herewith.

** Exhibits and schedules have been omitted pursuant to Item 601(b)(2) of Regulation S-K and will be furnished to the Securities and Exchange Commission upon request.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this Annual Report on Form 10-K to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Richardson, State of Texas, on this 2nd day of March, 2020.

REALPAGE, INC.

By: /s/ Stephen T. Winn

Stephen T. Winn

Chairman of the Board of Directors, Chief Executive Officer, President and Director

Pursuant to the requirements of the Securities Exchange Act of 1934, this Annual Report on Form 10-K has been signed by the following persons on behalf of the registrant and in the capacities and on the dates indicated:

Signature	Title	Date
/s/ Stephen T. Winn Stephen T. Winn	Chairman of the Board of Directors, Chief Executive Officer, President and Director (Principal Executive Officer)	March 2, 2020
/s/ Thomas C. Ernst, Jr. Thomas C. Ernst, Jr.	Executive Vice President, Chief Financial Officer and Treasurer (Principal Financial Officer)	March 2, 2020
/s/ Brian D. Shelton Brian D. Shelton	Senior Vice President, Chief Accounting Officer (Principal Accounting Officer)	March 2, 2020
/s/ Alfred R. Berkeley Alfred R. Berkeley	Director	March 2, 2020
/s/ Peter Gyenes Peter Gyenes	Director	March 2, 2020
/s/ Scott S. Ingraham Scott S. Ingraham	Director	March 2, 2020
/s/ Dana S. Jones Dana S. Jones	Director	March 2, 2020
/s/ Charles F. Kane Charles F. Kane	Director	March 2, 2020
/s/ Jeffrey T. Leeds Jeffrey T. Leeds	Director	March 2, 2020
/s/ Jason A. Wright Jason A. Wright	Director	March 2, 2020

BOARD OF DIRECTORS

Stephen T. Winn
Chairman & Chief Executive Officer

Alfred R. Berkeley III
Chairman
Princeton Capital Management, Inc.

Peter Gyenes
Former Non-Executive Chairman
Sophos Group PLC

Scott S. Ingraham
Principal
Zuma Capital

Dana S. Jones
CEO
Sparta Systems

Charles F. Kane
Adjunct Professor
MIT Sloan Graduate Business
School of Management

Jeffrey T. Leeds
President and Co-Founder
Leeds Equity Partners

Jason A. Wright
Partner
Apax Partners LLC

MANAGEMENT TEAM

Stephen T. Winn
Chairman & Chief Executive Officer

Thomas C. Ernst, Jr.
Executive Vice President
Chief Financial Officer & Treasurer

Ashley Glover
President

Michael A. Britti
Executive Vice President,
Mergers & Acquisitions
and Emerging Markets

David G. Monk
Executive Vice President
Chief Legal Officer & Secretary

Barry R. Carter
Senior Vice President
Chief Information Officer

Brian Shelton
Senior Vice President
Chief Accounting Officer

Kurt E. Twining
Senior Vice President
Chief People Officer

STOCKHOLDER INFORMATION

Information about RealPage, Inc. and a copy of this 2019 Annual Report can be found online at https://investor.realpage.com, and a copy of the 2019 Annual Report may be obtained from RealPage at no charge, by request to Investor Relations at our corporate office, by phone at 972-820-3773 or by email to ir@realpage.com.

RealPage has filed with the Securities and Exchange Commission the Chief Executive Officer and Chief Financial Officer certifications required by Sections 302 and 906 of the Sarbanes-Oxley Act of 2002 as exhibits to its Annual Report on Form 10-K for the fiscal year ended December 31, 2019.

Transfer Agent & Registrar
Computershare Trust Company, N.A.
462 South 4th Street
Suite 1600
Louisville, KY 40202

(800) 962-4284
https://www.computershare.com/us

Independent Registered Public Accounting Firm Ernst & Young LLP

Annual Stockholder Meeting
The meeting will be held via live webcast by visiting the following website:
www.meetingcenter.io/289622160
on June 3, 2020 at 10:00 AM CDT.

CORPORATE HEADQUARTERS

Headquarters
2201 Lakeside Blvd.
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NASDAQ Global Select Market
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This document contains certain “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995. These statements are based on our management’s current expectations and are subject to uncertainty and changes in circumstances. Actual results may differ materially from these expectations due to certain factors, including those set forth under the caption “Risk Factors” contained in the Form 10-K herein.

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