TWITTER, INC.
Form 10-K
February 21, 2019

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

(Mark One)

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

OR

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

Commission File Number 001-36164

Twitter, Inc.

(Exact name of registrant as specified in its charter)

Delaware	20-8913779
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

1355 Market Street, Suite 900

San Francisco, California 94103

(Address of principal executive offices and Zip Code)

(415) 222-9670

(Registrant's telephone number, including area code)

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

Title of each class	Name of each exchange on which registered
Common Stock, Par Value $0.000005 Per Share	New York Stock Exchange

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 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 fi les). YES NO

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

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, 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

The aggregate market value of the voting and non-voting common equity held by non-affiliates of the registrant, based on the closing price of a share of the registrant's common stock on June 30, 2018 as reported by the New York Stock Exchange on such date was approximately $31.2 billion.

The number of shares of the registrant's common stock outstanding as of February 7, 2019 was 766,824,550.

Portions of the registrant's Definitive Proxy Statement relating to the Annual Meeting of Stockholders are incorporated by reference into Part III of this Annual Report on Form 10-K where indicated. Such Definitive Proxy Statement will be filed with the Securities and Exchange Commission within 120 days after the end of the registrant's fiscal year ended December 31, 2018.

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SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K contains 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, which statements involve substantial risks and uncertainties. Forward-looking statements generally relate to future events or our future financial or operating performance. In some cases, you can identify forward-looking statements because they contain words such as “may,” “will,” “should,” “expects,” “plans,” “anticipates,” “could,” “intends,” “target,” “projects,” “believes,” “estimates,” “predicts,” “potential” or “continue” or the negative of these words or other similar terms or expressio that concern our expectations, strategy, plans or intentions. Forward-looking statements contained in this Annual Report on Form 10-K include, but are not limited to, statements about:

- our ability to attract and retain users and increase the level of engagement, including ad engagement, of our users and its impact on revenue;
- our plans regarding health and user safety, including our expectations regarding the impact on our reported metrics, policies, enforcement and preventing manipulation of our platform;
- our expectations regarding monetizable DAUs (mDAUs), MAUs, changes in cost per ad engagement and changes in ad engagements;
- our ability to develop or acquire new products, product features and services, improve our existing products and services, including with respect to Promoted Tweet product features, video and performance advertising, and increase the value of our products and services;
- our business strategies, plans and priorities, including our plans for growth and hiring, investment in our research and development efforts and our plans to scale capacity and enhance capability and reliability of our infrastructure, including capital expenditures relating to infrastructure;
- our ability to provide new content from third parties, including our ability to secure live streaming video content on terms that are acceptable to us;
- our ability to attract advertisers to our platforms, products and services and increase the amount that advertisers spend with us;
- our expectations regarding our user growth and growth rates and related opportunities as well as the continued usage of our mobile applications, including the impact of seasonality;
- our ability to increase our revenue and our revenue growth rate, including advertising and data licensing and other revenue;
- our ability to improve user monetization;
- our future financial performance, including trends in cost per ad engagement, revenue (including data licensing revenue), cost of revenue, operating expenses, including stock-based compensation and income taxes;
- our expectations regarding fluctuations in our tax expense and cash taxes;
- the impact of the General Data Protection Regulation (GDPR) and other data and privacy regulation;
- our expectations regarding outstanding litigation or the decisions of the courts;
- the effects of seasonal trends on our results of operations;
- the impact of our recent financial results on our valuation allowance for federal and state deferred tax assets;
- the sufficiency of our cash and cash equivalents, short-term investment balance and credit facility together with cash generated from operations to meet our working capital and capital expenditure requirements;
- our ability to timely and effectively develop, invest in, scale and adapt our existing technology and network infrastructure;
- our ability to successfully acquire and integrate companies and assets; and
- our expectations regarding international operations and foreign exchange gains and losses.

We caution you that the foregoing list may not contain all of the forward-looking statements made in this Annual Report on Form 10-K.

You should not rely upon forward-looking statements as predictions of future events. We have based the forward-looking statements contained in this Annual Report on Form 10-K primarily on our current expectations and projections about future events and trends that we believe may affect our business, financial condition, operating results, cash flows or prospects. The outcome of the events described in these forward-looking statements is subject to risks, uncertainties and other factors described in the section titled “Risk Factors” and elsewhere in this Annual Report on Form 10-K. Moreover, we operate in a very competitive and rapidly changing environment. New risks and uncertainties emerge from time to time and it is not possible for us to predict all risks and uncertainties that could have an impact on the forward-looking statements contained in this Annual Report on Form 10-K. We cannot assure you that the results, events and circumstances reflected in the forward-looking statements will be achieved or occur, and actual results, events or circumstances could differ materially from those described in the forward-looking statements.

The forward-looking statements made in this Annual Report on Form 10-K relate only to events as of the date on which the statements are made. We undertake no obligation to update any forward-looking statements made in this Annual Report on Form 10-K to reflect events or circumstances after the date of this Annual Report on Form 10-K or to reflect new information or the occurrence of unanticipated events, except as required by law. We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements and you should not place undue reliance on our forward-looking statements. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments we may make.

NOTE REGARDING KEY METRICS

We review a number of metrics, including monetizable daily active usage or users, or mDAUs, monthly active usage or users, or MAUs, changes in ad engagements and changes in cost per ad engagement, to evaluate our business, measure our performance, identify trends affecting our business, formulate business plans and make strategic decisions. See the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations—Key Metrics" for a discussion of how we calculate mDAUs, MAUs, changes in ad engagements and changes in cost per ad engagement.

We define monetizable daily active usage or users (mDAU) as Twitter users who logged in and accessed Twitter on any given day through Twitter.com or Twitter applications that are able to show ads. Our definition and calculation of mDAU is the same as that of the DAU data presented since the first quarter of 2016. The calculation of mDAU is not based on any standardized industry methodology and is not necessarily calculated in the same manner or comparable to similarly-titled measures presented by other companies. Average mDAU for a period represents the number of mDAU on each day of such period divided by the number of days for such period. Changes in mDAU are a measure of changes in the size of our daily logged in active user base. To calculate the year-over-year change in mDAU, we subtract the average mDAU for the three months ended in the previous year from the average mDAU for the same three months ended in the current year and divide the result by the average mDAU in the previous year.

We define monthly active usage or users (MAU) as Twitter users who logged in or were otherwise authenticated and accessed Twitter through our website, mobile website, desktop or mobile applications, SMS or registered third-party applications or websites in the 30-day period ending on the date of measurement. Average MAU for a period represent the average of the MAU at the end of each month during the period. We believe that mDAU, and its related growth, are the best ways to measure our success against our objectives and to show the size of our audience and engagement going forward, so we will discontinue disclosing MAU after the first quarter of 2019.

Certain metrics also include users that access Twitter through applications that automatically contact our servers for regular updates with no discernible user-initiated action involved, which we refer to as third-party auto-polling MAU. This activity causes our system to count MAUs associated with such applications as active users on the day or days such contact occurs. As of December 31, 2018, fewer than 8.5% of MAUs may have been third-party auto-polling MAU. Third-party auto-polling does not apply to mDAU as mDAU does not include users accessing Twitter through third-party applications.

The numbers of active users presented in this Annual Report on Form 10-K are based on internal company data. While these numbers are based on what we believe to be reasonable estimates for the applicable period of measurement, there are inherent challenges in measuring usage and user engagement across our large user base around the world. Furthermore, our metrics may be impacted by our information quality efforts, which are our overall efforts to reduce malicious activity on the service, inclusive of spam, malicious automation, and fake accounts. For example, there are a number of false or spam accounts in existence on our platform. We have performed an internal review of a sample of accounts and estimate that the average of false or spam accounts during the fourth quarter of 2018 represented fewer than 5% of our MAU and mDAU during the quarter. The false or spam accounts for a period represents the average of false or spam accounts in the samples during each monthly analysis period during the quarter. In making this determination, we applied significant judgment, so our estimation of false or spam accounts may not accurately represent the actual number of such accounts, and the actual number of false or spam accounts could be higher than we have estimated. We are continually seeking to improve our ability to estimate the total number of spam accounts and eliminate them from the calculation of our active users, and have made improvements in our spam detection capabilities that have resulted in the suspension of a large number of spam, malicious automation and fake accounts. We intend to continue to make such improvements. After we determine an account is spam, malicious automation or fake, we stop counting it in our MAU, mDAU, or related metrics. Additionally, we rely on third-party SMS aggregators and mobile carriers to deliver SMS messages to certain of our users when we send our SMS messages to such accounts. If, however, we are notified of material deliverability issues because of, for example, infrastructure issues at the service-provider level or governmental restrictions based on content, we do not include the affected users in MAUs. We also treat multiple accounts held by a single person or organization as multiple users for purposes of calculating our active users because we permit people and organizations to have more than one account. Additionally, some accounts used by organizations are used by many people within the organization. As such, the calculations of our active users may not accurately reflect the actual number of people or organizations using our platform.

In addition, our data regarding user geographic location for purposes of reporting the geographic location of our MAU and mDAU is based on the IP address or phone number associated with the account when a user initially registered the account on Twitter. The IP address or phone number may not always accurately reflect a user’s actual location at the time such user engaged with our platform. For example, a mobile user may appear to be accessing Twitter from the location of the proxy server that the user connects to rather than from a user’s actual location.

We regularly review and may adjust our processes for calculating our internal metrics to improve their accuracy. Our measures of user growth and user engagement may differ from estimates published by third parties or from similarly-titled metrics of our competitors due to differences in methodology.

Our total audience metrics are based on both internal metrics and data from Google Analytics, which measures logged-out visitors to our properties.

PART I

Item 1. BUSINESS

Overview

Twitter is what’s happening in the world and what people are talking about right now. From breaking news and entertainment, to sports, politics, and everyday interests, Twitter shows every side of the story. On Twitter you can join the open conversation and watch highlights, clips, or live-streaming events. Twitter is available in more than 40 languages around the world. The service can be accessed via twitter.com, an array of mobile devices via Twitter owned and operated mobile applications (e.g. Twitter for iPhone and Twitter for Android), and SMS.

In 2018, we took important steps to increase the collective health, openness, and civility of the public conversation on Twitter, helping people see high-quality information, strengthening our sign-up and account verification processes, and preventing the abuse of Twitter data. Specific actions we took in 2018 included: strengthening account security, updating our rules to more clearly address specific types of hateful conduct, taking new behavior-based signals into account when presenting and organizing Tweets, making it easier to see when a Tweet was removed for breaking our rules, and expanding our team through increased hiring and acquisition. In 2018, our machine learning efforts continued to improve, making it harder for malicious accounts to manipulate our service through multiple accounts and evading suspension, resulting in the suspension of millions of spammy and suspicious accounts. We also continued our work to make it easier to follow and discuss events as they are unfolding with expanded coverage of sports, entertainment, news, elections, and other topics and events.

Products and Services for Users

Our primary product, Twitter, is a global platform for public self-expression and conversation in real time. Twitter allows people to consume, create, distribute and discover content and has democratized content creation and distribution. Periscope is a mobile application that lets anyone broadcast and watch video live with others. Periscope broadcasts can also be viewed through Twitter and on desktop or mobile web browsers. We continue to implement live broadcasts across Twitter, including trends and moments, to help people discover what’s happening live.

The reach of Twitter content is not limited to our logged-in users on the Twitter platform, but rather extends to a much larger global audience. The public nature of the Twitter platform allows us and others to extend the reach of Twitter content beyond our properties. Over 1 million media outlets and our platform partners distribute Tweets beyond our properties to complement their content by making it more timely, relevant and comprehensive. These outlets and partners also add value to our user experience by contributing content to our platform. Many of the world’s most trusted media outlets and publishers regularly use Twitter as a platform for content distribution.

Products and Services for Advertisers

Our Promoted Products enable our advertisers to launch products and services and promote their brands, amplify their visibility and reach, and connect with our audience, while extending the conversation around their advertising campaigns. We enable our advertisers to target an audience based on a variety of factors, including a user’s interest graph. The interest graph maps, among other things, interests based on users followed and actions taken on our platform, such as Tweets created and engagement with Tweets. We believe a user’s interest graph produces a clear and real-time signal of a user’s interests, greatly enhancing the relevance of the ads we can display for users and enhancing our targeting capabilities for advertisers. Our Promoted Products are incorporated into our platform as native advertising and are designed to be as compelling and useful to our users as organic content on our platform.

Currently, our Promoted Products consist of:

- Promoted Tweets. Promoted Tweets appear within a user's timeline, search results or profile pages just like an ordinary Tweet regardless of device. Promoted Tweets often include images and videos, such as App Cards and Website Cards. Using our proprietary algorithm and understanding of each user's interest graph, we can deliver Promoted Tweets that are intended to be relevant to a particular user. Our goal is to enable advertisers to create and optimize successful marketing campaigns — and pay either on impressions delivered or pay only for the user actions that are aligned with their marketing objectives. As a result, we have added product features to Promoted Tweets based on advertiser objectives, which may include Tweet engagements (e.g., retweets, replies and likes), website clicks or conversions, mobile application installs or engagements, obtaining new followers, or video views.
- Promoted Accounts. Promoted Accounts appear in the same format and place as accounts suggested by our Who to Follow recommendation engine, or in some cases, in Tweets in a user's timeline. Promoted Accounts provide a way for our advertisers to grow a community of users who are interested in their business, products or services.
- Promoted Trends. Promoted Trends appear at the top of the list of trending topics or timeline for an entire day in a particular country or on a global basis. When a user clicks on a Promoted Trend, search results for that trend are shown in a timeline and a Promoted Tweet created by our advertisers is displayed to the user at the top of those search results. We feature one Promoted Trend per day per geography.

Advertisers can also run short video ads, such as In-Stream video ads, either before or around premium video content, such as during live premium video content from publishing partners or clips from a variety of interest categories such as news, sports and entertainment. Our technology dynamically inserts those advertisers' ads into the relevant videos and delivers the ads to the audience targeted by those advertisers. We may pay content partners a portion of our advertising revenue for the right to use and distribute their content on our platform. In addition, In-Stream Video Sponsorships allow advertisers to build brand association by sponsoring premium video content from a single publishing partner, including live video, video clips, and other storytelling formats like Sponsored Moments.

We continue to focus our investment in features that differentiate Twitter and capitalize on our value proposition for advertisers, including video and more organic ad formats such as Video Website Card.

Our technology platform and information database enable us to provide targeting capabilities based on audience attributes like geography, interests, keyword, television conversation, content, and events that make it possible for advertisers to promote their brands, products and services, amplify their visibility and reach, and complement and extend the conversation around their advertising campaigns.

Our platform also enables customers to advertise across the mobile ecosystem, both on Twitter's owned and operated properties as well as off Twitter on third-party publishers' websites, applications and other offerings, across the full user lifecycle — from acquiring new users to engaging existing users. We enable advertisers to extend their reach beyond Twitter through:

- MoPub, our mobile-focused advertising exchange, which combines ad serving, ad network mediation and a real-time bidding exchange into one comprehensive monetization platform.
- Twitter Audience Platform, an advertising offering that enables advertisers to extend their advertising campaigns with Twitter Promoted Products to audiences off Twitter while retaining access to Twitter's measurement, targeting and creative tools.

Content Partnerships

Video is an important way to stay informed on Twitter, enabling users and content owners to better share experiences, engage in events, and converse with broader audiences. We continue to increase reach and engagement for content owners around the world through live-streaming, highlight video clips, and video-on-demand agreements signed to complement the user generated and licensed live and on-demand video content already available on Twitter across a number of verticals including sports, news, and entertainment.

Products for Developers and Data Partners

We provide a set of tools, public APIs and embeddable widgets that developers can use to contribute their content to our platform, syndicate and distribute Twitter content across their properties and enhance their websites and applications with Twitter content. Websites and applications integrating with Twitter add value to our user experience. Many applications have been registered by developers to enable them to integrate with our platform, and leverage Twitter content to enhance and extend their applications in new and creative ways. The goal of our platform product development is to make it easy for developers to integrate seamlessly with Twitter, while keeping this process safer and more secure for Twitter users.

We also offer subscription access to our public data feed for partners who wish to access data beyond our public API, which offers a limited amount of our public data for free. Our enterprise data products and services offer more sophisticated data sets and better data enrichments to allow developers and businesses to utilize our public content to derive business insights and build products using the unique content that is shared on Twitter. We have grown our data licensing revenue with a more customer-centric approach to channels, markets, products, and pricing. We believe this approach positions both Twitter and our key channel partners for greater growth and monetization, and we are investing in deeper partnerships with a few select solution providers to help businesses and organizations realize greater value from our data and platform.

Competition

Our business is characterized by rapid technological change, frequent product innovation and continuously evolving user, advertiser, content partner, platform partner and developer preferences and expectations. We face significant competition in every aspect of our business, including from companies that provide tools to facilitate communications and the sharing of information, companies that enable marketers to display advertising, and other online ad networks, exchanges and platforms. We also compete to attract, engage, and retain people who use our products, to attract and retain marketers, and to attract and retain developers to build compelling mobile and web applications that integrate with our products. We have seen escalating competition for digital ad spending and expect this trend to continue. We also compete to attract and retain employees, especially software engineers, designers, and product managers.

We compete with the following companies for users' attention and for advertisers' budgets:

- Companies that offer products that enable everyone to create and share ideas, videos, and other content and information. These offerings include, for example, Facebook (including Instagram and WhatsApp) and Alphabet (including Google and YouTube), Microsoft (including LinkedIn), Snap, TikTok, and Verizon Media Group, as well as largely regional social media and messaging companies that have strong positions in particular countries (including WeChat, Kakao, and Line). Although we often seek differentiated content from other licensors, we face competition for live premium video content rights from other digital distributors and traditional television providers, which may limit our ability to secure such content on economic and other terms that are acceptable to us in the future.
- Companies that offer advertising inventory and opportunities to advertisers.
- Companies that develop applications, particularly mobile applications, that create, syndicate and distribute content across internet properties.
- Traditional, online, and mobile businesses that enable users to consume content or marketers to reach their audiences and/or develop tools and systems for managing and optimizing advertising campaigns.

As we introduce new products, as our existing products evolve, or as other companies introduce new products and services, we may become subject to additional competition.

Our industry is evolving rapidly and is becoming increasingly competitive. See the sections titled “Risk Factors—If we are unable to compete effectively for users and advertiser spend, our business and operating results could be harmed” and “Risk Factors—We depend on highly skilled personnel to grow and operate our business, and if we are unable to hire, retain and motivate our personnel, we may not be able to grow effectively.”

Technology, Research and Development

Twitter is composed of a set of core, scalable and distributed services that are built from proprietary and open source technologies. These systems are capable of delivering billions of messages, including images and video, to hundreds of millions of people a day in an efficient and reliable way. We continue to invest in our existing products and services as well as develop new products and services through research and product development. We also continue to invest in protecting the safety, security and integrity of our platform by investing in both people and technology, including machine learning.

Sales and Marketing

We have a global sales force and sales support staff that is focused on attracting and retaining advertisers while certain advertisers use our self-serve advertising platform to launch and manage their advertising campaigns. Our sales force and sales support staff assist advertisers throughout the advertising campaign cycle, from pre-purchase decision making to real-time optimizations as they utilize our campaign management tools, and to post-campaign analytics reports to assess the effectiveness of their advertising campaigns.

Since our inception, our user base has grown primarily organically, complemented with targeted campaigns to drive new user acquisition. In 2018, we set out to clearly define who we are and express the uniqueness and power of our brand through marketing campaigns to drive awareness of Twitter's unique positioning. We also solidified our value proposition for advertisers with our "Start With Them" campaign, which highlights that Twitter connects advertisers with the most valuable audiences when they are most receptive.

Intellectual Property

We seek to protect our intellectual property rights by relying on federal, state and common law rights in the United States and other countries, as well as contractual restrictions. We generally enter into confidentiality and invention assignment agreements with our employees and contractors, and confidentiality agreements with other third parties, in order to limit access to, and disclosure and use of, our confidential information and proprietary technology. In addition to these contractual arrangements, we also rely on a combination of trademarks, trade dress, domain names, copyrights, trade secrets and patents to help protect our brand and our other intellectual property.

In May 2013, we implemented our Innovator's Patent Agreement, or IPA, which we enter into with our employees and consultants, including our founders. The IPA which applies to our current and future patents, allows us to assert our patents defensively. The IPA also allows us to assert our patents offensively with the permission of the inventors of the applicable patent. The IPA can limit our ability to prevent infringement of our patents. See the section titled "Risk Factors—Our intellectual property rights are valuable, and any inability to protect them could reduce the value of our products, services and brand" for a further discussion of the IPA.

Government Regulation

We are subject to a number of U.S. federal and state and foreign laws and regulations that involve matters central to our business. These laws and regulations may involve privacy, rights of publicity, data protection, content regulation, intellectual property, competition, protection of minors, consumer protection, taxation or other subjects. Many of these laws and regulations are still evolving and being tested in courts and could be interpreted in ways that could harm our business. In addition, the application and interpretation of these laws and regulations often are uncertain, particularly in the new and rapidly evolving industry in which we operate.

We are also subject to federal, state and foreign laws regarding privacy and the protection of user data. Foreign data protection, privacy, consumer protection, content regulation and other laws and regulations are often more restrictive than those in the United States. For example, the General Data Protection Regulation, or the GDPR, which was effective from May 2018. The GDPR also includes more stringent operational requirements for entities processing personal information and significant penalties for non-compliance. There are also a number of legislative proposals pending before the U.S. Congress, various state legislative bodies and foreign governments concerning content regulation and data protection that could affect us, including the California Consumer Privacy Act.

In March 2011, to resolve an investigation into various incidents, we entered into a settlement agreement with the Federal Trade Commission, or FTC, that, among other things, requires us to establish an information security program designed to protect non-public consumer information and also requires that we obtain biennial independent security assessments. The FTC investigation was the result of two separate incidents in which unauthorized intruders obtained administrative passwords of certain Twitter employees. In one of the incidents, the intruder accessed the employee's administrative capabilities to fraudulently reset various user passwords and post unauthorized Tweets. The obligations under the settlement agreement remain in effect until the later of March 2, 2031, or the date 20 years after the date, if any, on which the U.S. government or the FTC files a complaint in federal court alleging any violation of the order. Violation of existing or future regulatory orders, settlements, or consent decrees could subject us to substantial monetary fines and other penalties that could negatively affect our financial condition and results of operations.

Twitter users may be restricted from accessing Twitter from certain countries, and other countries have intermittently restricted access to Twitter. For example, Twitter is not directly accessible in China and has been blocked in the past in Turkey. It is possible that other governments may seek to restrict access to or block our website or mobile applications, censor content available through our products or impose other restrictions that may affect the accessibility or usability of Twitter for an extended period of time or indefinitely. For instance, some countries have enacted laws that allow websites to be blocked for hosting certain types of content.

For additional information, see the section titled "Risk Factors—Our business is subject to complex and evolving U.S. and foreign laws and regulations. These laws and regulations are subject to change and uncertain interpretation, and could result in claims, changes to our business practices, monetary penalties, increased cost of operations or declines in user growth, user engagement or ad engagement, or otherwise harm our business."

Seasonality

Advertising spending is traditionally strongest in the fourth quarter of each year. Historically, this seasonality in advertising spending has affected our quarterly results, with higher sequential advertising revenue growth from the third quarter to the fourth quarter compared to sequential advertising revenue from the fourth quarter to the subsequent first quarter.

Backlog

As of December 31, 2018, our backlog primarily consists of long-term data licensing contracts. We generate the substantial majority of our revenue from our advertising services. As such, we do not believe that our backlog, as of any particular date, is necessarily indicative of actual revenue for any future period. Refer to Note 3 of the Notes to Consolidated Financial Statements under Part II, Item 8 of this Annual Report on Form 10-K regarding the amount of remaining performance obligations, which represents the significant majority of our contracted backlog.

Employees

As of December 31, 2018, we had 3,920 full-time employees.

Corporate Information

We were incorporated in Delaware in April 2007. Our principal executive offices are located at 1355 Market Street, Suite 900, San Francisco, California 94103, and our telephone number is (415) 222-9670. We completed our initial public offering in November 2013 and our common stock is listed on the New York Stock Exchange under the symbol "TWTR." Unless the context requires otherwise, the words "Twitter," "we," "Company," "us" and "our" refer to Twitter, Inc. a our wholly owned subsidiaries.

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Available Information

Our website is located at www.twitter.com, and our investor relations website is located at http://investor.twitterinc.com/. Copies of our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and amendments to these reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, or the Exchange Act, are available, free of charge, on our investor relations website as soon as reasonably practicable after we file such material electronically with or furnish it to the Securities and Exchange Commission, or the SEC. The SEC also maintains a website that contains our SEC filings. The address of the site is www.sec.gov.

We webcast our earnings calls and certain events we participate in or host with members of the investment community on our investor relations website. Additionally, we provide notifications of news or announcements regarding our financial performance, including SEC filings, investor events, press and earnings releases, and blogs as part of our investor relations website. We have used, and intend to continue to use, our investor relations website, as well as certain Twitter accounts (@jack, @nedsegal, @twitter and @twitterIR), as means of disclosing material non-public information and for complying with our disclosure obligations under Regulation FD. Further corporate governance information, including our certificate of incorporation, bylaws, corporate governance guidelines, board committee charters, and code of business conduct and ethics, is also available on our investor relations website under the heading "Corporate governance." The contents of our websites are not intended to be incorporated by reference into this Annual Report on Form 10-K or in any other report or document we file with the SEC, and any references to our websites are intended to be inactive textual references only.

Item 1A. RISK FACTORS

Investing in our common stock involves a high degree of risk. You should carefully consider the risks and uncertainties described below, together with all of the other information in this Annual Report on Form 10-K, including the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our consolidated financial statements and related notes, before making a decision to invest in our common stock. The risks and uncertainties described below may not be the only ones we face. If any of the risks actually occurs, our business, financial condition, operating results, cash flows and prospects could be materially and adversely affected. In that event, the market price of our common stock could decline, and you could lose part or all of your investment.

Risks Related to Our Business and Our Industry

If we fail to increase our mDAUs, ad engagement or other general engagement on our platform, our revenue, business and operating results may be harmed.

The size of our mDAUs and those daily users' level of engagement with advertising are critical to our success. mDAUs for the three months ended December 31, 2018 were 126 million, an increase of 9% year-over-year. Our long-term financial performance will continue to be significantly determined by our success in increasing the growth rate of our mDAUs as well as the number of ad engagements. Our mDAU growth rate has fluctuated over time, and it may slow or decline. To the extent our mDAU growth rate slows or the absolute number of mDAU declines, our revenue growth will become dependent on our ability to increase levels of user engagement on Twitter and increase revenue growth from third-party publishers' websites and applications, data licensing and other offerings. To the extent our mDAU growth rate slows, our success will become increasingly dependent on our ability to increase levels of ad engagement on Twitter. We generate a substantial majority of our revenue based upon engagement by our users with the ads that we display. If people do not perceive our products and services to be useful, reliable and trustworthy, we may not be able to attract users or increase the frequency of their engagement with our platform and the ads that we display. A number of factors could potentially negatively affect user growth and engagement, including if:

- users, including influential users, such as world leaders, government officials, celebrities, athletes, journalists, sports teams, media outlets and brands or certain age demographics, engage with other products, services or activities as an alternative to ours;
- we are unable to convince potential or new users of the value and usefulness of our products and services;
- there is a decrease in the perceived quantity, quality, usefulness or relevance of the content generated by our users or content partners;
- there could also be a perception that actions we take to better foster a healthy conversation or to improve relevancy on the platform negatively impact the content or ranking of content posted by certain users;

- our content partners terminate their relationships with us or do not renew their agreements on economic or other terms that are favorable to us;
- there are user concerns related to privacy and communication, safety, security, spam, manipulation or other hostile or inappropriate usage or other factors, or our health efforts result in the removal of certain accounts;
- we fail to introduce new and improved products or services or if we introduce new or improved products or services that are not favorably received or that negatively affect user engagement;
- technical or other problems prevent us from delivering our products or services in a rapid and reliable manner or otherwise affect the user experience, including issues with connecting to the Internet;
- users have difficulty installing, updating, or otherwise accessing our products or services on mobile devices as a result of actions by us or third parties that we rely on to distribute our products and deliver our services;
- we are unable to manage and prioritize information to ensure users are presented with content that is interesting, useful and relevant to them;
- users believe that their experience is diminished as a result of the decisions we make with respect to the frequency, format, relevance and prominence of ads or other content that we display;
- changes in our products or services that are mandated by, or that we elect to make to address, laws (such as the General Data Protection Regulation, or the GDPR) or legislation, inquiries from legislative bodies, regulatory authorities or litigation (including settlements or consent decrees) adversely affect our products or users;
- we fail to provide adequate customer service to users; or
- we do not maintain our brand image or our reputation is damaged.

We believe that meaningful improvement in audience growth rate and engagement is dependent on improving our product and feature offerings to demonstrate our value proposition to a larger audience. If we are unable to increase our user base, user growth rate or user engagement, or if these metrics decline, our products and services could be less attractive to potential or new users, as well as to advertisers, content partners and platform partners, which would have a material and adverse impact on our business, financial condition and operating results.

If the people who use our service or our content partners do not continue to contribute content or such content is not viewed as unique or engaging by other users, we may experience a decline in users accessing our products and services and their engagement, which could result in the loss of content partners, advertisers, platform partners, and revenue.

Our success depends on our ability to provide users of our products and services with unique and engaging content, which in turn depends on the content contributed by our users. We believe that one of our competitive advantages is the quality, quantity and real-time nature of the content on Twitter, and that access to unique or real-time content is one of the main reasons users visit Twitter. We seek to foster a broad and engaged user community, and we encourage world leaders, government officials, celebrities, athletes, journalists, sports teams, media outlets and brands to use our products and services to express their views to broad audiences. We also encourage media outlets to use our products and services to distribute their content. In addition, we license our premium live streaming video content from a variety of content providers. If these content providers are no longer willing or able to license us content upon economic and other terms that are acceptable to us, our ability to stream such content will be adversely affected and/or our costs could increase. If users, including influential users, do not continue to contribute content or content providers do not license content to Twitter, and we are unable to provide users with unique, engaging and timely content, our user base and engagement may decline. Additionally, if we are not able to address user concerns regarding the safety and security of our products and services or if we are unable to successfully prevent or mitigate spammy, abusive or other disruptive or detracting behavior on our platform, the size of our engaged user base may decline. We rely on the sale of advertising services for the substantial majority of our revenue. We believe advertisers come to Twitter because we have one of the most valuable audiences when they are most receptive, and we generate a high return on investment against their campaign objectives whether they are launching a new product or connecting with what's happening on Twitter. However, a decline in the number of users, user growth rate, or user engagement, including as a result of the loss of world leaders, government officials, celebrities, athletes, journalists, sports teams, media outlets and brands who generate content on Twitter, may deter advertisers from using our products or services or cause current advertisers to reduce their spending with us or cease doing business with us, which would harm our business and operating results.

We generate the substantial majority of our revenue from advertising. The loss of advertising revenue could harm our business.

The substantial majority of our revenue is currently generated from third parties advertising on Twitter. We generated approximately 86% of our revenue from advertising in each of the years ended December 31, 2017 and 2018. We generate substantially all of our advertising revenue through the sale of our Promoted Products: Promoted Tweets, Promoted Accounts and Promoted Trends. As is common in our industry, our advertisers do not have long-term advertising commitments with us. In addition, many of our advertisers purchase our advertising services through one of several large advertising agency holding companies. To sustain or increase our revenue, we must add new advertisers and encourage existing advertisers to maintain or increase the amount of advertising inventory purchased through our platform and adopt new features and functionalities that we add to our platform. However, advertising agencies and potential new advertisers may view our Promoted Products or any new products or services we offer as experimental and unproven, and we may need to devote additional time and resources to educate them about our products and services. Advertisers also may choose to reach users through our free products and services, instead of our Promoted Products. Advertisers will not continue to do business with us, or they will reduce the prices they are willing to pay to advertise with us, if we do not deliver ads in an effective manner, or if they do not believe that their investment in advertising with us will generate a competitive return on investment relative to alternatives, including online, mobile and traditional advertising platforms. In addition, competition for advertising is becoming increasingly more intense and our advertising revenue could be further impacted by escalating competition for digital ad spending as well as the re-evaluation of our revenue product feature portfolio, which could result in the de-emphasis of certain product features. Our revenue growth is primarily driven by increases in the number of our mDAUs, increases in ad pricing or number of ads shown driven by strong advertiser demand, increases in our clickthrough rate, as well as other factors. To date, our available advertising inventory has been greater than demand. Our future revenue growth, however, may be limited by available advertising inventory for specific ad types on certain days if we do not increase our mDAU or monetize our larger global audience. Our advertising revenue also could be adversely affected by a number of other factors, including:

- decreases in user engagement with the ads on our platform and those that we serve off of our platform;
- decreases in the size of our mDAUs or the growth rate of mDAUs;
- if we are unable to demonstrate the value of our Promoted Products to advertisers and advertising agencies or if we are unable to measure the value of our Promoted Products in a manner which advertisers and advertising agencies find useful or reliable;
- if we are perceived as not safe for brand advertisers;
- if we are unable to demonstrate the value of, or attract video and video advertisements to, our platform;
- decreases in the perceived quantity, quality, usefulness or relevance of our users or the content generated by our users or content partners;
- if our Promoted Products are not cost effective or not valued by certain types of advertisers or if we are unable to develop cost effective or valuable advertising services for different types of advertisers;
- if we are unable to convince advertisers and brands to invest resources in learning to use our products and services and maintaining a brand presence on Twitter;
- our advertisers’ ability to optimize their campaigns or effectively and reliably measure the results of their campaigns;
- product or service changes we may make that change the frequency or relative prominence of ads displayed on Twitter or that detrimentally impact revenue in the near term with the goal of achieving long -term benefits;
- our inability to increase advertiser demand and spend from new and existing advertisers as well as advertising inventory;
- our inability to increase the relevance of ads shown to users;
- our inability to help advertisers effectively target ads, including as a result of the fact that we do not collect extensive personal information from our users and that we do not have real-time geographic information for all of our users particularly for ads served through our app mobile-focused advertising exchange;

- decreases in the cost per ad engagement;
- failure to effectively monetize our growing international user base, our logged-out audience or our syndicated audience;

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- loss of advertising market share to our competitors;
- the degree to which users access Twitter content through applications that do not contain our ads;
- any arrangements or other partnerships with third parties to share our revenue;
- if our new advertising strategies do not gain traction;
- the impact of new technologies that could block or obscure the display of our ads;
- adverse legal developments relating to advertising or measurement tools related to our metrics or the effectiveness of advertising, including legislative and regulatory developments, such as GDPR and other privacy regulations, and developments in litigation;
- our inability to create new products, product features and services that sustain or increase the value of our advertising services to both our advertisers and our users;
- changes to our products or development of new products or product features that decrease users' ad engagements or limit the types of user interactions that we count as ad engagements;
- the impact of fraudulent clicks or spam on our Promoted Products and our users;
- changes in the way our advertising is priced; and
- the impact of macroeconomic conditions and conditions in the advertising industry in general.

The occurrence of any of these or other factors could result in a reduction in demand for our ads, which may reduce the prices we receive for our ads, either of which would negatively affect our revenue and operating results.

If we are unable to compete effectively for users and advertiser spend, our business and operating results could be harmed.

Competition for users of our products and services is intense. Although we have developed a global platform that we believe is the best and fastest place to see what's happening and what people are talking about all around the world, we face strong competition in our business. We compete against many companies to attract and engage users every day, including companies which have greater financial resources and substantially larger user bases, such as Facebook (including Instagram and WhatsApp), Alphabet (including Google and YouTube), Microsoft (including LinkedIn), Snap, TikTok, and Verizon Media Group, which offer a variety of Internet and mobile device-based products, services and content. For example, Facebook operates a social networking site with significantly more users than Twitter and has been introducing features similar to those of Twitter. In addition, Alphabet may use its strong position in one or more markets to gain a competitive advantage over us in areas in which we operate, including by integrating competing features into products or services they control. As a result, our competitors may draw users towards their products or services and away from ours. This could decrease the growth or engagement of our user base, which, in turn, would negatively affect our business. We also compete against largely regional social media and messaging companies that have strong positions in particular countries such as WeChat, Kakao and Line.

We believe that our ability to compete effectively for users depends upon many factors both within and beyond our control, including:

- the popularity, usefulness, ease of use, performance and reliability of our products and services compared to those of our competitors;
- the amount, quality and timeliness of content generated by our users and content partners;
- the timing and market acceptance of our products and services;
- our ability, in and of itself, and in comparison to the ability of our competitors, to develop new products and services and enhancements to existing products and services;
- the frequency and relative prominence of the ads displayed by us or our competitors;
- our ability to establish and maintain relationships with content partners;
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our ability to develop a reliable, scalable, secure, high-performance technology infrastructure that can efficiently handle increased usage globally;

- changes mandated by, or that we elect to make to address, legislation, regulatory authorities or litigation, including settlements, consent decrees and the GDPR, some of which may have a disproportionate effect on us;
- the application of antitrust laws both in the United States and internationally;
- the continued adoption of our products and services internationally;
- our ability to establish and maintain relationships with platform partners that integrate with our platform;
- acquisitions or consolidation within our industry, which may result in more formidable competitors; and
- our reputation and brand strength relative to our competitors.

We also face significant competition for advertiser spend. The substantial majority of our revenue is currently generated through third parties advertising on Twitter, and we compete against online and mobile businesses, including those referenced above, and traditional media outlets, such as television, radio and print, for advertising budgets. In addition, many advertisers, particularly branded advertisers, use marketing mix analyses to determine how to allocate their advertising budgets on an annual or bi-annual basis. Accordingly, if we fail to demonstrate to such advertisers during the appropriate time period that we provide a better return on investment than our competitors do, we may lose the opportunity to secure, increase or sustain our share of the advertising budget allocated for a significant portion of the year until the next budget cycle.

We also compete with advertising networks, exchanges, demand side platforms and other platforms, such as Google AdSense, DoubleClick Ad Exchange, Nexage and Brightroll Ad Exchanges, Verizon Media Group, and Microsoft Media Network, for marketing budgets and in the development of the tools and systems for managing and optimizing advertising campaigns. In order to grow our revenue and improve our operating results, we must increase our share of spending on advertising relative to our competitors, many of which are larger companies that offer more traditional and widely accepted advertising products. In addition, some of our larger competitors have substantially broader product or service offerings and leverage their relationships based on other products or services to gain additional share of advertising budgets.

We believe that our ability to compete effectively for advertiser spend depends upon many factors both within and beyond our control, including:

- the size and composition of our user base relative to those of our competitors;
- our ad targeting and measurement capabilities, and those of our competitors;
- the timing and market acceptance of our advertising services, and those of our competitors;
- our marketing and selling efforts, and those of our competitors;
- the pricing of our advertising products and services relative to those of our competitors;
- the actual or perceived return our advertisers receive from our advertising services, and those of our competitors; and
- our reputation and the strength of our brand relative to our competitors.

In recent years, there have been significant acquisitions and consolidation by and among our actual and potential competitors. We anticipate this trend of consolidation will continue, which will present heightened competitive challenges for our business. Acquisitions by our competitors may result in reduced functionality of our products and services. For example, following Facebook’s acquisition of Instagram, Facebook disabled Instagram’s photo integration with Twitter such that Instagram photos were no longer viewable within Tweets and users are instead re-directed to Instagram to view Instagram photos through a link within a Tweet. As a result, our users may be less likely to click on links to Instagram photos in Tweets, and Instagram users may be less likely to Tweet or remain active users of Twitter. Any similar elimination of integration with Twitter in the future, whether by Facebook or others, may adversely impact our business and operating results.

Consolidation may also enable our larger competitors to offer bundled or integrated products that feature alternatives to our platform. Reduced functionality of our products and services, or our competitors' ability to offer bundled or integrated products that compete directly with us, may cause our users, user growth rate, and ad engagement to decline and advertisers to reduce their spend with us.

If we are not able to compete effectively for users and advertiser spend our business and operating results would be materially and adversely affected.

Our priority as a company is to improve the health of the public conversation on Twitter. Focusing our efforts on this priority may negatively impact our business operations in the short term.

We believe that our long-term success depends on our ability to improve the health of the public conversation on Twitter. We have made this our priority and have focused our efforts on improving the quality of that conversation, including by devoting substantial internal resources to our strategy. These efforts include the reduction of abuse, harassment, spam, manipulation and malicious automation on the platform, as well as a focus on improving information quality and the health of conversation on Twitter. For example, we recently announced that we were removing certain locked accounts from follower counts across profiles globally. While that specific change did not affect our previously-disclosed MAU or DAU metrics, some of the health initiatives that we have implemented as part of our ongoing commitment to a healthy public conversation have negatively impacted, and may in the future negatively impact, our publicly reported metrics in a few ways. First, our health efforts include the removal of accounts pursuant to our terms and services that are abusive, spammy, fake or malicious, and these accounts may be monthly active or daily active users, as well as actions taken to detect and challenge potentially automated, spammy, or malicious accounts during the sign-up process. For example, in the third and fourth quarters of 2018, year-over-year average mDAU growth was impacted by ongoing health efforts, both due to how we resourced and prioritized our work and the impact from ongoing success removing spammy and suspicious accounts. Second, we are also making active decisions to prioritize health related initiatives over other near-term product improvements that may drive more usage of Twitter as a daily utility. These decisions may not be consistent with the short-term expectations of our advertising customers or investors and may not produce the long-term benefits that we expect, in which case our user growth and user engagement, our relationships with advertisers and our business and operating results could be harmed.

Our operating results may fluctuate from quarter to quarter, which makes them difficult to predict.

Our quarterly operating results have fluctuated in the past and will fluctuate in the future. As a result, our past quarterly operating results are not necessarily indicators of future performance. Our operating results in any given quarter can be influenced by numerous factors, many of which we are unable to predict or are outside of our control, including:

- our ability to provide something valuable to people on Twitter every day and grow our mDAU;
- our ability to attract and retain advertisers, content partners and platform partners;
- the occurrence of planned significant events, such as the World Cup, Super Bowl, Champions League Final, World Series, Olympics and the Oscars, or unplanned significant events, such as natural disasters and political revolutions;
- the pricing of our products and services;
- the development and introduction of new products or services, changes in features of existing products or services or de-emphasis or termination of existing products, product features or services;
- the impact of competitors or competitive products and services;
- our ability to maintain or increase revenue;
- our ability to maintain or improve gross margins and operating margins;
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increases in research and development, marketing and sales and other operating expenses that we may incur to grow and expand our operations and to remain competitive;

- stock-based compensation expense;
- costs related to the acquisition of businesses, talent, technologies or intellectual property, including potentially significant amortization costs;
- system failures resulting in the inaccessibility of our products and services;

- breaches of security or privacy, and the costs associated with remediating any such breaches;
- adverse litigation judgments, settlements or other litigation-related costs, and the fees associated with investigating and defending claims;
- changes in the legislative or regulatory environment, including with respect to security, tax, privacy, data protection, or content, or enforcement by government regulators, including fines, orders or consent decrees;
- changes in reserves or other non-cash credits or charges, such as releases of deferred tax asset valuation allowances, impairment charges or purchase accounting adjustments;
- changes in our expected estimated useful life of property and equipment and intangible assets;
- fluctuations in currency exchange rates and changes in the proportion of our revenue and expenses denominated in foreign currencies;
- changes in U.S. generally accepted accounting principles; and
- changes in global business or macroeconomic conditions.

Given our limited operating history and the rapidly evolving markets in which we compete, our historical operating results may not be useful to you in predicting our future operating results. If our revenue growth rate slows, we expect that the seasonality in our business may become more pronounced and may in the future cause our operating results to fluctuate. For example, advertising spending is traditionally seasonally strong in the fourth quarter of each year and we believe that this seasonality affects our quarterly results, which generally reflect higher sequential advertising revenue growth from the third to fourth quarter compared to sequential advertising revenue growth from the fourth quarter to the subsequent first quarter. In addition, global economic concerns continue to create uncertainty and unpredictability and add risk to our future outlook. An economic downturn in any particular region in which we do business or globally could result in reductions in advertising revenue, as our advertisers reduce their advertising budgets, and other adverse effects that could harm our operating results.

We depend on highly skilled personnel to grow and operate our business, and have seen high levels of attrition. If we are unable to hire, retain and motivate our personnel, we may not be able to grow effectively.

Our future success and strategy will depend upon our continued ability to identify, hire, develop, motivate and retain highly skilled personnel, including senior management, engineers, designers and product managers. We depend on contributions from our employees, and in particular our senior management team, to execute efficiently and effectively. We do not have employment agreements other than offer letters with any member of our senior management or other key employee, and we do not maintain key person life insurance for any employee. We also face significant competition for employees, particularly in the San Francisco Bay Area (where our headquarters is located) and other key markets, for engineers, designers and product managers from other Internet and high-growth companies, which include both publicly-traded and privately-held companies. As a result, we may not be able to retain our existing employees or hire new employees quickly enough to meet our needs. From time to time, we have also experienced high voluntary attrition, and in those times, the resulting influx of new leaders and other employees has required us to expend time, attention and resources to recruit and retain talent, restructure parts of our organization, and train and integrate new employees. In addition, to attract highly and retain skilled personnel, we have had to offer, and believe we will need to continue to offer, highly competitive compensation packages. We may need to invest significant amounts of cash and equity to attract and retain new employees and we may not realize sufficient return on these investments. In addition, changes to U.S. immigration and work authorization laws and regulations can be significantly affected by political forces and levels of economic activity. Our business may be materially adversely affected if legislative or administrative changes to immigration or visa laws and regulations impair our hiring processes or projects involving personnel who are not citizens of the country where the work is to be performed. If we are not able to effectively attract and retain employees, we may not be able to innovate or execute quickly on our strategy and our ability to achieve our strategic objectives will be adversely impacted, and our business will be harmed.

We also believe that our culture and core values have been, and will continue to be, a key contributor to our success and our ability to foster the innovation, creativity and teamwork we believe we need to support our operations. If we fail to effectively manage our hiring needs and successfully integrate our new hires, our efficiency and ability to meet our forecasts and our culture, employee morale, productivity and retention could suffer, and our business and operating results could be adversely affected.

If we fail to monetize effectively in international markets, our revenue and our business will be harmed.

We may not be able to monetize our products and services internationally as effectively as in the United States as a result of competition, advertiser demand, differences in the digital advertising market and digital advertising conventions, as well as differences in the way that users in different countries access or utilize our products and services. For example, a significant portion of users in emerging markets like India and Pakistan use feature phones and communicate via SMS messaging, both of which have limited functionality and neither of which may be able to take full advantage of our products and services offered on smartphone or our website or desktop applications. Users who access Twitter through SMS messaging may monetize at lower rates than other users. Differences in the competitive landscape in international markets may impact our ability to monetize our products and services. For example, in South Korea we face intense competition from a messaging service offered by Kakao, which offers some of the same communication features as Twitter. The existence of a well-established competitor in an international market may adversely affect our ability to increase our user base, attract content partners, advertisers and platform partners and monetize our products in such market. We may also experience differences in advertiser demand in international markets. For example, during times of political upheaval, advertisers may choose not to advertise on Twitter. Certain international markets are also not as familiar with digital advertising in general, or in new forms of digital advertising such as our Promoted Products. Further, we face challenges in providing certain advertising products, features or analytics in certain international markets, such as the European Union, due to government regulation. Our products and services may also be used differently abroad than in the United States. In particular, in certain international markets where Internet access is not as rapid or reliable as in the United States, users tend not to take advantage of certain features of our products and services, such as rich media included in Tweets, video or live streaming video. The limitation of mobile devices of users in emerging and other markets limits our ability to deliver certain features to those users and may limit the ability of advertisers to deliver compelling advertisements to users in these markets, which may result in reduced ad engagements, which would adversely affect our business and operating results.

If our revenue from our international operations, and particularly from our operations in the countries and regions where we have focused our spending, does not exceed the expense of establishing and maintaining these operations, our business and operating results will suffer. In addition, our user base may expand more rapidly in international regions where we are less successful in monetizing our products and services. As our user base continues to expand internationally, we will need to increase revenue from the activity generated by our international users in order to grow our business. For example, average mDAUs outside the United States constituted 79% of our average mDAUs in the three months ended December 31, 2018, but our international revenue, as determined based on the billing location of our customers, was only 44% of our consolidated revenue in the three months ended December 31, 2018. Our inability to successfully expand our business internationally could adversely affect our business, financial condition and operating results.

User growth and engagement depend upon effective interoperation with operating systems, networks, devices, web browsers and standards that we do not control.

We make our products and services available across a variety of operating systems and through websites. We are dependent on the interoperability of our products and services with popular devices, desktop and mobile operating systems and web browsers that we do not control, such as Mac OS, iOS, Windows, Android, Chrome and Firefox. Any changes, bugs or technical issues in such systems, devices or web browsers or changes in our relationships with mobile operating system partners or mobile carriers, or in their terms of service or policies that diminish the functionality of our products and services, make it difficult for our users to access our content, limit our ability to target or measure the effectiveness of ads, impose fees related to our products or services or give preferential treatment to competitive products or services could adversely affect usage of our products and services. For example, many of our relationships with our mobile carriers to deliver our SMS messages were originally negotiated as free or low-cost connections, but recently some of the mobile carriers have been proposing fee increases for these arrangements, which may not be cost-effective for us. This may, in turn, adversely affect the number of users who receive our SMS messages. Additionally, some of our mobile carriers have experienced infrastructure issues due to natural disasters, which have caused deliverability errors or poor quality communications with our products. Any such errors, regardless of whether caused by our infrastructure or that of the service provider, may result in the loss of our existing users or may make it difficult to attract new users. Further, if the number of platforms for which we develop our product expands, it will result in an increase in our operating expenses. In order to deliver high quality products and services, it is important that our products and services work well with a range of operating systems, networks, devices, web browsers and standards that we do not control. In addition, because a majority of our users access our products and services through mobile devices, we are particularly dependent on the interoperability of our products and services with mobile devices and operating systems in order to deliver our products and services. We also may not be successful in developing relationships with key participants in the mobile industry or in developing products or services that operate effectively with these operating systems, networks, devices, web browsers and standards. In the event that it is difficult for our users to access and use our products and services, particularly on their mobile devices, our mDAU could be harmed, and our business and operating results could be adversely affected.

Our products and services may contain undetected software errors, which could harm our business and operating results.

Our products and services incorporate complex software and we encourage employees to quickly develop and help us launch new and innovative features. Our software, including any open source software that is incorporated into our code, has contained, and may now or in the future contain, errors, bugs or vulnerabilities. For example, in May 2018, we announced that an internal bug had resulted in the storage of passwords unmasked in an internal log. When users set a password for their Twitter accounts, we secure those passwords in a format that prevents anyone at Twitter from seeing or knowing the actual password through a password hashing function, which replaces the actual password with a random set of numbers and letters that are stored in Twitter’s system. Due to a bug, passwords were written to a service log before completing the hashing process. We found this error ourselves, removed the passwords from the logs, and are implementing plans to prevent this bug from happening again. Our investigation shows no indication of breach or misuse by anyone. In September 2018, we announced an internal bug related to our Account Activity API, which allows registered developers to build customer support and engagement tools for businesses and others on Twitter. This bug may have caused some of the customer communications and engagements with businesses and others on Twitter to be unintentionally sent to another registered developer. Although our initial analysis indicates that a complex series of technical circumstances had to occur at the same time for this bug to have resulted in account information definitively being shared with the wrong recipient, we contacted our developer partners to ensure that they are complying with their obligations to delete information they should not have in their possession. As was the case with these errors, errors in our software code may only be discovered after the product or service has been released. Errors, vulnerabilities, or other design defects within the software on which we rely may result in a negative experience for users, partners and advertisers who use our products, delay product introductions or enhancements, result in targeting, measurement, or billing errors, compromise our ability to protect the data of our users and/or our intellectual property or lead to reductions in our ability to provide some or all of our services. Any errors, bugs or vulnerabilities discovered in our code after release could result in damage to our reputation, loss of users, loss of content or platform partners, loss of advertisers or advertising revenue or liability for damages or other relief sought in lawsuits, regulatory inquiries or other proceedings, any of which could adversely affect our business and operating results.

Our ability to convince potential and new users of the value of our products and services is critical to increasing our user base and to the success of our business.

We have developed a global platform that we believe is the best and fastest place to see what's happening and what people are talking about all around the world, but the market for our products and services is relatively new and may not develop as expected, if at all. Despite our efforts to reduce barriers to consumption, people who are not our users may not understand the value of our products and services and new users may initially find our products confusing, which may make retention of such users more difficult. There may be a perception that our products and services are only useful to users who Tweet, or to influential users with large audiences. Convincing potential and new users of the value of our products and services is critical to increasing our user base, user engagement and to the success of our business.

If we fail to educate potential users and potential advertisers about the value of our products and services, if the market for our platform does not develop as we expect or if we fail to address the needs of this market, our business will be harmed. Failure to adequately address these risks and challenges could harm our business and cause our operating results to suffer.

Our business depends on continued and unimpeded access to our products and services on the Internet by our users, content partners, advertisers, and platform partners. If we or our users experience disruptions in Internet service or if Internet service providers are able to block, degrade or charge for access to our products and services, we could incur additional expenses and the loss of users and advertisers.

We depend on the ability of our users, content partners, advertisers and platform partners to access the Internet. Currently, this access is provided by companies that have significant market power in the broadband and Internet access marketplace, including incumbent telephone companies, cable companies, mobile communications companies, government-owned service providers, device manufacturers and operating system providers, any of whom could take actions that degrade, disrupt or increase the cost of user access to our products or services, which would, in turn, negatively impact our business. The adoption or repeal of any laws or regulations that adversely affect the growth, popularity or use of the Internet, including laws or practices limiting Internet neutrality, could decrease the demand for, or the usage of, our products and services, increase our cost of doing business and adversely affect our operating results. For example, access to Twitter is blocked in China and has been intermittently blocked in Turkey in the past and certain of our SMS messages have been blocked in Saudi Arabia. We also rely on other companies to maintain reliable network systems that provide adequate speed, data capacity and security to us and our users. As the Internet continues to experience growth in the number of users, frequency of use and amount of data transmitted, the Internet infrastructure that we and our users rely on may be unable to support the demands placed upon it. The failure of the Internet infrastructure that we or our users rely on, even for a short period of time, could undermine our operations and harm our operating results.

Our new products, product features, services and initiatives and changes to existing products, services and initiatives could fail to attract users, content partners, advertisers and platform partners or generate revenue.

Our industry is subject to rapid and frequent changes in technology, evolving customer needs and the frequent introduction by our competitors of new and enhanced offerings. We must constantly assess the playing field and determine whether we need to improve or re-allocate resources amongst our existing products and services or create new ones (independently or in conjunction with third parties). Our ability to increase the size and engagement of our user base, attract content partners, advertisers and platform partners and generate revenue will depend on those decisions. We may introduce significant changes to our existing products and services or develop and introduce new and unproven products and services, including technologies with which we have little or no prior development or operating experience. For example, in 2015, we introduced Periscope, a mobile application that lets users share and experience live video from their mobile phones and in 2013, we introduced Vine, a mobile application that enabled users to create and distribute videos that are up to six seconds in length, which we discontinued in January 2017. Also, we introduced new features to Twitter such as “Moments”, a curated collection of Tweets, photos, videos, and Periscope broadcasts about current news stories or events; “In Case You Missed It,” which surfaces Tweets a logged-in user may have missed since last accessing Twitter; expanding our character limit to 280 characters for more people around the world; and “Threads,” a new feature that allows people to more easily thread Tweets together. If new or enhanced products, product features or services fail to engage users, content partners and advertisers, we may fail to attract or retain users or to generate sufficient revenue or operating profit to justify our investments, and our business and operating results could be adversely affected. In addition, we have launched and expect to continue to launch strategic initiatives that do not directly generate revenue but which we believe will enhance our attractiveness to users, content partners and advertisers, such as our investments in the health of public conversation on Twitter. In the future, we may invest in new products, product features, services and initiatives to generate revenue, but there is no guarantee these approaches will be successful. We may not be successful in future efforts to generate revenue from our new products or services. If our strategic initiatives do not enhance our ability to monetize our existing products and services, enable us to develop new approaches to monetization or meet the expectations of our users or third-party business partners, we may not be able to maintain or grow our revenue or recover any associated development costs and our operating results could be adversely affected.

If we fail to effectively manage changes to our business and operations, our business and operating results could be harmed.

Providing our products and services to our users is costly and we expect certain of our expenses to continue to increase in the future as we broaden our user base and increase user engagement, as users increase the amount of content they contribute, and as we develop and implement new features, products and services that require more infrastructure, in particular our video product features. Historically, our operating expenses, such as our research and development expenses and sales and marketing expenses, have grown each year as we have expanded our business. As a result, our costs have increased each year due to these factors and we expect to continue to incur increasing costs to support our operations. We expect to continue to invest in our infrastructure so that we can provide our products and services rapidly and reliably to users around the world, including in countries where we do not expect significant near-term monetization.

We intend to fully invest in our highest priorities, while eliminating investment in noncore areas. Finding and maintaining the appropriate balance will require significant expenditures and allocation of valuable management resources. If we fail to achieve the necessary level of efficiency in our organization, our business, operating results and financial condition would be harmed.

We focus on the long-term health of our platform, product innovation, and providing something valuable to people on Twitter every day, rather than short-term operating results.

We encourage employees to quickly develop and help us launch new and innovative features. We focus on improving the user experience for our products and services, which includes protecting user privacy, and on developing new and improved products and services for the advertisers on our platform. For example, we are making investments in improving the health of the public conversation on Twitter, focusing on the long-term health of the platform over near-term metrics. We prioritize innovation and the experience for users and advertisers on our platform over short-term operating results. We frequently make product, product feature and service decisions that may reduce our short-term operating results if we believe that the decisions are consistent with our goals to improve the user experience and performance for advertisers, which we believe will improve our operating results over the long term. For example, we are investing in our live-streaming video experiences, and we may not successfully monetize such experiences. These decisions may not be consistent with the short-term expectations of investors and may not produce the long-term benefits that we expect, in which case our user growth and user engagement, our relationships with advertisers and our business and operating results could be harmed. In addition, our focus on the user experience may negatively impact our relationships with our existing or prospective advertisers. This could result in a loss of advertisers, which could harm our revenue and operating results.

Our business and operating results may be harmed by a disruption in our service, or by our failure to timely and effectively scale and adapt our existing technology and infrastructure.

One of the reasons people come to Twitter every day is for real-time information. We have experienced, and may in the future experience, service disruptions, outages and other performance problems due to a variety of factors, including infrastructure changes, human or software errors, hardware failure, capacity constraints due to an overwhelming number of people accessing our products and services simultaneously, computer viruses and denial of service or fraud or security attacks. For instance, in the past, we have experienced brief service outages during which Twitter.com and Twitter mobile clients were inaccessible as a result, in part, of software misconfigurations. Additionally, although we are investing significantly to improve the capacity, capability and reliability of our infrastructure, we are not currently serving traffic equally through our co-located data centers that support our platform. Accordingly, in the event of a significant issue at the data center supporting most of our network traffic, some of our products and services may become inaccessible to the public or the public may experience difficulties accessing our products and services. Any disruption or failure in our infrastructure could hinder our ability to handle existing or increased traffic on our platform, which could significantly harm our business.

We utilize third-party cloud computing services in connection with certain aspects of our business and operations, and any disruption of, or interference with, our use of such cloud services could adversely impact our business and operations.

As our user base expands and our users generate more content, including photos and videos hosted by Twitter, we may be required to expand and adapt our technology and infrastructure to continue to reliably store, serve and analyze this content. It may become increasingly difficult to maintain and improve the performance of our products and services, especially during peak usage times, as our products and services become more complex and our user traffic increases. In addition, because we lease our data center facilities, we cannot be assured that we will be able to expand our data center infrastructure to meet user demand in a timely manner, or on favorable economic terms. If our users are unable to access Twitter or we are not able to make information available rapidly on Twitter, users may seek other channels to obtain the information, and may not return to Twitter or use Twitter as often in the future, or at all. This would negatively impact our ability to attract users, content partners and advertisers and increase the frequency of users returning to Twitter. We expect to continue to make significant investments to maintain and improve the capacity, capability and reliability of our infrastructure. To the extent that we do not effectively address capacity constraints, upgrade our systems as needed and continually develop our technology and infrastructure to accommodate actual and anticipated changes in technology, our business and operating results may be harmed.

We continue to scale the capacity of, and enhance the capability and reliability of, our infrastructure to support user growth and increased activity on our platform. As our user base and the activity on our platform grow, we expect that investments and expenses associated with our infrastructure will continue to grow. These investments and expenses include the expansion and improvement of our data center operations and related operating costs, additional servers and networking equipment to increase the capacity of our infrastructure, increased utilization of third-party cloud computing and associated costs thereof, increased bandwidth costs, and costs to secure our customers' data. The improvement of our infrastructure requires a significant investment of our management's time and our financial resources.

We have incurred significant operating losses in the past, and we may not be able to maintain profitability.

Since our inception, we have incurred significant operating losses, and, as of December 31, 2018, we had an accumulated deficit of $1.45 billion. Our revenue has grown from $664.9 million in 2013 to $3.04 billion in 2018. While we were profitable on a GAAP basis in 2018, we believe that our future revenue growth and our ability to maintain profitability will depend on, among other factors, our ability to attract new users, increase user engagement and ad engagement, increase our brand awareness, compete effectively, maximize our sales efforts, demonstrate a positive return on investment for advertisers, and successfully develop new products and services. Accordingly, you should not rely on the revenue growth of any prior quarterly or annual period as an indication of our future performance. Our costs may increase in future periods as we continue to expend substantial financial resources on:

- our technology infrastructure;
- research and development for our products and services;
- sales and marketing;
- attracting and retaining talented employees;
- strategic opportunities, including commercial relationships and acquisitions; and
- general administration, including personnel costs and legal and accounting expenses related to being a public company.

These investments may not result in increased revenue or growth in our business. Additionally, certain new revenue products or product features may carry higher costs relative to our other products, which may decrease our margins. If we are unable to generate adequate revenue growth and to manage our expenses, we may incur significant losses in the future and may not be able to maintain profitability.

If we are unable to maintain and promote our brand, our business and operating results may be harmed.

We believe that maintaining and promoting our brand is critical to expanding our base of users, content partners and advertisers. Maintaining and promoting our brand will depend largely on our ability to continue to provide useful, reliable and innovative products and services with a focus on a positive user experience, which we may not do successfully. We may introduce new features, products, services or terms of service that users, content partners, advertisers or platform partners do not like, which may negatively affect our brand. Additionally, the actions of content partners may affect our brand if users do not have a positive experience using third-party applications or websites integrated with Twitter or that make use of Twitter content. We will also continue to experience media, legislative or regulatory scrutiny of our decisions regarding user privacy, security, content and other issues, which may adversely affect our reputation and brand. For example, we previously announced our discovery of content (including some advertisements) displayed on our products that may be relevant to government investigations relating to Russian interference in the 2016 U.S. presidential election, which continues to draw media and regulatory scrutiny of our actions with respect to such content. Our brand may also be negatively affected by the actions of users that are hostile or inappropriate to other people, by users impersonating other people, by users identified as spam, by use or perceived use, directly or indirectly, of our products or services by users (including governments and government-sponsored actors) to disseminate information that may be viewed as misleading (or intended to manipulate the opinions of our users), by users introducing excessive amounts of spam on our platform, by third parties obtaining control over users' accounts or by other security or cybersecurity incidents. For example, certain actions taken by a social media marketing company in the past to sell followers and engagement, which were in violation of our policies, but that drew media and regulatory scrutiny on us. Maintaining and enhancing our brand may require us to make substantial investments and these investments may not achieve the desired goals. If we fail to successfully promote and maintain our brand or if we incur excessive expenses in this effort, our business and operating results could be adversely affected.

Negative publicity could adversely affect our business and operating results.

We receive a high degree of media coverage around the world. Negative publicity about our company, including about the quality and reliability of our products or of content shared on our platform, changes to our products and services, our privacy and security practices (including actions taken with respect to certain users or accounts or reports regarding government surveillance), litigation, regulatory activity, the actions of our users (including actions taken by prominent users on our platform or the dissemination of information that may be viewed as misleading or as intended to manipulate the opinions of our users), or user experience with our products and services, even if inaccurate, could adversely affect our reputation and the confidence in and the use of our products and services. Such negative publicity could also have an adverse effect on the size, engagement and loyalty of our user base and result in decreased revenue, which could adversely affect our business and operating results.

Spam and fake accounts could diminish the user experience on our platform, which could damage our reputation and deter our current and potential users from using our products and services.

“Spam” on Twitter refers to a range of abusive activities that are prohibited by our terms of service and is generally defined as unsolicited, repeated actions that negatively impact other users with the general goal of drawing user attention to a given account, site, product or idea. This includes posting large numbers of unsolicited mentions of a user, duplicate Tweets, malicious automation, misleading links (e.g., to malware or “click-jacking” pages) or other false or misleading content, and aggressively following and un-following accounts, adding users to lists, sending invitations, Retweeting and liking Tweets to inappropriately attract attention. Our terms of service also prohibit the creation of serial or bulk accounts, both manually or using automation, for disruptive or abusive purposes, such as to Tweet spam or to artificially inflate the popularity of users seeking to promote themselves on Twitter. Although we continue to invest resources to reduce spam and fake accounts on Twitter, which includes our investments to improve the health of the public conversation on Twitter, we expect spammers will continue to seek ways to act inappropriately on our platform. In addition, we expect that increases in the number of users on our platform will result in increased efforts by spammers to misuse our platform. We continuously combat spam and fake accounts, including by suspending or terminating accounts we believe to be spammers and launching algorithmic changes focused on curbing abusive activities. Our actions to combat spam and fake accounts require significant resources and time. If spam and fake accounts increase on Twitter, this could hurt our reputation for delivering relevant content or reduce user growth rate and user engagement and result in continuing operational cost to us.

Action by governments to restrict access to our products and services or censor Twitter content could harm our business and operating results.

Governments have sought, and may in the future seek, to censor content available through our products and services, restrict access to our products and services from their country entirely or impose other restrictions that may affect the accessibility of our products and services for an extended period of time or indefinitely. For example, domestic Internet service providers in China have blocked access to Twitter, and other countries, including Iran, Libya, Pakistan, Turkey and Syria, have intermittently restricted access to Twitter, and we believe that access to Twitter has been blocked in these countries primarily for political reasons. In addition, governments in these or other countries may seek to restrict access to our products and services based on our decisions around user content, providing user information in response to governmental requests, or other matters. In the event that access to our products and services is restricted, in whole or in part, in one or more countries or our competitors are able to successfully penetrate geographic markets that we cannot access, our ability to retain or increase our user base and user engagement may be adversely affected, and our operating results may be harmed.

If our security measures are breached, or if our products and services are subject to attacks that degrade or deny the ability of users to access our products and services, our products and services may be perceived as not being secure, users and advertisers may curtail or stop using our products and services and our business and operating results could be harmed.

Our products and services involve the storage and transmission of users’ and advertisers’ information, and security breaches expose us to a risk of loss of this information, litigation, increased security costs and potential liability. We also work with third-party vendors to process credit card payments by our customers and are subject to payment card association operating rules. We and our third-party service providers experience cyber-attacks of varying degrees on a regular basis. For example, in October 2016, we experienced a service outage as a result of several distributed denial of service attacks on our domain name service provider, Dyn.

Our products operate in conjunction with, and we are dependent upon, third-party products and components across a broad ecosystem. Additionally, the natural sunsetting of third-party products and operating systems that we use requires that our infrastructure teams reallocate time and attention to migration and updates, during which period potential security vulnerabilities could be exploited. If there is a security vulnerability (such as the Spectre and Meltdown vulnerabilities) in one of these components and if there is a security exploit targeting it, we could face increased costs, liability claims, reduced revenue, or harm to our reputation or competitive position.

Third parties may also gain access to Twitter user names and passwords without attacking Twitter directly by combining credential information from other recent breaches, using malware on victim machines that are stealing passwords for all sites, or a combination of both. In addition, some of our developers or other partners, such as third-party applications to which our users have given permission to Tweet on their behalf, may receive or store information provided by us or by our users through mobile or web applications integrated with us. If these third parties or developers fail to adopt or adhere to adequate data security practices, or in the event of a breach of their networks, our data or our users' data may be improperly accessed, used, or disclosed.

As a result, unauthorized parties have obtained, and may in the future obtain, access to our data or our users’ or advertisers’ data. In addition, a breach of a third-party application that has been trusted by a user could result in the account issuing Tweets, Likes, Retweets, or Direct Messages without such user’s knowledge or consent. Any systems failure or actual or perceived compromise of our security that results in the unauthorized access to or release of our users’ or advertisers’ data, such as credit card data, could significantly limit the adoption of our products and services, as well as harm our reputation and brand and, therefore, our business.

Our security measures may also be breached due to employee error, malfeasance or otherwise. Additionally, outside parties may attempt to fraudulently induce employees, users or advertisers to disclose sensitive information in order to gain access to our data or our users' or advertisers' data or accounts, or may otherwise obtain access to such data or accounts. Since our users and advertisers may use their Twitter accounts to establish and maintain online identities, unauthorized communications from Twitter accounts that have been compromised may damage their personal security, reputations and brands as well as our reputation and brand. Because the techniques used to obtain unauthorized access, disable or degrade service or sabotage systems change frequently and often are not recognized until launched against a target, we may be unable to anticipate these techniques or to implement adequate preventative measures. We expect to incur significant costs in an effort to detect and prevent security breaches and other security-related incidents, and we may face increased costs in the event of an actual or perceived security breach or other security-related incident. If an actual or perceived breach of our security occurs, the market perception of the effectiveness of our security measures could be harmed, our users and advertisers may be harmed, lose trust and confidence in us, decrease the use of our products and services or stop using our products and services in their entirety. We may also incur significant legal and financial exposure, including legal claims, higher transaction fees and regulatory fines and penalties. Any of these actions could have a material and adverse effect on our business, reputation and operating results.

While our insurance policies include liability coverage for certain of these matters, if we experienced a significant security incident, we could be subject to liability or other damages that exceed our insurance coverage.

Our future performance depends in part on support from our content partners and data partners.

We believe user engagement with our products and services depends in part on the availability of applications and content generated by our content or platform partners. There is no assurance that our content or platform partners will continue to develop and maintain applications and content for our products and services, and if they cease to, then user engagement may decline. In addition, we generate revenue from licensing our historical and real-time data to third parties. If any of these relationships are terminated or not renewed on economic and other terms that are acceptable to us, or if we are unable to enter into similar relationships in the future, our operating results could be adversely affected.

Our international operations are subject to increased challenges and risks.

We have offices around the world and our products and services are available in multiple languages. However, our ability to manage our business and conduct our operations internationally requires considerable management attention and resources and is subject to the particular challenges of supporting a rapidly growing business in an environment of multiple languages, cultures, customs, legal and regulatory systems, alternative dispute systems and commercial markets. Our international operations have required and will continue to require us to invest significant funds and other resources. Operating internationally subjects us to new risks and may increase risks that we currently face, including risks associated with:

- recruiting and retaining talented and capable employees in foreign countries and maintaining our company culture across all of our offices;
- providing our products and services and operating across a significant distance, in different languages and among different cultures, including the potential need to modify our products, services, content and features to ensure that they are culturally relevant in different countries;
- increased competition from largely regional websites, mobile applications and services that provide real-time communications and have strong positions in particular countries, which have expanded and may continue to expand their geographic footprint;
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differing and potentially lower levels of user growth, user engagement and ad engagement in new and emerging geographies;

- different levels of advertiser demand;
- greater difficulty in monetizing our products and services;
- compliance with applicable foreign laws and regulations, including laws and regulations with respect to privacy, data security, consumer protection, copyright, fake news, hate speech, spam and content, and the risk of penalties to our users and individual members of management if our practices are deemed to be out of compliance;

- burdens of complying with various foreign laws, including laws related to taxation, content removal, data localization, and regulatory oversight;
- longer payment cycles in some countries;
- credit risk and higher levels of payment fraud;
- operating in jurisdictions that do not protect intellectual property rights to the same extent as the United States;
- compliance with anti-bribery laws including, without limitation, compliance with the Foreign Corrupt Practices Act and the U.K. Bribery Act, including by our business partners;
- currency exchange rate fluctuations;
- foreign exchange controls that might require significant lead time in setting up operations in certain geographic territories and might prevent us from repatriating cash earned outside the United States;
- political and economic instability in some countries;
- double taxation of our international earnings and potentially adverse tax consequences due to changes in the tax laws of the United States or the foreign jurisdictions in which we operate; and
- higher costs of doing business internationally, including increased accounting, travel, infrastructure and legal compliance costs.

If we are unable to manage the complexity of our global operations successfully, our business, financial condition and operating results could be adversely affected.

Our business is subject to complex and evolving U.S. and foreign laws and regulations. These laws and regulations are subject to change and uncertain interpretation, and could result in claims, changes to our business practices, monetary penalties, increased cost of operations or declines in user growth, user engagement or ad engagement, or otherwise harm our business.

We are subject to a variety of laws and regulations in the United States and abroad that involve matters central to our business, including privacy, security, rights of publicity, data protection, content regulation, intellectual property, competition, protection of minors, consumer protection, credit card processing and taxation. Many of these laws and regulations are still evolving and being tested in courts. As a result, it is possible that these laws and regulations may be interpreted and applied in a manner that is inconsistent from country to country and inconsistent with our current policies and practices and in ways that could harm our business, particularly in the new and rapidly evolving industry in which we operate. Additionally, the introduction of new products or services may subject us to additional laws and regulations.

From time to time, governments, regulators and others have expressed concerns about whether our products, services or practices compromise the privacy of users and others. While we strive to comply with applicable data protection laws and regulations, as well as our own posted privacy policies and other obligations we may have with respect to privacy and data protection, the failure or perceived failure to so comply may result, and in some cases has resulted, in inquiries and other proceedings or actions against us by governments, regulators or others. A number of proposals have recently been adopted or are currently pending before federal, state and foreign legislative and regulatory bodies that could significantly affect our business. For example, in June 2018 California recently enacted legislation, the California Consumer Privacy Act, or CCPA, that will, among other things, require covered companies to provide new disclosures to California consumers, and afford such consumers new abilities to opt-out of certain sales of personal information, when it goes into effect on January 1, 2020. The CCPA was amended in September 2018, and it remains unclear what, if any, modifications will be made to this legislation or how it will be interpreted. Moreover, foreign data protection, privacy, consumer protection, content regulation and other laws and regulations are often more restrictive than those in the United States. In particular, the European Union, or EU, and its member states traditionally have taken broader views as to types of data that are subject to privacy and data protection, and have imposed greater legal obligations on companies in this regard. For example, the GDPR has been adopted and went into effect in May 2018. The GDPR includes more stringent operational requirements for entities processing personal information and significant penalties for non-compliance, including fines of up to €20 million or 4% of total worldwide revenue, whichever is higher. Additionally, we rely on a variety of legal bases to transfer certain personal information outside of the European Economic Area, including the EU-U.S. Privacy Shield Framework, the Swiss-U.S. Privacy Shield Framework, and EU Standard Contractual Clauses, or SCCs. The EU-U.S. Privacy Shield Framework is currently under review by regulatory authorities and it and the SCCs are both the subject of legal challenges in European courts, and they may be modified or invalidated. The absence of successor legal bases for continued data transfer could require us to create duplicative, and potentially expensive, information technology infrastructure and business operations in Europe or limit our ability to collect and use personal information collected in Europe. Any of these changes with respect to EU data protection law could disrupt our business.

Further, following a referendum in June 2016 in which voters in the United Kingdom approved an exit from the EU, the United Kingdom government has initiated a process to leave the EU (often referred to as “Brexit”). Without further agreement between the United Kingdom and the EU, the United Kingdom will formally leave the EU in March 2019. Brexit could lead to economic and legal uncertainty in the region and could adversely affect the tax, currency, operational, legal and regulatory regimes to which our business is subject. Brexit may adversely affect our revenues and subject us to new regulatory costs and challenges, in addition to other adverse effects that we are unable effectively to anticipate.

The United Kingdom recently implemented a Data Protection Bill that substantially implements the GDPR, which became law in May 2018. Brexit has created uncertainty with regard to whether the EU will view the UK data protection regulation as adequate under GDPR. Until that is resolved, the requirements for data transfers between the United Kingdom and the EU are unclear.

Legislative changes in the United States, at both the federal and state level, that could impose new obligations in areas such as privacy and liability for copyright infringement or content by third parties such as various Congressional efforts to restrict the scope of the protections available to online platforms under Section 230 of the Communications Decency Act, and our current protections from liability for third-party content in the United States could decrease or change. Additionally, recent amendments to U.S. patent laws may affect the ability of companies, including us, to protect their innovations and defend against claims of patent infringement.

Similarly, the EU’s proposed Directive on Copyright in the Digital Single Market (the EU Copyright Directive), if enacted as currently proposed, would expand the liability of online platforms for user-generated content and would obligate platforms to negotiate licenses with rightsholders and ensure that unauthorized copyrighted material is not available on their platforms. The EU Copyright Directive would also give publishers rights over snippets of news content displayed online and restrict platforms' ability to display such material. If enacted, the EU Copyright Directive would increase our costs of operations and increase our liability for user-generated content.

Additionally, we have relationships with third parties that perform a variety of functions such as payments processing, tokenization, vaulting, currency conversion, fraud prevention and data security audits. The laws and regulations related to online payments are complex, subject to change, and vary across different jurisdictions in the United States and globally. As a result, we may be required to spend significant time, effort and expense to comply with applicable laws and regulations. Any failure or claim of our failure to comply, or any failure or claim of failure by the above-mentioned third parties to comply, could increase our costs or could result in liabilities. Additionally, because Twitter accepts payment via credit cards and is certified as a PCI Level 1 service provider, we are subject to payment card association operating rules and certification requirements, including the Payment Card Industry Data Security Standard.

We currently allow use of our platform without the collection of extensive personal information, such as age. We may experience additional pressure to expand our collection of personal information in order to comply with new and additional regulatory demands or we may independently decide to do so. If we obtain such additional personal information, we may be subject to additional regulation.

Regulatory investigations and settlements could cause us to incur additional expenses or change our business practices in a manner materially adverse to our business.

We are currently the subject of inquiries by the Irish Data Protection Commission with respect to our compliance with the GDPR and expect to continue to be subject to regulatory scrutiny as our business grows and awareness of our brand increases, In the past, we have been subject to regulatory investigations, and expect to continue to be subject to regulatory scrutiny as our business grows and awareness of our brand increases. In March 2011, to resolve an investigation into various incidents, we entered into a settlement agreement with the FTC that, among other things, required us to establish an information security program designed to protect non-public consumer information and also requires that we obtain biennial independent security assessments. The obligations under the settlement agreement remain in effect until the later of March 2, 2031, or the date 20 years after the date, if any, on which the U.S. government or the FTC files a complaint in federal court alleging any violation of the order. We expect to continue to be the subject of regulatory inquiries, investigations and audits in the future by the FTC and other regulators around the world.

It is possible that a regulatory inquiry, investigation or audit might result in changes to our policies or practices, and may cause us to incur substantial costs or could result in reputational harm, prevent us from offering certain products, services, features or functionalities, cause us to incur substantial costs or require us to change our business practices in a manner materially adverse to our business. Violation of existing or future regulatory orders, settlements or consent decrees could subject us to substantial monetary fines and other penalties that could negatively affect our financial condition and operating results.

We may face lawsuits or incur liability as a result of content published or made available through our products and services.

We have faced and will continue to face claims relating to content that is published or made available through our products and services or third-party products or services. In particular, the nature of our business exposes us to claims related to defamation, intellectual property rights, rights of publicity and privacy, illegal content, misinformation, content regulation and personal injury torts. The laws relating to the liability of providers of online products or services for activities of their users remains somewhat unsettled, both within the United States and internationally. This risk may be enhanced in certain jurisdictions outside the United States where we may be less protected under local laws than we are in the United States. For example, we are subject to legislation in Germany that may impose significant fines for failure to comply with certain content removal and disclosure obligations. In addition, the public nature of communications on our network exposes us to risks arising from the creation of impersonation accounts intended to be attributed to our users or advertisers. We could incur significant costs investigating and defending these claims. If we incur material costs or liability as a result of these occurrences, our business, financial condition and operating results could be adversely affected.

Our intellectual property rights are valuable, and any inability to protect them could reduce the value of our products, services and brand.

Our trade secrets, trademarks, copyrights, patents and other intellectual property rights are important assets. We rely on, and expect to continue to rely on, a combination of confidentiality and license agreements with our employees, consultants and third parties with whom we have relationships, as well as trademark, trade dress, domain name, copyright, trade secret and patent laws, to protect our brand and other intellectual property rights. However, various events outside of our control pose a threat to our intellectual property rights, as well as to our products, services and technologies. For example, we may fail to obtain effective intellectual property protection, or effective intellectual property protection may not be available in every country in which our products and services are available. Also, the efforts we have taken to protect our intellectual property rights may not be sufficient or effective, and any of our intellectual property rights may be challenged, which could result in them being narrowed in scope or declared invalid or unenforceable. There can be no assurance our intellectual property rights will be sufficient to protect against others offering products or services that are substantially similar to ours and compete with our business.

We rely on non-patented proprietary information and technology, such as trade secrets, confidential information, know-how and technical information. While in certain cases we have agreements in place with employees and third parties that place restrictions on the use and disclosure of this intellectual property, these agreements may be breached, or this intellectual property may otherwise be disclosed or become known to our competitors, including through hacking or theft, which could cause us to lose any competitive advantage resulting from this intellectual property.

We are pursuing registration of trademarks and domain names in the United States and in certain jurisdictions outside of the United States. Effective protection of trademarks and domain names is expensive and difficult to maintain, both in terms of application and registration costs as well as the costs of defending and enforcing those rights. We may be required to protect our rights in an increasing number of countries, a process that is expensive and may not be successful or which we may not pursue in every country in which our products and services are distributed or made available.

We are party to numerous agreements that grant licenses to third parties to use our intellectual property, including our trademarks. For example, many third parties distribute their content through Twitter, or embed Twitter content in their applications or on their websites, and make use of our trademarks in connection with their services. If the licensees of our trademarks are not using our trademarks properly, it may limit our ability to protect our trademarks and could ultimately result in our trademarks being declared invalid or unenforceable. We have a policy designed to assist third parties in the proper use of our brand, trademarks and other assets, and we have an internal team dedicated to enforcing our policy and protecting our brand. Our brand protection team routinely receives and reviews reports of improper and unauthorized use of the Twitter brand, trademarks or assets and issues takedown notices or initiates discussions with the third parties to correct the issues. However, there can be no assurance that we will be able to protect against the unauthorized use of our brand, trademarks or other assets. If we fail to maintain and enforce our trademark rights, the value of our brand could be diminished. There is also a risk that one or more of our trademarks could become generic, which could result in them being declared invalid or unenforceable. For example, there is a risk that the word “Tweet” could become so commonly used that it becomes synonymous with any short comment posted publicly on the Internet, and if this happens, we could lose protection of this trademark.

We also seek to obtain patent protection for some of our technology. We may be unable to obtain patent protection for our technologies, and our existing patents, and any patents that may be issued in the future, may not provide us with competitive advantages or distinguish our products and services from those of our competitors. In addition, any patents may be contested, circumvented, or found unenforceable or invalid, and we may not be able to prevent third parties from infringing or otherwise violating them. Effective protection of patent rights is expensive and difficult to maintain, both in terms of application and maintenance costs, as well as the costs of defending and enforcing those rights.

Our Innovator's Patent Agreement, or IPA, also can limit our ability to prevent infringement of our patents. In May 2013, we implemented the IPA, which we enter into with our employees and consultants, including our founders. The IPA, which applies to our current and future patents, allows us to assert our patents defensively. The IPA also allows us to assert our patents offensively with the permission of the inventors of the applicable patent. Under the IPA, an assertion of claims is considered for a defensive purpose if the claims are asserted: (i) against an entity that has filed, maintained, threatened or voluntarily participated in a patent infringement lawsuit against us or any of our users, affiliates, customers, suppliers or distributors; (ii) against an entity that has used its patents offensively against any other party in the past ten years, so long as the entity has not instituted the patent infringement lawsuit defensively in response to a patent litigation threat against the entity; or (iii) otherwise to deter a patent litigation threat against us or our users, affiliates, customers, suppliers or distributors. In addition, the IPA provides that the above limitations apply to any future owner or exclusive licensee of any of our patents, which could limit our ability to sell or license our patents to third parties. While we may be able to claim protection of our intellectual property under other rights, such as trade secrets or contractual obligations with our employees not to disclose or use confidential information, we may be unable to assert our patent rights against third parties that we believe are infringing our patents, even if such third parties are developing products and services that compete with our products and services. For example, in the event that an inventor of one of our patents leaves us for another company and uses our patented technology to compete with us, we would not be able to assert that patent against such other company unless the assertion of the patent right is for a defensive purpose. In such event, we may be limited in our ability to assert a patent right against another company, and instead would need to rely on trade secret protection or the contractual obligation of the inventor to us not to disclose or use our confidential information. In addition, the terms of the IPA could affect our ability to monetize our intellectual property portfolio.

Significant impairments of our intellectual property rights, and limitations on our ability to assert our intellectual property rights against others, could harm our business and our ability to compete.

Also, obtaining, maintaining and enforcing our intellectual property rights is costly and time consuming. Any increase in the unauthorized use of our intellectual property could make it more expensive to do business and harm our operating results.

We are currently, and expect to be in the future, party to intellectual property rights claims that are expensive and time consuming to defend, and, if resolved adversely, could have a significant impact on our business, financial condition or operating results.

Companies in the internet, technology and media industries are subject to litigation based on allegations of infringement, misappropriation or other violations of intellectual property or other rights. Many companies in these industries, including many of our competitors, have substantially larger patent and intellectual property portfolios than we do, which could make us a target for litigation as we may not be able to assert counterclaims against parties that sue us for patent, or other intellectual property infringement. In addition, various "non-practicing entities" that own patents and other intellectual property rights often attempt to assert claims in order to extract value from technology companies. From time to time we receive claims from third parties which allege that we have infringed upon their intellectual property rights. Further, from time to time we may introduce new products, product features and services, including in areas where we currently do not have an offering, which could increase our exposure to patent and other intellectual property claims from competitors and non-practicing entities. In addition, although our standard terms and conditions for our Promoted Products and public APIs do not provide advertisers and platform partners with indemnification for intellectual property claims against them, some of our agreements with advertisers, content partners, platform partners and data partners require us to indemnify them for certain intellectual property claims against them, which could require us to incur considerable costs in defending such claims, and may require us to pay significant damages in the event of an adverse ruling. Such advertisers, content partners, platform partners and data partners may also discontinue use of our products, services and technologies as a result of injunctions or otherwise, which could result in loss of revenue and adversely impact our business.

We presently are involved in a number of intellectual property lawsuits, and as we face increasing competition and develop new products, we expect the number of patent and other intellectual property claims against us may grow. There may be intellectual property or other rights held by others, including issued or pending patents, that cover significant aspects of our products and services, and we cannot be sure that we are not infringing or violating, and have not infringed or violated, any third-party intellectual property rights or that we will not be held to have done so or be accused of doing so in the future. Any claim or litigation alleging that we have infringed or otherwise violated intellectual property or other rights of third parties, with or without merit, and whether or not settled out of court or determined in our favor, could be time-consuming and costly to address and resolve, and could divert the time and attention of our management and technical personnel. Some of our competitors have substantially greater resources than we do and are able to sustain the costs of complex intellectual property litigation to a greater degree and for longer periods of time than we could. The outcome of any litigation is inherently uncertain, and there can be no assurances that favorable final outcomes will be obtained in all cases. In addition, plaintiffs may seek, and we may become subject to, preliminary or provisional rulings in the course of any such litigation, including potential preliminary injunctions requiring us to cease some or all of our operations. We may decide to settle such lawsuits and disputes on terms that are unfavorable to us. Similarly, if any litigation to which we are a party is resolved adversely, we may be subject to an unfavorable judgment that may not be reversed upon appeal. The terms of such a settlement or judgment may require us to cease some or all of our operations or pay substantial amounts to the other party. In addition, we may have to seek a license to continue practices found to be in violation of a third-party's rights. If we are required, or choose to enter into royalty or licensing arrangements, such arrangements may not be available on reasonable terms, or at all, and may significantly increase our operating costs and expenses. As a result, we may also be required to develop or procure alternative non-infringing technology, which could require significant effort and expense or discontinue use of the technology. An unfavorable resolution of the disputes and litigation referred to above could adversely affect our business, financial condition and operating results.

Many of our products and services contain open source software, and we license some of our software through open source projects, which may pose particular risks to our proprietary software, products, and services in a manner that could have a negative effect on our business.

We use open source software in our products and services and will use open source software in the future. In addition, we regularly contribute software source code to open source projects under open source licenses or release internal software projects under open source licenses, and anticipate doing so in the future. The terms of many open source licenses to which we are subject have not been interpreted by U.S. or foreign courts, and there is a risk that open source software licenses could be construed in a manner that imposes unanticipated conditions or restrictions on our ability to provide or distribute our products or services. Additionally, we may from time to time face claims from third parties claiming ownership of, or demanding release of, the open source software or derivative works that we developed using such software, which could include our proprietary source code, or otherwise seeking to enforce the terms of the applicable open source license. These claims could result in litigation and could require us to make our software source code freely available, purchase a costly license or cease offering the implicated products or services unless and until we can re-engineer them to avoid infringement. This re-engineering process could require significant additional research and development resources, and we may not be able to complete it successfully. In addition to risks related to license requirements, use of certain open source software may pose greater risks than use of third-party commercial software, as open source licensors generally do not provide warranties or controls on the origin of software. Any of these risks could be difficult to eliminate or manage, and, if not addressed, could have a negative effect on our business, financial condition and operating results.

We rely on assumptions and estimates to calculate certain of our key metrics, and real or perceived inaccuracies in such metrics may harm our reputation and negatively affect our business.

The number of our active users is calculated using internal company data that has not been independently verified. While these numbers are based on what we believe to be reasonable calculations for the applicable period of measurement, there are inherent challenges in measuring usage and user engagement across our large user base around the world. For example, there are a number of false or spam accounts in existence on our platform. We estimate that the average of false or spam accounts during the fourth quarter of 2018 continued to represent fewer than 5% of our MAUs and mDAUs during the quarter. However, this estimate is based on an internal review of a sample of accounts and we apply significant judgment in making this determination. As such, our estimation of false or spam accounts may not accurately represent the actual number of such accounts, and the actual number of false or spam accounts could be higher than we have currently estimated. We are continually seeking to improve our ability to estimate the total number of spam accounts and eliminate them from the calculation of our active users, but we otherwise treat multiple accounts held by a single person or organization as multiple users for purposes of calculating our active users because we permit people and organizations to have more than one account. Additionally, some accounts used by organizations are used by many people within the organization. As such, the calculations of our active users may not accurately reflect the actual number of people or organizations using our platform. Further, we rely on third-party SMS aggregators and mobile carriers to deliver SMS messages to certain of our MAUs. If, however, we are notified of material deliverability issues because of, for example, infrastructure issues at the service-provider level or governmental restrictions based on content, we do not include the affected users in MAUs. We may also discover unexpected errors in our internal data that resulted from technical or other errors. For example, in 2017, we discovered that since the fourth quarter of 2014 we had included users of certain third-party applications as Twitter MAUs that should not have been considered MAUs. These third-party applications used Digits, a software development kit of our now-divested Fabric platform that allowed third-party applications to send authentication messages via SMS through our systems, which did not relate to activity on the Twitter platform. Although the change in the MAUs was relatively small in relation to our overall MAU numbers, we may face increased scrutiny on the calculation of our key metrics as a result of the error.

Our calculations of MAU may be affected by mobile applications that automatically contact our servers for regular updates with no discernable user-initiated action involved, and this activity can cause our system to count the user associated with such a device as an active user on the day such contact occurs. The impact of this automatic activity on MAU varies by geography because mobile application usage varies in different regions of the world. In addition, our data regarding user geographic location is based on the IP address or phone number associated with the account when a user initially registered the account on Twitter. That IP address or phone number may not always accurately reflect a user’s actual location at the time of such user’s engagement on our platform.

We regularly review and may adjust our processes for calculating our internal metrics to improve their accuracy. Our measures of user growth and user engagement may differ from estimates published by third parties or from similarly-titled metrics of our competitors due to differences in methodology. If advertisers, content or platform partners or investors do not perceive our user metrics to be accurate representations of our user base or user engagement, or if we discover material inaccuracies in our user metrics, our reputation may be harmed and content partners, advertisers and platform partners may be less willing to allocate their budgets or resources to our products and services, which could negatively affect our business and operating results. Further, as our business develops, we may revise or cease reporting metrics if we determine that such metrics are no longer accurate or appropriate measures of our performance. For example, we believe that mDAU, and its related growth, are the best ways to measure our success against our objectives and to show the size of our audience and engagement going forward, so we will discontinue disclosing MAU after the first quarter of 2019. In the past, we also stopped disclosing timeline views as we no longer believed that metric was helpful in measuring engagement on our platform. If investors, analysts or customers do not believe our reported measures, such as mDAU, are sufficient or accurately reflect our business, we may receive negative publicity and our operating results may be harmed.

We rely in part on application marketplaces and Internet search engines to drive traffic to our products and services, and if we fail to appear high up in the search results or rankings, traffic to our platform could decline and our business and operating results could be adversely affected.

We rely on application marketplaces, such as Apple's App Store and Google's Play, to drive downloads of our mobile applications. In the future, Apple, Google or other operators of application marketplaces may make changes to their marketplaces which make access to our products and services more difficult or limit our use of data to provide targeted advertising. We also depend in part on Internet search engines, such as Google, Apple Spotlight, Bing and Yahoo, to drive traffic to our website. For example, when a user types an inquiry into a search engine, we rely on a high organic search result ranking of our webpages in these search results to refer the user to our website. However, our ability to maintain high organic search result rankings is not within our control. Our competitors' search engine optimization, or SEO, efforts may result in their websites receiving a higher search result page ranking than ours, or Internet search engines could revise their methodologies in a way that would adversely affect our search result rankings. If internet search engines modify their search algorithms in ways that are detrimental to us, or if our competitors' SEO efforts are more successful than ours, the growth in our user base could slow. Our website has experienced fluctuations in search result rankings in the past, and we anticipate similar fluctuations in the future. Any reduction in the number of users directed to our mobile applications or website through application marketplaces and search engines could harm our business and operating results.

Users increasingly access our products and services through mobile and alternative devices, and we need to continue to promote the adoption of our mobile applications, and our business and operating results may be harmed if we are unable to do so.

In the three months ended December 31, 2018, 93% of our advertising revenue was generated from mobile devices. Since we generate a majority of our advertising revenue through users on mobile devices, we must continue to drive adoption of our mobile applications. However, in emerging markets like India and Pakistan, a significant portion of users use feature phones and communicate via SMS messaging, both of which have limited functionality and neither of which may be able to take full advantage of our products and services offered on smartphone or our website or desktop applications. In addition, mobile users frequently change or upgrade their mobile devices. Our business and operating results may be harmed if our users do not install our mobile application when they change or upgrade their mobile device. Although we generate the majority of our advertising revenue from ad engagements on mobile devices, certain of our products and services, including Promoted Trends and Promoted Accounts, receive less prominence on our mobile applications than they do on our desktop applications. This has in the past reduced, and may in the future continue to reduce, the amount of revenue we are able to generate from these products and services as users increasingly access our products and services through mobile and alternative devices. In addition, as new devices and platforms are continually being released, users may consume content in a manner that is more difficult to monetize. If we are unable to develop products and services that are compatible with new devices and platforms, or if we are unable to drive continued adoption of our mobile applications, our business and operating results may be harmed.

Acquisitions, divestitures and investments could disrupt our business and harm our financial condition and operating results.

Our success will depend, in part, on our ability to expand our products, product features and services, and grow our business in response to changing technologies, user and advertiser demands, and competitive pressures. In some circumstances, we may determine to do so through the acquisition of complementary businesses and technologies rather than through internal development, including, for example, our acquisitions of Periscope, a live-streaming video mobile application, and MoPub, a mobile-focused advertising exchange. The identification of suitable acquisition candidates can be difficult, time-consuming and costly, and we may not be able to successfully complete identified acquisitions. The risks we face in connection with acquisitions include:

- diversion of management time and focus from operating our business to addressing acquisition integration challenges;
- retention of key employees from the acquired company;
- cultural challenges associated with integrating employees from the acquired company into our organization;
- integration of the acquired company’s accounting, management information, human resources and other administrative systems and processes;

- the need to implement or improve controls, procedures, and policies at a business that prior to the acquisition may have lacked effective controls, procedures and policies;
- liability for activities of the acquired company before the acquisition, including intellectual property infringement claims, violations of laws, commercial disputes, tax liabilities and other known and unknown liabilities;
- unanticipated write-offs or charges; and
- litigation or other claims in connection with the acquired company, including claims from terminated employees, users, former stockholders or other third parties.

Our failure to address these risks or other problems encountered in connection with our past or future acquisitions and investments could cause us to fail to realize the anticipated benefits of these acquisitions or investments, cause us to incur unanticipated liabilities, and harm our business generally. Future acquisitions could also result in dilutive issuances of our equity securities, the incurrence of debt, contingent liabilities, amortization expenses, incremental operating expenses or the impairment of goodwill, any of which could harm our financial condition or operating results.

We also make investments in privately-held companies in furtherance of our strategic objectives. We may not realize a return and may recognize a loss on such investments. Many of the instruments in which we invest are non-marketable at the time of our initial investment. Companies in which we invest range from early-stage companies still defining their strategic direction to more mature companies with established revenue streams and business models. The success of our investment in any company is typically dependent on the availability to the company of additional funding on favorable terms, or a liquidity event, such as a public offering or acquisition. If any of the companies in which we invest decrease in value, we could lose all or part of our investment. For example, in the year ended December 31, 2017, we recorded a $62.4 million impairment charge relating to an investment in a privately-held company.

In certain cases, we have also divested or stopped investing in certain products, including products that we acquired. For instance, in January 2017, we divested certain assets related to our Fabric platform. In 2017, we also deprecated certain of our revenue products, including TellApart, which was acquired in 2015. In these cases, we have needed to and may, in the future, need to restructure operations, terminate employees and/or incur other expenses. We may not realize the expected benefits and cost savings of these actions and our results may be harmed.

If we fail to maintain an effective system of disclosure controls and internal control over financial reporting, our ability to produce timely and accurate financial statements or comply with applicable regulations could be impaired.

As a public company, we are subject to the reporting requirements of the Securities Exchange Act of 1934, as amended, or the Exchange Act, the Sarbanes-Oxley Act of 2002, as amended, or the Sarbanes-Oxley Act, and the listing standards of the New York Stock Exchange. The Sarbanes-Oxley Act requires, among other things, that we maintain effective disclosure controls and procedures and internal control over financial reporting. In order to maintain and improve the effectiveness of our disclosure controls and procedures and internal control over financial reporting, we have expended, and anticipate that we will continue to expend, significant resources, including accounting-related costs and significant management oversight.

Any failure to develop or maintain effective controls, or any difficulties encountered in their implementation or improvement, could cause us to be subject to one or more investigations or enforcement actions by state or federal regulatory agencies, stockholder lawsuits or other adverse actions requiring us to incur defense costs, pay fines, settlements or judgments. Any such failures could also cause investors to lose confidence in our reported financial and other information, which would likely have a negative effect on the trading price of our common stock. In addition, if we are unable to continue to meet these requirements, we may not be able to remain listed on the New York Stock Exchange.

If currency exchange rates fluctuate substantially in the future, our operating results, which are reported in U.S. dollars, could be adversely affected.

Our international operations expose us to the effects of fluctuations in currency exchange rates. We incur expenses for employee compensation and other operating expenses at our international locations in the local currency, and accept payment from advertisers or data partners in currencies other than the U.S. dollar. Since we conduct business in currencies other than U.S. dollars but report our operating results in U.S. dollars, we face exposure to fluctuations in currency exchange rates. While we enter into foreign currency forward contracts with financial institutions to reduce the risk that our earnings may be adversely affected by the impact of exchange rate fluctuations on monetary assets or liabilities denominated in currencies other than the functional currency of a subsidiary, exchange rate fluctuations between the U.S. dollar and other currencies could have a material impact on our operating results.

We may not have sufficient cash on hand or the ability to raise the funds necessary for cash settlement upon conversion of our convertible senior notes, to repurchase such notes for cash upon a fundamental change, or repay the Notes at their maturity, and our future debt may contain limitations on our ability to pay cash upon conversion or repurchase of such notes.

In 2014, we issued $935.0 million in aggregate principal amount of 0.25% convertible senior notes due 2019, or the 2019 Notes, and $954.0 million in aggregate principal amount of 1.00% convertible senior notes due 2021, or the 2021 Notes, in private placements to qualified institutional buyers. In June 2018, we issued an additional $1.15 billion in aggregate principal amount of 0.25% convertible senior notes due 2024, which we refer to as the Notes when taken together with the 2019 Notes and the 2021 Notes, in a private placement to qualified institutional buyers. As of December 31, 2018, we had a total par value of $3.04 billion of outstanding Notes.

Holders of the Notes will have the right under the relevant indenture governing the Notes to require us to repurchase all or a portion of their Notes upon the occurrence of a fundamental change before the relevant maturity date, in each case at a repurchase price equal to 100% of the principal amount of the respective services of Notes, plus accrued and unpaid interest, if any, to the fundamental change repurchase date. In addition, upon conversion of the Notes, unless we elect to deliver solely shares of our common stock to settle such conversion (other than paying cash in lieu of delivering any fractional shares), we will be required to make cash payments in respect of the Notes being converted. Moreover, we will be required to repay the Notes in cash at their maturity, unless earlier converted or repurchased. However, we may not have sufficient available cash on hand or be able to obtain financing at the time we are required to make cash settlement upon conversion of the Notes, repurchase the Notes upon a fundamental change, or repay the Notes at their maturity. In addition, our ability to repurchase the Notes or pay cash due upon conversions of the Notes may be limited by law, regulatory authority or agreements governing our future indebtedness.

Our ability to refinance the Notes, make cash payments in connection with conversions of the Notes, repurchase the Notes in the event of a fundamental change, or repay the Notes at their maturity will depend on market conditions and our future performance, which is subject to economic, financial, competitive and other factors beyond our control. We also may not use the cash we have raised through the issuance of the Notes in an optimally productive and profitable manner. Since inception we have incurred significant operating losses and we historically had not been cash flow positive and may not be in the future. As a result, we may not have enough available cash or be able to obtain financing on commercially reasonable terms or at all, at the time we are required to make repurchases of notes surrendered therefor or pay cash with respect to notes being converted or at their maturity and our level of indebtedness could adversely affect our future operations by increasing our vulnerability to adverse changes in general economic and industry conditions and by limiting or prohibiting our ability to obtain additional financing for future capital expenditures, acquisitions and general corporate and other purposes. In addition, if we are unable to make cash payments upon conversion of the Notes we would be required to issue significant amounts of our common stock, which would be dilutive to existing stockholders. If we do not have sufficient cash to repurchase the Notes following a fundamental change or repay the Notes at their maturity, we would be in default under the terms of the Notes, which could seriously harm our business. In addition, the terms of the Notes do not limit the amount of future indebtedness we may incur. If we incur significantly more debt, this could intensify the risks described above.

Our business is subject to the risks of earthquakes, fire, power outages, floods and other catastrophic events, and to interruption by man-made problems such as terrorism.

A significant natural disaster, such as an earthquake, fire, flood or significant power outage could have a material adverse impact on our business, operating results, and financial condition. Our headquarters and certain of our co-located data center facilities are located in the San Francisco Bay Area, a region known for seismic activity. Despite any precautions we may take, the occurrence of a natural disaster or other unanticipated problems at our data centers could result in lengthy interruptions in our services. In addition, acts of terrorism and other geo-political unrest could cause disruptions in our business. All of the aforementioned risks may be further increased if our disaster recovery plans prove to be inadequate. We have implemented a disaster recovery program, which allows us to move production to a back-up data center in the event of a catastrophe. Although this program is functional, we do not currently serve network traffic equally from each data center, so if our primary data center shuts down, there will be a period of time that our products or services, or certain of our products or services, will remain inaccessible to our users or our users may experience severe issues accessing our products and services.

We do not carry business interruption insurance sufficient to compensate us for the potentially significant losses, including the potential harm to our business that may result from interruptions in our ability to provide our products and services.

We may have exposure to greater than anticipated tax liabilities, which could adversely impact our operating results.

Our income tax obligations are based in part on our corporate operating structure, including the manner in which we develop, value and use our intellectual property and the scope of our international operations. The tax laws applicable to our international business activities, including the laws of the United States and other jurisdictions, are subject to interpretation. The taxing authorities of the jurisdictions in which we operate may challenge our methodologies for valuing developed technology (or other intangible assets) or intercompany arrangements, which could increase our worldwide effective tax rate and harm our financial condition and operating results. On October 5, 2015, the Organization for Economic Cooperation and Development (OECD), an international association of 34 countries, including the U.S., Ireland, and UK, released the final reports from its Base Erosion and Profit Shifting (BEPS) Action Plans. The BEPS recommendations covered a number of issues, including country-by-country reporting, permanent establishment rules, transfer pricing rules and tax treaties. Future tax reform resulting from this development may result in changes to long-standing tax principles, which could adversely affect our effective tax rate or result in higher cash tax liabilities. We are subject to review and audit by U.S. federal and state and foreign tax authorities. Tax authorities may disagree with certain positions we have taken and any adverse outcome of such a review or audit could have a negative effect on our financial position and operating results. In addition, our future income taxes could be adversely affected by earnings being lower than anticipated in jurisdictions that have lower statutory tax rates and higher than anticipated in jurisdictions that have higher statutory tax rates, by changes in the valuation of our deferred tax assets and liabilities, or by changes in tax laws, regulations or accounting principles, as well as certain discrete items. Furthermore, changes to the taxation of undistributed foreign earnings could change our future intentions regarding reinvestment of such earnings. Greater than anticipated tax expenses, or disputes with tax authorities, could adversely impact our operating results. In addition, many countries in Europe, as well as a number of other countries and organizations, have recently proposed changes to tax laws regarding digital services that could significantly increase our tax obligations in many countries where we do business or require us to change the manner in which we operate our business.

On August 7, 2018, the Ninth Circuit Court of Appeals withdrew its July 24, 2018 opinion in Altera Corp. v. Commissioner which required related parties in an intercompany cost-sharing arrangement to share expenses related to share-based compensation and reversed the prior decision of the United States Tax Court. We will continue to monitor the potential effects of any future developments in this case and related matters. We could be negatively impacted by an adverse ruling in the case.

Uncertainties in the interpretation and application of the 2017 Tax Cuts and Jobs Act could materially affect our tax obligations and effective tax rate.

The 2017 Tax Cuts and Jobs Act (the "Tax Act") significantly affected U.S. tax law by changing how U.S. income tax is assessed on multinational corporations. The Tax Act requires complex computations not previously provided for in U.S. tax law and the U.S. Department of Treasury has issued and will continue to issue regulations and interpretive guidance that may significantly impact how we will apply the law and impact our results of operations. As additional regulatory and interpretive guidance is issued, we may refine our analysis and make adjustments that differ from amounts initially recorded, which could materially affect our tax obligations and effective tax rate.

If our goodwill or intangible assets become impaired, we may be required to record a significant charge to earnings.

Under generally accepted accounting principles in the United States, or GAAP, we review our intangible assets for impairment when events or changes in circumstances indicate the carrying value may not be recoverable. Goodwill is required to be tested for impairment at least annually. As of December 31, 2018, we had recorded a total of $1.27 billion of goodwill and intangible assets. An adverse change in market conditions or financial results, particularly if such change has the effect of changing one of our critical assumptions or estimates, could result in a change to the estimation of fair value that could result in an impairment charge to our goodwill or intangible assets. Any such material charges may have a material negative impact on our operating results.

Our ability to use our net operating loss carryforwards and certain other tax attributes may be limited.

As of December 31, 2018, we had U.S. federal net operating loss carryforwards of approximately $2.85 billion and state net operating loss carryforwards of approximately $1.30 billion. As of December 31, 2018, we had federal R&D credits of $300.4 million and state credits of $236.2 million. Under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended, or the Code, if a corporation undergoes an "ownership change," the corporation's ability to use its pre-change net operating loss carryforwards and other pre-change tax attributes, such as research tax credits, to offset its post-change income and taxes may be limited. In general, an "ownership change" occurs if there is a cumulative change in our ownership by "5% shareholders" that exceeds 50 percentage points over a rolling three-year period. Similar rules may apply under state tax laws. In the event that it is determined that we have in the past experienced an ownership change, or if we experience one or more ownership changes as a result of future transactions in our stock, then we may be limited in our ability to use our net operating loss carryforwards and other tax assets to reduce taxes owed on the net taxable income that we earn. Any such limitations on the ability to use our net operating loss carryforwards and other tax assets could adversely impact our business, financial condition and operating results.

We may require additional capital to support our operations or the growth of our business, and we cannot be certain that this capital will be available on reasonable terms when required, or at all.

From time to time, we may need additional financing to operate or grow our business. Our ability to obtain additional financing, if and when required, will depend on investor and lender demand, our operating performance, the condition of the capital markets and other factors, and we cannot assure you that additional financing will be available to us on favorable terms when required, or at all. If we raise additional funds through the issuance of equity, equity-linked or debt securities, those securities may have rights, preferences or privileges senior to the rights of our common stock, and our existing stockholders may experience dilution. 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 the operation or growth of our business could be significantly impaired and our operating results may be harmed.

Risks Related to Ownership of Our Common Stock

Anti-takeover provisions contained in our amended and restated certificate of incorporation and amended and restated bylaws, as well as provisions of Delaware law, could impair a takeover attempt.

Our amended and restated certificate of incorporation, amended and restated bylaws and Delaware law contain provisions which could have the effect of rendering more difficult, delaying, or preventing an acquisition deemed undesirable by our board of directors. Among other things, our amended and restated certificate of incorporation and amended and restated bylaws include provisions:

- creating a classified board of directors whose members serve staggered three-year terms;
- authorizing “blank check” preferred stock, which could be issued by our board of directors without stockholder approval and may contain voting, liquidation, dividend and other rights superior to our common stock;
- limiting the liability of, and providing indemnification to, our directors and officers;
- limiting the ability of our stockholders to call and bring business before special meetings;
- requiring advance notice of stockholder proposals for business to be conducted at meetings of our stockholders and for nominations of candidates for election to our board of directors; and
- controlling the procedures for the conduct and scheduling of stockholder meetings.

These provisions, alone or together, could delay or prevent hostile takeovers and changes in control or changes in our management.

As a Delaware corporation, we are also subject to provisions of Delaware law, including Section 203 of the Delaware General Corporation law, which prevents certain stockholders holding more than 15% of our outstanding common stock from engaging in certain business combinations without approval of the holders of at least two-thirds of our outstanding common stock not held by such 15% or greater stockholder.

Any provision of our amended and restated certificate of incorporation, amended and restated bylaws or Delaware law that has the effect of delaying, preventing or deterring a change in control could limit the opportunity for our stockholders to receive a premium for their shares of our common stock, and could also affect the price that some investors are willing to pay for our common stock.

The market price of our common stock has been and will likely continue to be volatile, and you could lose all or part of your investment.

The market price of our common stock has been and may continue to be highly volatile in response to various factors, some of which are beyond our control. From January 1, 2017 to December 31, 2018, the reported high and low sales prices of our common stock has ranged from $47.79 to $14.12. In addition to the factors discussed in this “Risk Factors” section and elsewhere in this Annual Report on Form 10-K, factors that could cause fluctuations in the market price of our common stock include the following:

- price and volume fluctuations in the overall stock market from time to time;
- volatility in the market prices and trading volumes of technology stocks;

- changes in operating performance and stock market valuations of other technology companies generally, or those in our industry in particular;
- sales of shares of our common stock by us or our stockholders;
- rumors and market speculation involving us or other companies in our industry;
- failure of securities analysts to maintain coverage of us, changes in financial estimates by securities analysts who follow our company, or our failure to meet these estimates or the expectations of investors;
- the financial or non-financial metric projections we may provide to the public, any changes in those projections or our failure to meet those projections;
- announcements by us or our competitors of new products or services;
- the public's reaction to our press releases, other public announcements and filings with the SEC;
- actual or anticipated changes in our operating results or fluctuations in our operating results;
- actual or anticipated developments in our business, our competitors' businesses or the competitive landscape generally;
- our issuance of shares of our common stock, whether in connection with an acquisition or upon conversion of some or all of our outstanding Notes;
- litigation or regulatory action involving us, our industry or both, or investigations by regulators into our operations or those of our competitors;
- developments or disputes concerning our intellectual property or other proprietary rights;
- announced or completed acquisitions of businesses or technologies by us or our competitors;
- new laws or regulations or new interpretations of existing laws or regulations applicable to our business;
- changes in accounting standards, policies, guidelines, interpretations or principles;
- any significant change in our management; and
- general economic conditions and slow or negative growth of our markets.

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. Any securities litigation can result in substantial costs and a diversion of our management's attention and resources. We are currently subject to securities litigation and may experience more such litigation following any future periods of volatility.

The note hedge and warrant transactions may affect the value of our common stock.

Concurrent with the issuance of the Notes, we entered into note hedge transactions with certain financial institutions, which we refer to as the option counterparties. The note hedge transactions are generally expected to reduce the potential dilution upon any conversion of the Notes and/or offset any cash payments we are required to make in excess of the principal amount of converted Notes, as the case may be. We also entered into warrant transactions with the option counterparties. However, the warrant transactions could separately have a dilutive effect to the extent that the market price of our common stock exceeds the applicable strike price of the warrants.

The option counterparties or their respective affiliates may modify their initial hedge positions by entering into or unwinding various derivatives contracts 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 Notes (and are likely to do so during any observation period related to a conversion of Notes or following any repurchase of Notes by us on any fundamental change repurchase date or otherwise). This activity could cause or avoid an increase or a decrease in the market price of our common stock.

In addition, if any such convertible note hedge and warrant transactions fail to become effective, the option counterparties or their respective affiliates may unwind their hedge positions with respect to our common stock, which could adversely affect the value of our common stock.

If securities or industry analysts cease publishing research or reports about us, our business or our market, or if they change their recommendations regarding our common stock adversely, the price of our common stock and trading volume could decline.

The trading market for our common stock is influenced, to some extent, by the research and reports that securities or industry analysts publish about us, our business, our industry, our market or our competitors. If any of the analysts who cover us change their recommendation regarding our common stock adversely, or provide more favorable relative recommendations about our competitors, the price of our common stock would likely decline. If any analysts who cover us were to cease coverage of our company or fail to regularly publish reports on us, we could lose visibility in the financial markets, which in turn could cause the price of our common stock or trading volume to decline.

We do not expect to declare any dividends in the foreseeable future.

We do not anticipate declaring any cash dividends to holders of our common stock in the foreseeable future. In addition, our credit facility contains restrictions on payments including payments of cash dividends. Consequently, investors may need to rely on sales of our common stock after price appreciation, which may never occur, as the only way to realize any future gains on their investment.

Item 1B. UNRESOLVED STAFF COMMENTS

None.

Item 2. PROPERTIES

Facilities

As of December 31, 2018, we leased office facilities around the world totaling approximately 1,561,000 square feet, including approximately 749,000 square feet for our corporate headquarters in San Francisco, California. We also lease data center facilities in the United States pursuant to various lease agreements and co-location arrangements with data center operators. We believe our facilities are sufficient for our current needs.

Item 3. LEGAL PROCEEDINGS

Legal Proceedings

Beginning in September 2016, multiple putative class actions and derivative actions were filed in state and federal courts in the United States against Twitter, Twitter’s directors, and/or certain former officers alleging false and misleading statements in violation of securities laws and breach of fiduciary duty. The putative class actions were consolidated in the U.S. District Court for the Northern District of California. On October 16, 2017, the court granted in part and denied in part the Company’s motion to dismiss. On July 17, 2018, the court granted plaintiffs' motion for class certification in the consolidated securities action. The Company disputes the claims and continues to defend the lawsuits vigorously.

We are also currently involved in, and may in the future be involved in, legal proceedings, claims, investigations, and government inquiries arising in the ordinary course of business. These proceedings, which include both individual and class action litigation and administrative proceedings, have included, but are not limited to matters involving content on the platform, intellectual property, privacy, securities, employment and contractual rights. Legal risk may be enhanced in jurisdictions outside the United States where our protection from liability for content published on our platform by third parties may be unclear and where we may be less protected under local laws than we are in the United States. Future litigation may be necessary, among other things, to defend ourselves, and our users or to establish our rights.

Although the results of the legal proceedings, claims, investigations, and government inquiries in which we are involved cannot be predicted with certainty, we do not believe that there is a reasonable possibility that the final outcome of these matters will have a material adverse effect on our business, financial condition, operating results, or prospects. However, the final results of any current or future proceeding cannot be predicted with certainty, and until there is final resolution on any such matter that we may be required to accrue for, we may be exposed to loss in excess of the amount accrued. Regardless of the outcome, litigation can have an adverse impact on us because of defense and settlement costs, diversion of management resources, and other factors.

Item 4. MINE SAFETY DISCLOSURE

Not applicable.

PART II

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

Market Information for Common Stock

Our common stock has been listed on the New York Stock Exchange under the symbol "TWTR" since November 7, 2013. Prior to that date, there was no public trading market for our common stock.

Holders of Record

As of February 7, 2019, there were 876 holders of record of our common stock. Because many of our shares of common stock are held by brokers and other institutions on behalf of stockholders, we are unable to estimate the total number of stockholders represented by these record holders.

Dividend Policy

We have never declared or paid any cash dividends on our capital stock. We intend to retain any future earnings and do not expect to pay any dividends in the foreseeable future. Any future determination to declare cash dividends will be made at the discretion of our board of directors, subject to applicable laws, and will depend on a number of factors, including our financial condition, results of operations, capital requirements, contractual restrictions, general business conditions and other factors that our board of directors may deem relevant. In addition, the credit facility contains restrictions on payments including cash payments of dividends.

Unregistered Sales of Equity Securities

During 2018, we issued a total of 773,950 shares of our common stock in connection with the acquisition of one company.

The foregoing transaction did not involve any underwriters, any underwriting discounts or commissions, or any public offering. We believe the offers, sales, and issuances of the above securities were exempt from registration under the Securities Act of 1933, as amended (the "Act") by virtue of Section 4(a)(2) of the Act, because the issuance of securities to the recipients did not involve a public offering. The recipients of the securities in this transaction represented their intentions to acquire the securities for investment only and not with a view to or for sale in connection with any distribution thereof, and appropriate legends were placed upon the stock certificates issued in these transactions. All recipients had adequate access, through their relationships with us or otherwise, to information about us. The issuances of these securities were made without any general solicitation or advertising.

Performance Graph

This performance graph shall not be deemed "soliciting material" or to be "filed" with the SEC for purposes of Section 18 of the Securities Exchange Act of 1934, as amended (Exchange Act), or otherwise subject to the liabilities under that

Section, and shall not be deemed to be incorporated by reference into any filing of Twitter, Inc. under the Securities Act of 1933, as amended, or the Exchange Act.

The following graph compares the cumulative total return to stockholders on our common stock relative to the cumulative total returns of the Standard & Poor's 500 Index, or S&P 500, and the Dow Jones Internet Composite Index, or DJ Internet Composite. An investment of $100 (with reinvestment of all dividends) is assumed to have been made in our common stock and in each index on November 7, 2013, the date our common stock began trading on the NYSE, and its relative performance is tracked through December 31, 2018. The returns shown are based on historical results and are not intended to suggest future performance.

Item 6. SELECTED FINANCIAL DATA

The following selected historical consolidated financial data should be read in conjunction with Part II, Item 7, “Management’s Discussion and Analysis of Financial Condition and Results of Operations”, our consolidated financial statements and the related notes included in Item 8, “Financial Statements and Supplementary Data” of this Annual Report on Form 10-K.

The consolidated statements of operations data for the years ended December 31, 2018, 2017 and 2016 and the consolidated balance sheet data as of December 31, 2018 and 2017 are derived from our audited consolidated financial statements included in Part II, Item 8, “Financial Statements and Supplementary Data” in this Annual Report on Form 10 K. The consolidated statements of operations data for the years ended December 31, 2015 and 2014 and the consolidated balance sheet data as of December 31, 2016, 2015 and 2014 are derived from our audited consolidated financial statements not included in this Annual Report on Form 10-K. Our historical results are not necessarily indicative of the results that may be expected in the future.

	Year Ended December 31,				
	2018	2017	2016	2015	2014
	(In thousands, except per share data)				
Consolidated Statement of Operations Data:					
Revenue[1]	$3,042,359	$2,443,299	$2,529,619	$2,218,032	$1,403,002
Costs and expenses[2]					
Cost of revenue	964,997	861,242	932,240	729,256	446,309
Research and development	553,858	542,010	713,482	806,648	691,543
Sales and marketing	771,361	717,419	957,829	871,491	614,110
General and administrative	298,818	283,888	293,276	260,673	189,906
Total costs and expenses	2,589,034	2,404,559	2,896,827	2,668,068	1,941,868
Income (loss) from operations	453,325	38,740	(367,208)	(450,036)	(538,866)
Interest expense	(132,606)	(105,237)	(99,968)	(98,178)	(35,918)
Interest income	111,221	44,383	24,277	9,073	1,933
Other income (expense), net	(8,396)	(73,304)	2,065	5,836	(5,500)
Income (loss) before income taxes	423,544	(95,418)	(440,834)	(533,305)	(578,351)
Provision (benefit) for income taxes[3]	(782,052)	12,645	16,039	(12,274)	(531)
Net income (loss)	$1,205,596	$(108,063)	$(456,873)	$(521,031)	$(577,820)
Net income (loss) per share attributable to common stockholders:					
Basic	$1.60	$(0.15)	$(0.65)	$(0.79)	$(0.96)
Diluted	$1.56	$(0.15)	$(0.65)	$(0.79)	$(0.96)
Weighted-average shares used to compute net income (loss) per share attributable to common stockholders:					
Basic	754,326	732,702	702,135	662,424	604,990
Diluted	772,686	732,702	702,135	662,424	604,990
Other Financial Information:[4]					
Adjusted EBITDA	$1,200,796	$862,986	$751,493	$557,807	$300,896
Non-GAAP net income	$663,804	$328,859	$264,406	$180,486	$68,438

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(1) We adopted the new revenue standard on January 1, 2018 using the modified retrospective method. Revenue for the year ended December 31, 2018 was not materially impacted by the application of the new revenue standard.

(2) Costs and expenses include stock-based compensation expense as follows:

	Year Ended December 31,				
	2018	2017	2016	2015	2014
	(In thousands)				
Cost of revenue	$17,289	$23,849	$29,502	$40,705	$50,536
Research and development	183,799	240,833	335,498	401,537	360,726
Sales and marketing	71,305	94,135	160,935	156,904	157,263
General and administrative	53,835	74,989	89,298	82,972	63,072
Total stock-based compensation	$326,228	$433,806	$615,233	$682,118	$631,597

(3) Provision (benefit) for income taxes includes the impact of the Tax Act. Refer to Note 14 of the Notes to Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K for further information. In the year ended December 31, 2018, we recorded a net benefit to tax expense of $845.1 million associated with the release of the valuation allowance related to Brazil and most of the United States federal and all states deferred tax assets with the exception of California and Massachusetts.

(4) See the section titled “Non-GAAP Financial Measures” below for additional information and a reconciliation of net income (loss) to Adjusted EBITDA and net income (loss) to non-GAAP net income.

	As of December 31,				
	2018	2017	2016	2015	2014
	(In thousands)				
Consolidated Balance Sheet Data:					
Cash and cash equivalents	$1,894,444	$1,638,413	$988,598	$911,471	$1,510,724
Short-term investments	4,314,957	2,764,689	2,785,981	2,583,877	2,111,154
Property and equipment, net	885,078	773,715	783,901	735,299	557,019
Total assets	10,162,572	7,412,477	6,870,365	6,442,439	5,583,082
Convertible notes	2,628,250	1,627,460	1,538,967	1,455,095	1,376,020
Total liabilities	3,356,978	2,365,259	2,265,430	2,074,392	1,956,679
Total stockholders' equity	6,805,594	5,047,218	4,604,935	4,368,047	3,626,403

Non-GAAP Financial Measures

To supplement our consolidated financial statements presented in accordance with generally accepted accounting principles in the United States, or GAAP, we consider certain financial measures that are not prepared in accordance with GAAP, including Adjusted EBITDA, non-GAAP income before income taxes, non-GAAP provision for income taxes as it relates to the calculation of non-GAAP net income, and non-GAAP net income. These non-GAAP financial measures are not based on any standardized methodology prescribed by GAAP and are not necessarily comparable to similarly-titled measures presented by other companies.

Adjusted EBITDA

We define Adjusted EBITDA as net income (loss) adjusted to exclude stock-based compensation expense, depreciation and amortization expense, interest and other expenses, net, provision (benefit) for income taxes, restructuring charges and one-time nonrecurring gain, if any.

The following table presents a reconciliation of net income (loss) to Adjusted EBITDA for each of the periods indicated:

	Year Ended December 31,				
	2018	2017	2016	2015	2014
	(in thousands)				
Reconciliation of Net Income (Loss) to Adjusted EBITDA					
Net income (loss)	$1,205,596	$(108,063)	$(456,873)	$(521,031)	$(577,820)
Stock-based compensation expense	326,228	433,806	615,233	682,118	631,597
Depreciation and amortization expense	425,498	395,867	402,172	312,823	208,165
Interest and other expense, net	29,781	134,158	73,626	83,269	39,485
Provision (benefit) for income taxes	(782,052)	12,645	16,039	(12,274)	(531)
Restructuring charges and one-time nonrecurring gain	(4,255)	(5,427)	101,296	12,902	—
Adjusted EBITDA	$1,200,796	$862,986	$751,493	$557,807	$300,896

Non-GAAP Net Income

We define non-GAAP net income as net income (loss) adjusted to exclude stock-based compensation expense, amortization of acquired intangible assets, non-cash interest expense related to convertible notes, non-cash expense related to acquisitions, impairment of investments in privately-held companies, restructuring charges and one-time nonrecurring gain, and adjustment to income tax expense based on the non-GAAP measure of profitability using our blended U.S. statutory tax rate, which was 24% for 2018 as a result of the Tax Act and 37% for all other historical periods presented.

Non-GAAP Income before Income Taxes. We define non-GAAP income before income taxes as income (loss) before income taxes adjusted to exclude stock-based compensation expense, amortization of acquired intangible assets, non-cash interest expense related to convertible notes, non-cash expense related to acquisitions, impairment of investments in privately-held companies, and restructuring charges and one-time nonrecurring gain.

Non-GAAP Provision for Income Taxes. We define non-GAAP provision for income taxes as the current and deferred income tax expense commensurate with the non-GAAP measure of profitability using our blended U.S. statutory tax rate.

The following table presents a reconciliation of net income (loss) to non-GAAP net income for each of the periods indicated:

	Year Ended December 31,				
	2018	2017	2016	2015	2014
	(in thousands)				
Reconciliation of Net Income (Loss) to Non-GAAP Net Income					
Net income (loss)	$1,205,596	$(108,063)	$(456,873)	$(521,031)	$(577,820)
Exclude: Provision (benefit) for income taxes	(782,052)	12,645	16,039	(12,274)	(531)
Income (loss) before income taxes	423,544	(95,418)	(440,834)	(533,305)	(578,351)
Stock-based compensation expense	326,228	433,806	615,233	682,118	631,597
Amortization of acquired intangible assets	18,984	46,537	69,338	54,659	36,563
Non-cash interest expense related to convertible notes	105,926	80,061	74,660	69,185	18,823
Non-cash expense related to acquisition	—	—	—	926	—
Impairment of investments in privately-held companies	3,000	62,439	—	—	—
Restructuring charges and one-time nonrecurring gain	(4,255)	(5,427)	101,296	12,902	—
Non-GAAP income before income taxes	873,427	521,998	419,693	286,485	108,632
Non-GAAP provision for income taxes	209,623	193,139	155,287	105,999	40,194
Non-GAAP net income	$663,804	$328,859	$264,406	$180,486	$68,438

We use non-GAAP financial measures of Adjusted EBITDA, non-GAAP income before income taxes, non-GAAP provision for income taxes, and non-GAAP net income in evaluating our operating results and for financial and operational decision-making purposes. We believe that Adjusted EBITDA, non-GAAP income before income taxes and non-GAAP net income help identify underlying trends in our business that could otherwise be masked by the effect of the expenses that we exclude in Adjusted EBITDA, non-GAAP income before income taxes and non-GAAP net income. We believe that Adjusted EBITDA, non-GAAP income before income taxes and non-GAAP net income provide useful information about our operating results, enhance the overall understanding of our past performance and future prospects and allow for greater transparency with respect to key metrics used by our management in its financial and operational decision-making. We also use these measures to establish budgets and operational goals for managing our business and evaluating our performance.

These non-GAAP financial measures should not be considered in isolation from, or as a substitute for, financial information prepared in accordance with GAAP. There are a number of limitations related to the use of these non-GAAP financial measures rather than net income (loss), which is the nearest GAAP equivalent of these financial measures. Some of these limitations are:

- Adjusted EBITDA, non-GAAP income before income taxes, non-GAAP provision for income taxes as it relates to the calculation of non-GAAP net income and non-GAAP net income exclude restructuring charges, one-time nonrecurring gain and certain recurring non-cash charges, such as stock-based compensation expense, amortization of acquired intangible assets, non-cash interest expense related to convertible notes and impairment of investments in privately-held companies;
- Stock-based compensation expense has been, and will continue to be for the foreseeable future, a significant recurring expense in our business and an important part of our compensation strategy;
- Adjusted EBITDA and non-GAAP income before income taxes do not reflect tax payments that reduce cash available to us;
- Non-GAAP net income reflects an estimate of taxes calculated in accordance with the SEC's Non-GAAP Financial Measures Compliance and Disclosure Interpretation, not actual taxes due or payable;
- Adjusted EBITDA excludes depreciation and amortization expense and although these are non-cash charges, the property and equipment being depreciated and amortized may have to be replaced in the future; and
- The expenses that we exclude in our calculation of these non-GAAP financial measures may differ from the expenses, if any, that our peer companies may exclude from similarly-titled non-GAAP measures when they report their results of operations.

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 in conjunction with the consolidated financial statements and related notes thereto included in Item 8 "Financial Statements and Supplementary Data" in this Annual Report on Form 10-K. This discussion contains forward-looking statements that involve risks and uncertainties. Our actual results could differ materially from those discussed below. Factors that could cause or contribute to such differences include, but are not limited to, those identified below and those discussed in the section titled "Risk Factors" included elsewhere in this Annual Report on Form 10-K.

FY 2018 Overview and Highlights

Total revenue was $3.04 billion, an increase of 25% compared to 2017.

- Advertising revenue totaled $2.62 billion, an increase of 24% compared to 2017.
- Data licensing and other revenue totaled $425.0 million, an increase of 27% compared to 2017.
- U.S. revenue totaled $1.64 billion, an increase of 16% compared to 2017.
- International revenue totaled $1.40 billion, an increase of 36% compared to 2017.
- Total ad engagements increased 55% year-over-year.
- Cost per engagement decreased 20% year-over-year.

Net income was $1.21 billion, compared to a net loss of $108.1 million in 2017.

Non-GAAP net income was $663.8 million, an increase of 102% compared to 2017.

Adjusted EBITDA was $1.20 billion, an increase of 39% compared to 2017.

Stock-based compensation for the year was $326.2 million, or 11% of revenue, representing a decrease of 25% compared to 2017.

Cash, cash equivalents and short-term investments in marketable securities totaled $6.21 billion as of December 31, 2018.

Average monetizable daily active users (mDAU) were 126 million for the three months ended December 31, 2018, an increase of 9% year-over-year.

Average monthly active users (MAU) were 321 million for the three months ended December 31, 2018, a decrease of 3% compared to the three months ended December 31, 2017.

Key Metrics

We review a number of metrics, including the following key metrics, to evaluate our business, measure our performance, identify trends affecting our business, formulate business plans and make strategic decisions. We believe that mDAU, and its related growth, are the best ways to measure our success against our objectives and to show the size of our audience and engagement going forward, so we will discontinue disclosing MAU after the first quarter of 2019.

Monetizable Daily Active Usage (monetizable DAU or mDAU). We define monetizable daily active usage or users (mDAU) as Twitter users who logged in and accessed Twitter on any given day through a client capable of displaying ads (e.g., Twitter.com or the Twitter App). Our definition and calculation of mDAU is the same as that of the DAU data presented since the first quarter of 2016. Additionally, our calculation of mDAU is not based on any standardized industry methodology and is not necessarily calculated in the same manner or comparable to similarly-titled measures presented by other companies. Average mDAU for a period represents the number of mDAU on each day of such period divided by the number of days for such period. Changes in mDAU are a measure of changes in the size of our daily logged in active user base. To calculate the year-over-year change in mDAU, we subtract the average mDAU for the three months ended in the previous year from the average mDAU for the same three months ended in the current year and divide the result by the average mDAU for the three months ended in the previous year.

In the three months ended December 31, 2018, we had 126 million average mDAUs, which represents an increase of 9% from the three months ended December 31, 2017. The increase was driven by a combination of organic growth, marketing, and product improvements. In the three months ended December 31, 2018, we had 27 million average mDAUs in the United States and 99 million average mDAUs in the rest of the world, which represent increases of 5% and 11%, respectively, from the three months ended December 31, 2017.

For additional information on how we calculate changes in mDAUs and factors that can affect this metric, see the section titled “Note Regarding Key Metrics.”

Monthly Active Users (MAUs). We define MAUs as Twitter users who logged in or were otherwise authenticated and accessed Twitter through our website, mobile website, desktop or mobile applications, SMS or registered third-party applications or websites in the 30-day period ending on the date of measurement. Average MAUs for a period represent the average of the MAUs at the end of each month during the period. MAUs are a measure of the size of our logged in or otherwise authenticated active user base. In the three months ended December 31, 2018, we had 321 million average MAUs, which represents a decrease of 3% from the three months ended December 31, 2017. MAU growth is historically seasonally weak in the fourth quarter. The decrease in average MAUs was driven by a number of factors, including product changes that reduced the number of email notifications sent, as well as decisions we have made to prioritize the health of the service and not to move to paid SMS carrier relationships in certain markets, and, to a lesser extent, changes we made to comply with the General Data Protection Regulation (GDPR). In the three months ended December 31, 2018, we had 66 million average MAUs in the United States and 255 million average MAUs in the rest of the world, which each represent decreases of 3%, from the three months ended December 31, 2017. For additional information on how we calculate MAUs and factors that can affect this metric, see the section titled “Note Regarding Key Metrics.” As we announced on February 7, 2019, mDAU will be the metric we use to show the size of our audience and engagement going forward, so we will discontinue disclosing MAU after the first quarter of 2019.

(1) Reported average Monthly Active Users reflects adjustments for approximately 1-2 million users per quarter of certain third-party applications that were included as Twitter MAUs that should not have been considered MAUs in certain prior periods. Daily Active Usage was not affected. Further details regarding the adjustment can be found in the section titled "Note About Our MAU Adjustment."

(2) In the three months ended March 31, 2018, we discovered that a software change made in the second quarter of 2017 resulted in a non-material overstatement of our historical MAU in 2017. The differences were between 30,000 and 400,000 in each period presented for total MAU. After rounding, the only impact to our prior disclosures was to reduce international MAU from 261 million to 260 million in the third quarter of 2017 due to a change of approximately 175,000 international MAUs.

Changes in Ad Engagements and Cost per Ad Engagement. We define an ad engagement as a user interaction with one of our pay-for-performance advertising products. Ad engagements with our advertising products are based on a user completing an objective set out by an advertiser such as expanding, Retweeting, liking or replying to a Promoted Tweet, viewing an embedded video, downloading or engaging with a promoted mobile application, clicking on a website link, signing up for marketing emails from advertisers, following the account that tweets a Promoted Tweet, or completing a transaction on an external website. We believe changes in ad engagements is one way to measure user engagement with our advertising products. We believe changes in cost per ad engagement is one way to measure demand.

In the three months ended December 31, 2018, ad engagements increased 33% from the three months ended December 31, 2017. The increase was driven by increased demand and improved clickthrough rates (CTR), which grew on a year-over-year basis across the majority of ad types as our ad prediction models and video ad product performance continues to improve. In the three months ended December 31, 2018, cost per ad engagement decreased 7% from the three months ended December 31, 2017. The decrease in cost per ad engagement reflects higher CTR from improved relevance, an ongoing shift to video ads, which carry higher CTR and lower CPE, and slight compression in like for like pricing. With improved CTR, advertisers are able to get the same amount of engagements (or more) at a lower (or similar) price.

Factors Affecting Our Future Performance

User Growth and Monetization. User growth trends reflected in the growth rate of mDAUs and monetization trends reflected in advertising engagements are key factors that affect our revenue. As our user base and the level of engagement of our users grow, we believe the potential to increase our revenue grows.

User Growth. We have generally experienced growth in our number of mDAU over the last several years. In general, a higher proportion of Internet users in the United States and Japan use Twitter than Internet users in other countries. Accordingly, in the future we expect our user growth rate in certain international markets to continue to be higher than our user growth rate in the United States. However, we expect to face challenges in entering some markets, such as China, where access to Twitter is blocked, as well as certain other countries that have intermittently restricted access to Twitter. Restrictions or limitations on access to Twitter may adversely impact our ability to increase the size of our user base and generate additional revenue in certain markets.

We intend to grow mDAU by building and shipping product changes more rapidly to make Twitter safer and investing in our core use case and in new product areas that further strengthen our unique position as the best and fastest place to see and talk about what’s happening in the world. Our mDAU growth rate has fluctuated over time, and it may slow or decline. To the extent our mDAU growth or growth rate slows or the absolute number of mDAU declines, our revenue growth will become dependent on our ability to increase levels of user engagement on Twitter and increasing revenue growth from third-party publishers’ websites and applications, data licensing and other offerings.

Monetization. There are many variables that impact the monetization of our platform, such as the number of users, our users' level of engagement with our platform, ad load (which is a function of the amount of advertising we choose to display), our users' engagement with our Promoted Products, advertiser demand and cost per ad engagement. Generally, we design our algorithms for our pay-for-performance Promoted Products on Twitter to optimize the overall user experience and the value we deliver to advertisers. Advertising revenue growth may be impacted by escalating competition for digital ad spending and the reevaluation of our revenue product feature portfolio, which could result in the de-emphasis of certain product features. Furthermore, we may see a decline in the number of advertisers on a year-over-year basis, which may also impact overall demand for our ads products. We have, and may in the future, increase ad load to the extent that we are able to continue to reach the right balance of advertiser value and the overall user experience. In order to improve monetization, we plan to increase the value of our advertising services by continuing to increase the size and engagement of our user base as well as improve our ability to target advertising to our users' interests and the ability of our advertisers to optimize their campaigns and measure the results of their campaigns.

Although the majority of the Promoted Products we sell to our advertisers are placed on Twitter, we have augmented our advertising revenue by selling products that we place on third-party publishers' websites, applications or other offerings. When we place ads off our owned and operated properties, we incur additional costs, particularly traffic acquisition costs, to fulfill our services to advertisers.

We intend to continue to increase the monetization of our platform by improving the targeting capabilities of our advertising services to enhance the value of our Promoted Products for advertisers, delivering differentiated products to advertisers, and developing new ad formats for advertisers.

Effectiveness of Our Advertising Services. Advertisers can use Twitter to communicate directly with their followers for free, but many choose to purchase our advertising services to reach a broader audience and further promote their brands, products and services. We believe that increasing the effectiveness of our Promoted Products for advertisers, as well as providing better measurement tools and improving creative capabilities, will increase the amount that advertisers spend with us. We aim to increase the value of our Promoted Products by increasing the size and engagement of our user base, improving our ability to target advertising to our users' interests and improving the ability of our advertisers to optimize their campaigns and measure the results of their campaigns. We may also develop new advertising products and services.

Investment in International Operations. We intend to strategically invest in our international operations in order to expand our user base and advertiser base and increase user engagement and monetization internationally. In the three months ended December 31, 2018, we had 99 million average mDAUs internationally compared to 27 million average mDAUs in the United States. In the three months ended December 31, 2018, we had 255 million average MAUs internationally compared to 66 million average MAUs in the United States. International growth of mDAUs has been faster than growth in the United States; however, we derive approximately half of our advertising revenue from advertisers in the United States.

We face challenges in increasing our advertising revenue internationally, including local competition, differences in advertiser demand, differences in the digital advertising market and conventions, and differences in the manner in which Twitter is accessed and used internationally. We face competition from well-established competitors in certain international markets. In addition, certain international markets are not as familiar with digital advertising in general, or with new forms of digital advertising, such as our Promoted Products. In these jurisdictions we are investing to educate advertisers about the benefits of our advertising services. However, we expect that it may require a significant investment of time and resources to educate advertisers in many international markets. We also face challenges in providing certain advertising products, features or analytics in certain international markets, such as the European Union, due to government regulation.

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Competition. We face competition for users and advertisers. We compete against many companies to attract and engage users and for advertiser spend, including companies with greater financial resources and substantially larger user bases which offer a variety of Internet and mobile device-based products, services and content. In recent years there has been a significant number of acquisitions and consolidation activity by and among our actual and potential competitors. We must compete effectively for users and advertisers in order to grow our business and increase our revenue. We believe that our ability to compete effectively for users depends upon a number of factors, including the quality of our products and services and the actual or perceived return our advertisers receive on their investment in our products and services. Our ability to compete effectively for advertisers also depends upon a number of factors, including our ability to offer attractive advertising products with unique targeting capabilities, the size of our active user base, and our ability to have the most valuable audience when they are most receptive. We have seen competition for digital ad spending and expect this trend to continue. In addition, many advertisers, particularly branded advertisers use marketing mix analyses to determine how to allocate their advertising budgets on an annual or bi-annual basis. As a result, we need to demonstrate to those advertisers during the appropriate time period that we provide a better return on investment than our competitors do in order to secure, increase or sustain our share of the advertising budget allocated for a significant portion of the year until the next budget cycle. We intend to continue to invest in research and development to improve our products and services for users and advertisers and to grow our active user base in order to address the competitive challenges in our industry. As part of our strategy to improve our products and services, we may acquire other companies to add engineering talent or complementary products and technologies.

Investment in Infrastructure. We strive to optimize the capacity and enhance the capability and reliability of our infrastructure. Our infrastructure is critical to providing users, platform partners, advertisers and data partners access to our platform, particularly during major planned and unplanned events, such as elections, sporting events or natural disasters, when activity on our platform increases dramatically. As our user base and the activity on our platform grow, we expect that investments and expenses associated with our infrastructure will continue to grow. These investments and expenses include the expansion and improvement of our data center operations and related operating costs, additional servers and networking equipment to increase the capacity of our infrastructure, increased bandwidth costs, and costs to secure our customers' data.

Products and Services Innovation. Our ability to increase the size and engagement of our user base, attract advertisers and increase our revenue will depend, in part, on our ability to improve existing products and services and to successfully develop or acquire new products and services. We will continue to invest in revenue products as we work to improve our ads platform and ad formats to help our ad partners launch new products and services and connect with what's happening on Twitter. We plan to continue to make significant investments in research and development and, from time to time, we may acquire companies to enhance our products, services and technical capabilities. In addition, we continue to invest in health as we continue our work to help people find credible information on our service and feel safe participating in the conversation on Twitter.

Investment in Talent. We intend to invest in hiring key engineering roles and retaining talented employees to grow our business. We have seen reduced levels of attrition in 2018, but we need to continue to focus on hiring and employee retention to be successful. We have also made, and intend to continue to make, acquisitions that add engineers, designers, product managers and other personnel with specific technology expertise. In addition, we must retain our high-performing personnel in order to continue to develop, sell and market our products and services and manage our business.

Seasonality. Advertising spending is traditionally strongest in the fourth quarter of each year. Historically, this seasonality in advertising spending has affected our quarterly results, with higher sequential advertising revenue growth from the third quarter to the fourth quarter compared to sequential advertising revenue growth from the fourth quarter to the subsequent first quarter. For example, our advertising revenue increased 17%, 28% and 22% between the third and fourth quarters of 2016, 2017 and 2018, respectively, while advertising revenue for the first quarter of 2017 and 2018 decreased 26% and 11% compared to the fourth quarter of 2016 and 2017, respectively.

Stock-Based Compensation Expense. We have historically utilized, and intend to continue to utilize, various forms of stock-based awards in order to hire and retain talented employees. During the years ended December 31, 2018 and 2017, we recognized $326.2 million and $433.8 million of expense related to stock-based compensation, respectively. As of December 31, 2018, we had unrecognized stock-based compensation expense of approximately $715.0 million related to outstanding equity awards, which we expect to recognize over a weighted-average period of approximately three years. The stock-based compensation expenses related to our outstanding equity awards have a significant impact on the amount of net income we generate on a GAAP basis. We made significant progress in reducing our annual stock-based compensation expense on both an absolute basis and as a percentage of revenue, down to 11% in 2018, from 18% and 24% in 2017 and 2016, respectively. We remain committed to maintaining stock-based compensation as a percentage of revenue in line with our peers.

Results of Operations

The following tables set forth our consolidated statement of operations data for each of the periods presented (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Revenue			
Advertising services	$2,617,397	$2,109,987	$2,248,052
Data licensing and other	424,962	333,312	281,567
Total revenue	3,042,359	2,443,299	2,529,619
Costs and expenses [(1)]			
Cost of revenue	964,997	861,242	932,240
Research and development	553,858	542,010	713,482
Sales and marketing	771,361	717,419	957,829
General and administrative	298,818	283,888	293,276
Total costs and expenses	2,589,034	2,404,559	2,896,827
Income (loss) from operations	453,325	38,740	(367,208)
Interest expense	(132,606)	(105,237)	(99,968)
Interest income	111,221	44,383	24,277
Other income (expense), net	(8,396)	(73,304)	2,065
Income (loss) before income taxes	423,544	(95,418)	(440,834)
Provision (benefit) for income taxes	(782,052)	12,645	16,039
Net income (loss)	$1,205,596	$(108,063)	$(456,873)

(1) Costs and expenses include stock-based compensation expense as follows (in thousands):

	Year Ended December 31,		
	2018	2017	2016
Cost of revenue	$17,289	$23,849	$29,502
Research and development	183,799	240,833	335,498
Sales and marketing	71,305	94,135	160,935
General and administrative	53,835	74,989	89,298

Total stock-based compensation expense	$326,228	$433,806	$615,233

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The following table sets forth our consolidated statement of operations data for each of the periods presented as a percentage of revenue:

	Year Ended December 31, 2018	2017	2016
Revenue			
Advertising services	86 %	86 %	89 %
Data licensing and other	14	14	11
Total revenue	100	100	100
Costs and expenses			
Cost of revenue	32	35	37
Research and development	18	22	28
Sales and marketing	25	29	38
General and administrative	10	12	12
Total costs and expenses	85	98	115
Income (loss) from operations	15	2	(15)
Interest expense	(4)	(4)	(4)
Interest income	4	2	1
Other income (expense), net	(0)	(3)	0
Income (loss) before income taxes	14	(4)	(17)
Provision (benefit) for income taxes	(26)	1	1
Net income (loss)	40 %	(4)%	(18)%

Years Ended December 31, 2018, 2017 and 2016

Revenue

We generate the substantial majority of our revenue from the sale of advertising services. We also generate revenue by licensing our data to third parties and providing mobile advertising exchange services.

Advertising Services

We generate most of our advertising revenue by selling our Promoted Products. Currently, our Promoted Products consist of the following:

- Promoted Tweets. Promoted Tweets, which are labeled as “promoted,” appear within a user’s timeline, search results or profile pages just like an ordinary Tweet regardless of device, whether it be desktop or mobile. Using our proprietary algorithms and understanding of the interests of each user, we can deliver Promoted Tweets that are intended to be relevant to a particular user. We enable our advertisers to target an audience based on our users’ interest graphs. Our Promoted Tweets are pay-for-performance or pay-for-impression delivered advertising that are priced through an auction. Our Promoted Tweets include objective-based features that allow advertisers to pay only for the types of engagement selected by the advertisers, such as Tweet engagements (e.g., Retweets, replies and likes), website clicks or conversions, mobile application installs or engagements, obtaining new followers, or video views.
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- Promoted Accounts. Promoted Accounts, which are labeled as “promoted,” provide a way for our advertisers to grow a community of users who are interested in their business, products or services. Our Promoted Accounts are pay-for-performance advertising that is priced through an auction.
- Promoted Trends. Promoted Trends, which are labeled as “promoted,” appear at the top of the list of trending topics or timeline for an entire day in a particular country or on a global basis. We sell our Promoted Trends on a fixed-fee-per-day basis.

While the majority of the Promoted Products we sell to our advertisers are placed on Twitter, we also generate advertising revenue by placing advertising products that we sell to advertisers on third-party publishers’ websites, applications or other offerings.

Data Licensing and Other

We generate data licensing and other revenue by (i) offering data products and data licenses that allow our data partners to access, search and analyze historical and real-time data on our platform, which data consists of public Tweets and their content, and (ii) providing mobile advertising exchange services through our MoPub exchange. Our data partners generally purchase licenses to access all or a portion of our data for a fixed period. We recognize data licensing revenue as our data partners consume and benefit from their continuous use of the licensed data over time. In addition, we operate a mobile ad exchange and receive service fees from transactions completed on the exchange. Our mobile ad exchange enables buyers and sellers to purchase and sell advertising inventory and matches buyers and sellers. We have determined we are not the principal as it relates to our performance obligation of providing an ad exchange service in the purchase and sale of advertising inventory in transactions between third-party buyers and sellers on the exchange. Therefore we report revenue related to our ad exchange services on a net basis.

	Year Ended December 31,			2017 to 2018 % Change	2016 to 2017 % Change
	2018	2017	2016		
	(in thousands)				
Advertising services	$2,617,397	$2,109,987	$2,248,052	24 %	(6)%
Data licensing and other	424,962	333,312	281,567	27 %	18 %
Total revenue	$3,042,359	$2,443,299	$2,529,619	25 %	(3)%

2018 Compared to 2017. Revenue in 2018 increased by $599.1 million compared to 2017.

In 2018, advertising revenue increased by 24% compared to 2017. The substantial majority of our advertising revenue was generated from our owned and operated platform. Advertising revenue generated from the sale of our advertising products on our owned and operated platform in 2018 was $2.46 billion as compared to $1.90 billion in 2017. Advertising revenue generated from the sale of our advertising products placed on third-party publishers' websites, applications and other offerings in 2018 was $154.4 million as compared to $211.2 million in 2017.

The overall increase in advertising revenue was primarily attributable to a 55% increase in the number of ad engagements offset by a 20% decrease in cost per ad engagement in 2018 compared to 2017. The increase in ad engagements was driven by increased demand and improved clickthrough rates. The decrease in cost per ad engagement reflects the ongoing mix shift to video ad engagements (which have overall lower cost per ad engagement compared to other ad formats), higher clickthrough rates, and a slight compression in like for like pricing.

The decrease in advertising revenue from the sale of our advertising products placed on third-party publishers' websites, applications and other offerings in 2018 was driven primarily by the lack of contribution from TellApart (which was deprecated in 2017). TellApart revenue contributed $44.6 million in revenue in 2017, mainly in the first half of 2017, and was fully deprecated in the fourth quarter of 2017.

Advertising revenue continued to be driven by continued sales momentum with advertisers, built around our differentiated ad formats, better relevance, and improved ROI. As our user base and the level of engagement of our users grow, we believe the potential to increase our revenue grows.

In 2018, data licensing and other revenue increased by 27% compared to 2017. A majority of the increase was attributable to expanded and new partnerships.

Looking ahead, while data licensing and other revenue continues to benefit from customers developing new use cases and smaller customers adopting self-service APIs, we are now largely through our multi-year enterprise renewal cycle. As a result, with many of our largest partners now at market pricing, revenue growth is likely to moderate in 2019.

2017 Compared to 2016. Revenue in 2017 decreased by $86.3 million compared to 2016.

In 2017, advertising revenue decreased by 6% compared to 2016. The substantial majority of our advertising revenue was generated from our owned and operated platform. Advertising revenue generated from the sale of our advertising products on our owned and operated platform in 2017 was $1.90 billion as compared to $1.99 billion in 2016. Advertising revenue generated from the sale of our advertising products placed on third-party publishers' websites, applications and other offerings in 2017 was $211.2 million as compared to $260.2 million in 2016. The decrease in advertising revenue from the sale of our advertising products placed on third-party publishers' websites, applications and other offerings in 2017 was driven by significantly lower contribution from TellApart (which was deprecated in 2017), which was offset by strong performance from Twitter Audience Platform. TellApart revenue was $44.6 million in 2017, mainly in the first half of 2017, compared to $126.4 million in 2016.

The overall decrease in advertising revenue was primarily attributable to a 52% decrease in cost per ad engagement offset by a 96% increase in the number of ad engagements in 2017 compared to 2016. The decrease in cost per ad engagement reflects a higher mix of video ad engagements (which have overall lower cost per ad engagement compared to other ad formats) and lower cost per ad engagement across the majority of ad formats compared to the fourth quarter of 2016. The increase in ad engagements was driven by a continuing mix shift toward video ad impressions as well as higher clickthrough rates.

Advertising revenue continued to be driven by strong growth in our video ad formats offset by declines in traditional Promoted Tweet and direct response ad formats.

In 2017, data licensing and other revenue increased by 18% compared to 2016. A majority of the increase was attributable to growth in data licensing fees from the offering of data products.

Cost of Revenue

Cost of revenue includes infrastructure costs, other direct costs including content costs, amortization of acquired intangible assets and amortization of capitalized labor costs for internally developed software, allocated facilities costs, as well as traffic acquisition costs, or TAC. Infrastructure costs consist primarily of data center costs related to our co-located facilities, which include lease and hosting costs, related support and maintenance costs and energy and bandwidth costs; as well as depreciation of servers and networking equipment; and personnel-related costs, including salaries, benefits and stock-based compensation, for our operations teams. TAC consists of costs we incur with third parties in connection with the sale to advertisers of our advertising products that we place on third-party publishers' websites, applications or other offerings collectively resulting from acquisitions, and from our organically-built advertising network, Twitter Audience Platform. Certain of the elements of our cost of revenue are fixed, and cannot be reduced in the near term.

	Year Ended December 31,			2017 to 2018 % Change	2016 to 2017 % Change
	2018	2017	2016		
	(in thousands)				
Cost of revenue	$964,997	$861,242	$932,240	12 %	(8)%
Cost of revenue as a percentage of revenue	32 %	35 %	37 %		

2018 Compared to 2017. In 2018, cost of revenue increased by $103.8 million compared to 2017. The increase was attributable to an $89.3 million increase in direct costs, primarily driven by an increase in content costs and a $50.4 million increase in depreciation and amortization expense primarily related to additional internally developed software, server and networking equipment. These increases were offset by a $35.3 million decrease in TAC substantially due to the lack of advertising revenue generated from TellApart (which we deprecated in 2017), and a $0.6 million decrease in other expenses.

2017 Compared to 2016. In 2017, cost of revenue decreased by $71.0 million compared to 2016. The decrease was attributable to a $48.6 million decrease in restructuring expenses, a $45.3 million decrease in infrastructure costs, a $42.7 million decrease in TAC substantially due to the decrease in advertising revenue generated from TellApart (which we deprecated in 2017), and a $3.5 million decrease in personnel-related costs. These decreases were offset by a $55.5 million increase in other direct costs that is primarily driven by an increase in content costs, and a $13.6 million increase in depreciation and amortization expense primarily related to additional internally developed software, server and networking equipment.

We plan to continue to scale the capacity and enhance the capability and reliability of our infrastructure to support user growth and increased activity on our platform. We expect that cost of revenue will increase in absolute dollar amounts and vary as a percentage of revenue.

Research and Development

Research and development expenses consist primarily of personnel-related costs, including salaries, benefits and stock-based compensation, for our engineers and other employees engaged in the research and development of our products and services. In addition, research and development expenses include amortization of acquired intangible assets, allocated facilities costs, and other supporting overhead costs.

	Year Ended December 31,			2017 to 2018 % Change	2016 to 2017 % Change
	2018	2017	2016		
	(in thousands)				
Research and development	$553,858	$542,010	$713,482	2 %	(24)%
Research and development as a percentage of revenue	18 %	22 %	28 %		

2018 Compared to 2017. In 2018, research and development expenses increased by $11.8 million compared to 2017. The increase was attributable to a $15.4 million net increase in allocated facilities costs, other supporting overhead expenses, and other expenses, and the absence of a $12.1 million one-time nonrecurring gain on sale of assets that occurred in the year ended December 31, 2017. These increases were offset by a $8.7 million net decrease in personnel-related costs driven by a decrease in stock-based compensation expense due partially to forfeitures offset in part by an increase in average employee headcount, and a $7.0 million increase in the capitalization of costs associated with developing software for internal use.

2017 Compared to 2016. In 2017, research and development expenses decreased by $171.5 million compared to 2016. The decrease was attributable to a $141.6 million decrease in personnel-related costs, mainly driven by a decrease in stock-based compensation expense, a $25.9 million decrease in restructuring charges net of a one-time nonrecurring gain on sale of assets in 2017, a $23.7 million decrease in allocated facilities and other supporting overhead expenses due to a decrease in overall total expenses, a $2.6 million decrease in other expenses, and a $2.5 million decrease in depreciation and amortization expense, offset by a $24.8 million decrease in the capitalization of costs associated with developing software for internal use.

We plan to continue to invest in key areas of our business to ensure that we have the right level of engineering, product management and design personnel and related resources to support our research and development efforts. We expect that research and development costs will increase in absolute dollar amounts and vary as a percentage of revenue.

Sales and Marketing

Sales and marketing expenses consist primarily of personnel-related costs, including salaries, commissions, benefits and stock-based compensation for our employees engaged in sales, sales support, business development and media, marketing, corporate communications and customer service functions. In addition, marketing and sales-related expenses also include advertising costs, market research, tradeshows, branding, marketing, public relations costs, amortization of acquired intangible assets, allocated facilities costs, and other supporting overhead costs.

	Year Ended December 31,			2017 to 2018 % Change	2016 to 2017 % Change
	2018	2017	2016		
	(in thousands)				
Sales and marketing	$771,361	$717,419	$957,829	8 %	(25)%
Sales and marketing as a percentage of revenue	25 %	29 %	38 %		

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2018 Compared to 2017. In 2018, sales and marketing expenses increased by $53.9 million compared to 2017. The increase was attributable to a $36.2 million net increase in allocated facilities costs and other supporting overhead expenses, a $9.3 million increase in marketing and sales-related expenses, and a $23.9 million net increase in personnel-related costs driven by an increase in average employee headcount offset in part by a decrease in stock-based compensation expense. These increases were offset by a $15.5 million decrease in amortization of acquired intangible assets due to certain intangible assets becoming fully amortized.

2017 Compared to 2016. In 2017, sales and marketing expenses decreased by $240.4 million compared to 2016. The decrease was attributable to a $116.0 million decrease in personnel-related costs, driven by a decrease in average employee headcount mainly as a result of our 2016 restructuring plan, a $54.0 million decrease in marketing and sales-related expenses, a $28.0 million decrease in allocated facilities and other supporting overhead expenses due to a decrease in overall total expenses, a $27.4 million decrease in restructuring expenses, and a $15.0 million decrease in amortization of acquired intangible assets.

We continue to evaluate key areas in our business to ensure we have the right level of sales and marketing to execute on our key priorities and objectives. We expect that sales and marketing costs will increase in absolute dollar amounts and vary as a percentage of revenue.

General and Administrative

General and administrative expenses consist primarily of personnel-related costs, including salaries, benefits and stock-based compensation, for our executive, finance, legal, information technology, human resources and other administrative employees. In addition, general and administrative expenses include fees and costs for professional services, including consulting, third-party legal and accounting services and facilities costs and other supporting overhead costs that are not allocated to other departments.

	Year Ended December 31,			2017 to 2018 % Change	2016 to 2017 % Change
	2018	2017	2016		
	(in thousands)				
General and administrative	$298,818	$283,888	$293,276	5 %	(3)%
General and administrative as a percentage of revenue	10 %	12 %	12 %		

2018 Compared to 2017. In 2018, general and administrative expense increased by $14.9 million compared to 2017. The increase was attributable to a $24.6 million net increase in personnel-related costs driven by an increase in average employee headcount offset in part by a decrease in stock-based compensation expense, and a $7.9 million increase in professional service fees. These increases were offset by a $17.6 million decrease in allocated facilities costs, other supporting overhead expenses, and other expenses.

2017 Compared to 2016. In 2017, general and administrative expense decreased by $9.4 million compared to 2016. The decrease was attributable to a $9.2 million decrease in personnel-related costs, mainly driven by a decrease in stock-based compensation expense, a $4.9 million decrease in facilities and supporting costs, and a $4.8 million decrease in restructuring charges. The decreases were offset by a $9.0 million increase in fees and costs for professional services, and a $0.5 million increase in other expenses.

We plan to continue to invest in key areas of our business and ensure that we have the right level of general and administrative support on our key priorities and objectives. We expect that general and administrative expenses will increase in absolute dollar amounts and vary as a percentage of revenue.

Interest Expense

Interest expense consists primarily of interest expense incurred in connection with the $935.0 million principal amount of 0.25% convertible senior notes due 2019, or the 2019 Notes, $954.0 million principal amount of 1.00% convertible senior notes due 2021, or the 2021 Notes, and the $1.15 billion principal amount of 0.25% convertible senior notes due 2024, or the 2024 Notes, and together with the 2019 Notes and 2021 Notes, the Notes, and interest expense related to capital leases and other financing facilities.

	Year Ended December 31,		
	2018	2017	2016
	(in thousands)		
Interest expense	$132,606	$105,237	$99,968

2018 Compared to 2017. In 2018, interest expense increased by $27.4 million compared to 2017 primarily due to the issuance of the 2024 Notes in June 2018. Interest expense in 2018 was comprised of $127.7 million of total interest expense related to the Notes as well as our credit facility (described below) and $4.9 million related to capital leases of equipment.

2017 Compared to 2016. In 2017, interest expense increased by $5.3 million compared to 2016. Interest expense in 2017 was comprised of $99.6 million of total interest expense related to the Notes as well as our credit facility (described below) and $5.6 million related to capital leases of equipment.

Interest Income

Interest income is generated from our cash equivalents and short-term investments net of the related amortization of premium paid on such investments.

	Year Ended December 31,		
	2018	2017	2016
	(in thousands)		
Interest income	$111,221	$44,383	$24,277

2018 Compared to 2017. In 2018, interest income increased by $66.8 million compared to 2017. The increase was primarily attributable to higher invested cash balances and higher interest rates.

2017 Compared to 2016. In 2017, interest income increased by $20.1 million compared to 2016. The increase was primarily attributable to higher invested cash balances and higher interest rates.

Other Income (Expense), Net

Other income (expense), net, consists of unrealized foreign exchange gains and losses due to re-measurement of monetary assets and liabilities denominated in non-functional currencies, realized foreign exchange gains and losses on foreign exchange transactions, and gains and losses on investments in privately-held companies. We expect our foreign exchange gains and losses will vary depending upon movements in the underlying exchange rates.

	Year Ended December 31,		
	2018	2017	2016
	(in thousands)		
Other income (expense), net	$(8,396)	$(73,304)	$2,065

2018 Compared to 2017. In 2018, other expense, net, was $8.4 million compared to other expense, net, of $73.3 million in 2017. The change was primarily attributable to a $3.0 million impairment charge in the year ended December 31, 2018, compared to a $62.4 million impairment charge in the year ended December 31, 2017, and the more favorable foreign currency exchange impacts from foreign currency-denominated assets and liabilities as well as derivative financial instruments.

2017 Compared to 2016. In 2017, other expense, net, was $73.3 million compared to other income, net, of $2.1 million in 2016. The change was primarily attributable to the recording of an impairment charge on an investment in a privately-held company of $62.4 million in 2017 and less favorable foreign currency exchange impacts from foreign currency-denominated assets and liabilities as well as derivative financial instruments.

Provision (Benefit) for Income Taxes

Our provision (benefit) for income taxes consists of federal and state income taxes in the United States and income taxes in certain foreign jurisdictions. In addition, the provision is impacted by deferred income taxes and changes in the related valuation allowance reflecting the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes.

In December 2017, the Tax Act was enacted into law and the new legislation contains several key tax provisions that affected us, including a reduction of the federal corporate income tax rate to 21% effective January 1, 2018. We are required to recognize the effect of the tax law changes in the period of enactment, such as re-measuring our U.S. deferred tax assets and liabilities as well as our valuation allowance against our net U.S. deferred tax assets. Also in December 2017, the SEC staff issued Staff Accounting Bulletin No. 118, Income Tax Accounting Implications of the 2017 Tax Cuts and Jobs Act (SAB 118), which allows us to record provisional amounts during a measurement period not to extend beyond one year of the enactment date. We completed our accounting for the Tax Act in the fourth quarter of 2018, within the one-year measurement period from the enactment. Please refer to Note 14 of the Notes to Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K for further information.

	Year Ended December 31,		
	2018	2017	2016
	(in thousands)		
Provision (benefit) for income taxes	$(782,052)	$12,645	$16,039

2018 Compared to 2017. Our benefit for income taxes in the twelve months ended December 31, 2018 was $782.1 million, compared to a provision for income taxes of $12.6 million in 2017. Our current provision for income taxes in the twelve months ended December 31, 2018 was $19.7 million, compared to a current provision of $19.1 million for the twelve months ended December 31, 2017. Our deferred benefit for income taxes in the twelve months ended December 31, 2018 was $801.7 million, compared to a deferred benefit for income taxes of $6.4 million in the twelve months ended December 31, 2017. The change is due to the release of our valuation allowance of $845.1 million related to Brazil and most of the United States federal and all states deferred tax assets with the exception of California and Massachusetts, offset by our current year income tax expense of $63.0 million, compared to a provision of $12.6 million in 2017. Excluding the release of our deferred tax asset valuation allowance, the change was primarily due to the increase in pre-tax profitability offset by an increase to the benefit of share-based compensation.

2017 Compared to 2016. Our provision for income taxes in 2017 decreased by $3.4 million compared to 2016 primarily due to an increase in the income tax benefit arising from intraperiod allocation and partial release of valuation allowance attributable to the Tax Act related to alternative minimum tax (AMT) credits.

We anticipate that going forward we will have income tax expense, which amounts could be affected by our jurisdictional mix of profit before taxes, the extent foreign earnings are taxed in the United States through new provisions under the Tax Act, changes in tax rates and tax regulations, the impact of tax examinations, the impact of business combinations, tax effects of share based compensation, and changes in the remaining valuation allowances.

Quarterly Results of Operations

The following table sets forth our unaudited consolidated statement of operations data for each of the eight quarters in the period ended December 31, 2018. The unaudited quarterly statement of operations data set forth below have been prepared on a basis consistent with our audited annual consolidated financial statements in this Annual Report on Form 10-K and include, in our opinion, all normal recurring adjustments necessary for a fair statement of the financial information contained in those statements. Our historical results are not necessarily indicative of the results that may be expected in the future. The following quarterly financial data should be read in conjunction with our audited consolidated financial statements and the related notes included elsewhere in this Annual Report on Form 10-K.

	Three Months Ended							
	Dec. 31, 2018	Sep. 30, 2018	Jun. 30, 2018	Mar. 31, 2018	Dec. 31, 2017	Sep. 30, 2017	Jun. 30, 2017	Mar. 31, 2017
	(Unaudited, in thousands, except per share data)							
Consolidated Statement of Operations Data:								
Revenue[(1)]								
Advertising services	$791,365	$649,816	$601,060	$575,156	$644,257	$502,802	$489,148	$473,780
Data licensing and other	117,471	108,295	109,481	89,715	87,303	86,831	84,707	74,471
Total revenue	908,836	758,111	710,541	664,871	731,560	589,633	573,855	548,251
Costs and expenses[(2)]								
Cost of revenue	268,345	243,644	230,185	222,823	217,979	210,016	212,908	220,339
Research and development	141,174	150,764	138,574	123,346	133,996	136,115	143,171	128,728
Sales and marketing	211,774	193,496	188,032	178,059	189,572	172,957	185,296	169,594
General and administrative	80,635	78,339	74,126	65,718	79,915	63,266	70,839	69,868
Total costs and expenses	701,928	666,243	630,917	589,946	621,462	582,354	612,214	588,529
Income (loss) from operations	206,908	91,868	79,624	74,925	110,098	7,279	(38,359)	(40,278)
Interest expense	(37,273)	(38,336)	(29,982)	(27,015)	(26,700)	(26,732)	(26,396)	(25,409)
Interest income	37,013	36,067	21,960	16,181	13,349	12,028	10,486	8,520
Other expense, net [(3)]	(111)	(2,341)	(5,735)	(209)	(3,194)	(10,106)	(58,806)	(1,198)
Income (loss) before income taxes	206,537	87,258	65,867	63,882	93,553	(17,531)	(113,075)	(58,365)
Provision (benefit) for income taxes [(4)]	(48,766)	(701,921)	(34,250)	2,885	2,474	3,564	3,413	3,194
Net income (loss)	$255,303	$789,179	$100,117	$60,997	$91,079	$(21,095)	$(116,488)	$(61,559)
Net income (loss) per share attributable to common stockholders:								
Basic	$0.34	$1.04	$0.13	$0.08	$0.12	$(0.03)	$(0.16)	$(0.09)
Diluted	$0.33	$1.02	$0.13	$0.08	$0.12	$(0.03)	$(0.16)	$(0.09)
Other Financial Information:								

Adjusted EBITDA[5]	$396,529	$295,403	$264,810	$244,054	$308,174	$206,999	$177,874	$169,939
Non-GAAP net income[6]	$244,141	$162,718	$133,955	$122,990	$141,407	$77,848	$56,370	$53,234

(1) We adopted the new revenue standard on January 1, 2018 using the modified retrospective method. Revenue was not materially impacted by the application of the new revenue standard in any of the quarters in 2018.

(2) Costs and expenses include stock-based compensation expense as follows:

	Three Months Ended							
	Dec. 31, 2018	Sep. 30, 2018	Jun. 30, 2018	Mar. 31, 2018	Dec. 31, 2017	Sep. 30, 2017	Jun. 30, 2017	Mar. 31, 2017
	(Unaudited, in thousands)							
Cost of revenue	$4,905	$4,247	$3,338	$4,799	$6,019	$5,625	$6,253	$5,952
Research and development	43,589	53,195	45,069	41,946	55,648	57,174	63,625	64,386
Sales and marketing	18,624	19,634	18,225	14,822	25,919	22,433	20,694	25,089
General and administrative	14,769	14,530	12,837	11,699	14,868	15,727	22,824	21,570
Total stock-based compensation expense	$81,887	$91,606	$79,469	$73,266	$102,454	$100,959	$113,396	$116,997

(3) In the second and third quarter of 2017, we incurred $55.0 million and $7.4 million, respectively, of impairment charges on an investment in a privately-held company.

(4) In the second quarter of 2018, we recorded a net benefit to tax expense of $43.4 million associated with the release of the valuation allowance related to deferred tax assets of our Brazil operations. In the third quarter of 2018, we recorded a net benefit to tax expense of $683.3 million associated with the release of the valuation allowance related to most of the United States federal and all states deferred tax assets with the exception of California and Massachusetts.

(5) The following table presents a reconciliation of net income (loss) to Adjusted EBITDA for each of the periods indicated:

	Three Months Ended							
	Dec. 31, 2018	Sep. 30, 2018	Jun. 30, 2018	Mar. 31, 2018	Dec. 31, 2017	Sep. 30, 2017	Jun. 30, 2017	Mar. 31, 2017
	(Unaudited, in thousands)							
Reconciliation of Net Income (Loss) to Adjusted EBITDA:								
Net income (loss)	$255,303	$789,179	$100,117	$60,997	$91,079	$(21,095)	$(116,488)	$(61,559)
Stock-based compensation expense	81,887	91,606	79,469	73,266	102,454	100,959	113,396	116,997
Depreciation and amortization expense	110,723	111,947	105,982	96,846	92,520	97,492	103,063	102,792
Interest and other expense, net	371	4,610	13,757	11,043	16,545	24,810	74,716	18,087
Provision (benefit) for income taxes	(48,766)	(701,921)	(34,250)	2,885	2,474	3,564	3,413	3,194
Restructuring charges and one-time nonrecurring gain	(2,989)	(18)	(265)	(983)	3,102	1,269	(226)	(9,572)
Adjusted EBITDA	$396,529	$295,403	$264,810	$244,054	$308,174	$206,999	$177,874	$169,939

(6) The following table presents a reconciliation of net income (loss) to non-GAAP net income for each of the periods indicated:

	Three Months Ended							
	Dec. 31, 2018	Sep. 30, 2018	Jun. 30, 2018	Mar. 31, 2018	Dec. 31, 2017	Sep. 30, 2017	Jun. 30, 2017	Mar. 31, 2017
	(Unaudited, in thousands)							
Reconciliation of Net Income (Loss) to Non-GAAP Net Income:								
Net income (loss)	$255,303	$789,179	$100,117	$60,997	$91,079	$(21,095)	$(116,488)	$(61,559)
Exclude: Provision (benefit) for income taxes	(48,766)	(701,921)	(34,250)	2,885	2,474	3,564	3,413	3,194

Income (loss) before income taxes	206,537	87,258	65,867	63,882	93,553	(17,531)	(113,075)	(58,365)
Stock-based compensation expense	81,887	91,606	79,469	73,266	102,454	100,959	113,396	116,997
Amortization of acquired intangible assets	4,786	4,380	4,876	4,942	4,929	11,077	14,340	16,191
Non-cash interest expense related to convertible notes	31,017	30,878	23,309	20,722	20,417	20,355	20,041	19,248
Impairment of investments in privately-held companies	—	0	3,000	—	—	7,439	55,000	—
Restructuring charges and one-time nonrecurring gain	(2,989)	(18)	(265)	(983)	3,102	1,269	(226)	(9,572)
Non-GAAP income before income taxes	321,238	214,104	176,256	161,829	224,455	123,568	89,476	84,499
Non-GAAP provision for income taxes	77,097	51,386	42,301	38,839	83,048	45,720	33,106	31,265
Non-GAAP net income	$244,141	$162,718	$133,955	$122,990	$141,407	$77,848	$56,370	$53,234

Credit Facility

In August 2018, we entered into a revolving credit agreement with certain lenders which provides for a $500.0 million revolving unsecured credit facility maturing on August 7, 2023. In connection with entering into the $500.0 million credit facility, we also terminated our $1.0 billion unsecured revolving credit facility. We are obligated to pay interest on loans under the new credit facility and other customary fees for a credit facility of this size and type, including an upfront fee and an unused commitment fee. The interest rate for the new credit facility is determined based on calculations using certain market rates as set forth in the credit agreement. As of December 31, 2018, no amounts had been drawn under the credit facility.

Liquidity and Capital Resources

	Year Ended December 31,		
	2018	2017	2016
	(In thousands)		
Consolidated Statements of Cash Flows Data:			
Net income (loss)	$1,205,596	$(108,063)	$(456,873)
Net cash provided by operating activities	1,339,711	831,209	763,055
Net cash provided used in investing activities	(2,055,513)	(116,526)	(593,248)
Net cash provided by (used in) financing activities	978,116	(78,373)	(83,975)

Our principal sources of liquidity are our cash, cash equivalents, and short-term investments in marketable securities. Our cash equivalents and marketable securities are invested primarily in short-term fixed income securities, including government and investment-grade debt securities and money market funds. In June 2018, we also received net proceeds of approximately $1.14 billion from the issuance of the 2024 Notes, after deducting the debt issuance costs. Concurrent with the sales of the 2024 Notes, we entered into privately-negotiated convertible note hedge transactions with respect to our common stock for which we paid approximately $268.0 million and sold warrants for which we received approximately $186.8 million.

As of December 31, 2018, we had $6.21 billion of cash, cash equivalents and short-term investments in marketable securities, of which $210.0 million was held by our foreign subsidiaries. During the SAB 118 period related to the Tax Act, we re-assessed our intentions related to certain of these funds held by our foreign subsidiaries in light of the reduced tax associated with repatriation. We have determined that we will no longer be indefinitely reinvested related to these funds and accrued the incremental foreign withholding taxes. In addition, we have a revolving unsecured credit facility available to borrow up to $500.0 million. We believe that our existing cash, cash equivalents and short-term investment balance, and our credit facility, together with cash generated from operations will be sufficient to meet our working capital, capital expenditure requirements for at least the next 12 months, and to repay the $936.2 million of principal and coupon interest associated with our 2019 Notes due in September 2019.

Operating Activities

Cash provided by operating activities consists of net income (loss) adjusted for certain non-cash items including depreciation and amortization, stock-based compensation, amortization of discount on our Notes, deferred income taxes, impairment of investments in privately-held companies, non-cash restructuring charges, as well as the effect of changes in working capital and other activities. We expect that cash provided by operating activities will fluctuate in future periods as a result of a number of factors, including fluctuations in our revenue, increases in operating expenses and costs related to acquisitions. For additional discussion, see Part I, Item 1A,"Risk Factors."

Cash provided by operating activities in 2018 was $1.34 billion, an increase in cash inflow of $508.5 million compared to 2017. Cash provided by operating activities was driven by net income of $1.21 billion, as adjusted for the exclusion of non-cash expenses and other adjustments totaling $44.8 million, of which the most significant items were a $845.1 million net benefit to tax expense associated with the release of the valuation allowance related to deferred tax assets, $425.5 million of depreciation and amortization expense, and $326.2 million of stock-based compensation expense, and the effect of changes in working capital and other carrying balances that resulted in cash inflows of $89.3 million, which was in part driven by a one-time refund of prepaid employment taxes of $147.5 million.

Cash provided by operating activities in 2017 was $831.2 million, an increase in cash inflow of $68.2 million compared to 2016. Cash provided by operating activities was driven by a net loss of $108.1 million, as adjusted for the exclusion of non-cash expenses and other adjustments totaling $971.5 million, of which the most significant items were $433.8 million of stock-based compensation expense, $395.9 million of depreciation and amortization expense and $62.4 million of impairment charges on an investment in a privately-held company, and the effect of changes in working capital and other carrying balances that resulted in cash outflows of $32.2 million.

Cash provided by operating activities in 2016 was $763.1 million, an increase in cash inflow of $380.0 million compared to 2015. Cash provided by operating activities was driven by a net loss of $456.9 million, as adjusted for the exclusion of non-cash expenses and other adjustments totaling $1.14 billion, of which the most significant items were $615.2 million of stock-based compensation expense, and the effect of changes in working capital and other carrying balances that resulted in cash outflow of $82.6 million.

Investing Activities

Our primary investing activities consist of purchases of property and equipment, particularly purchases of servers and networking equipment, leasehold improvements for our facilities, purchases and disposal of marketable securities, strategic investments in privately-held companies, acquisitions of businesses and other activities.

Cash used in investing activities in 2018 was $2.06 billion, an increase in cash outflow of $1.94 billion compared to 2017. The change was primarily due to a $2.65 billion increase in purchases of marketable securities, a $323.2 million increase in purchases of property and equipment, an absence of $35.0 million in proceeds from sale of long-lived assets, and a net increase of $33.6 million in cash used in business combinations, offset by a $1.09 billion net increase in proceeds from sales and maturities of marketable securities, a $2.6 million decrease in expenditures on other investing activities and a $10.3 million increase in proceeds from sales of property and equipment.

Cash used in investing activities in 2017 was $116.5 million, a decrease in cash outflow of $476.7 million compared to 2016. The change was primarily due to a $221.4 million decrease in the purchases of marketable securities, a $80.7 million decrease in purchases of investments in privately-held companies, a net $85.1 million decrease in cash used in business combinations, a $57.9 million decrease in purchases of property and equipment, a $35.0 million increase in proceeds from sale of long-lived assets, a $2.8 million increase in net proceeds from sales and maturities of marketable securities, and a $2.8 million increase in proceeds from sales of property and equipment, offset by a $8.9 million increase in expenditures on other investing activities.

Cash used in investing activities in 2016 was $593.2 million, a decrease in cash outflow of $305.6 million compared to 2015. The decrease in cash outflow was due to decreased purchases of marketable securities of $774.9 million, property and equipment of $128.6 million and other investments of $9.9 million, offset by a decrease in sales and maturities of marketable securities of $503.4 million, an increase in purchase of investments in privately-held companies of $71.0 million, and an increase in use of cash as acquisition consideration of $33.4 million.

We anticipate making capital expenditures in 2019 of approximately $550 million to $600 million as we continue to expand our co-located data centers.

Financing Activities

Our primary financing activities consist of issuances of securities, including common stock issued under our employee stock purchase plan, capital lease financing and stock option exercises by employees and other service providers.

Cash provided by financing activities in 2018 was $978.1 million, compared to $78.4 million cash used in financing activities in 2017. The change was due to net proceeds of $1.14 billion from the issuance of convertible notes net of issuance costs, reduced by the net cash outflow of $81.2 million from the purchase of convertible note hedges and sale of warrants closed in connection with the issuance of convertible notes, a $12.4 million decrease in payments of capital lease obligations, and a $5.4 million increase in proceeds from the issuance of shares of stock from the ESPP, offset by a $10.3 million increase in tax payments related to net share settlements of equity awards and a $6.0 million decrease in proceeds from option exercises.

Cash used in financing activities in 2017 was $78.4 million, a decrease in cash outflow of $5.6 million compared to 2016. The decrease in cash outflow was due to a $6.4 million decrease in taxes paid related to net share settlement of equity awards and other activities and a $1.9 million increase in proceeds from option exercises. These decreases were offset by a $2.2 million increase in payments of capital lease obligations and a $0.5 million decrease in proceeds from the issuance of shares of stock from ESPP.

Cash used in financing activities in 2016 was $84.0 million, an increase in cash outflow of $21.0 million compared to 2015. The increase in cash outflow was due to a $14.9 million decrease in proceeds from the issuance of shares of stock from ESPP, a net $13.3 million increase in tax payments related to net share settlements of equity awards and other activities, and a net $9.8 million decrease in proceeds from option exercises, offset by a reduction in repayments of capital lease obligations of $17.0 million.

Off Balance Sheet Arrangements

We do not have any off-balance sheet arrangements and did not have any such arrangements in 2018, 2017 or 2016.

Contractual Obligations

Our principal commitments consist of obligations under the Notes (including principal and coupon interest), capital and operating leases for equipment, office space and co-located data center facilities, as well as non-cancellable contractual commitments. The following table summarizes our commitments to settle contractual obligations in cash as of December 31, 2018.

	Payments Due by Year				
	Total	2019	2020-2021	2022-2023	Thereafter
	(In thousands)				
2019 Notes	$937,338	$937,338	$—	$—	$—
2021 Notes	982,646	9,540	973,106	—	—
2024 Notes	1,165,781	2,867	5,742	5,734	1,151,438
Operating lease obligations (1)	839,512	161,932	262,604	151,535	263,441
Capital lease obligations	94,920	70,506	24,414	—	—
Other contractual commitments (2)	346,922	65,768	135,205	134,404	11,545
Total contractual obligations	$4,367,119	$1,247,951	$1,401,071	$291,673	$1,426,424

(1) We have entered into several sublease agreements for office space that we are not fully utilizing. Under the sublease agreements, we will receive approximately $52.5 million in sublease income over the next four years.

(2) Other contractual commitments are non-cancelable contractual commitments primarily related to our infrastructure services, bandwidth and other services arrangements.

As of December 31, 2018, we had recorded liabilities of $17.9 million related to uncertain tax positions. Due to uncertainties in the timing of potential tax audits, the timing of the resolution of these positions is uncertain and we are unable to make a reasonably reliable estimate of the timing of payments in individual years beyond 12 months. As a result, this amount is not included in the above table.

Critical Accounting Policies and Estimates

We prepare our consolidated financial statements in accordance with GAAP. In doing so, we have to make estimates and assumptions that affect our reported amounts of assets, liabilities, revenue and expenses, as well as related disclosure of contingent assets and liabilities. To the extent that there are material differences between these estimates and actual results, our financial condition or operating results would be affected. We base our estimates on past experience and other assumptions that we believe are reasonable under the circumstances, and we evaluate these estimates on an ongoing basis. We refer to accounting estimates of this type as critical accounting policies and estimates, which we discuss further below.

Revenue Recognition

We generate the substantial majority of our revenue from the sale of advertising services with the balance from data licensing and other arrangements.

We generate our advertising revenue primarily from the sale of our Promoted Products: (i) Promoted Tweets, (ii) Promoted Accounts and (iii) Promoted Trends. Promoted Tweets and Promoted Accounts are pay-for-performance advertising products or pay on impressions delivered, each priced through an auction. Promoted Trends are featured by geography and offered on a fixed-fee-per-day basis. Advertisers are obligated to pay when a user engages with a Promoted Tweet, follows a Promoted Account, when an impression is delivered, or when a Promoted Trend is displayed. These advertising services may be sold in combination as a bundled arrangement or separately on a stand-alone basis.

For our Promoted Product arrangements, significant judgments are (i) identifying the performance obligations in the contract, (ii) determining the basis for allocating contract consideration to performance obligations, (iii) determining whether we are the principal or the agent in arrangements where another party is involved in providing specified services to a customer, and (iv) estimating the transaction price to be allocated for contracts with tiered rebate provisions.

We may generate revenue from the sale of certain Promoted Tweets through placement by Twitter of advertiser ads against third-party publisher content. We will pay the third-party publisher a revenue share fee for our right to monetize their content. In such transactions, advertisers are contracting to obtain a single integrated advertising service, the Promoted Tweet combined with the third-party publisher content, and we obtain control of the third-party publisher content displayed on Twitter that we then combine with the advertiser ads within the Promoted Tweet. Therefore, we report advertising revenue generated from these transactions on a gross basis and record the related third-party content monetization fees as cost of revenue.

We also generate advertising revenue by selling services in which we place ads on third-party publishers’ websites, applications or other offerings. To fulfill these transactions, we purchase advertising inventory from third-party publishers’ websites and applications where we have identified the advertisers’ targeted audience and therefore incur traffic acquisition costs prior to transferring the advertising service to our customers. At such point, we have the sole ability to monetize the third-party publishers advertising inventory. In such transactions, we obtain control of a right to a service to be performed by the third-party publishers, which gives us the ability to direct those publishers to provide the services to our customers on our behalf. Therefore, we report advertising revenue generated from these transactions on a gross basis, and we record the related traffic acquisition costs as cost of revenue.

Fees for the advertising services above are recognized in the period when advertising is delivered as evidenced by a user engaging with a Promoted Tweet or an ad on a third-party publisher website or application in a manner satisfying the types of engagement selected by the advertisers, such as Tweet engagements (e.g., retweets, replies and likes), website clicks, mobile application installs or engagements, obtaining new followers, or video views, following a Promoted Account, delivery of impressions, or through the display of a Promoted Trend on our platform.

We have concluded that our data licensing arrangements, which grant customers a right to Twitter’s intellectual property (“IP”) for a defined period of time, may contain a single performance obligation satisfied at a point in time (“Historical IP”) or over time (“Future IP”), or may contain two or more performance obligations satisfied separately at a point in time (Historical IP) and over time (Future IP). In some of our data licensing arrangements, pricing is a fixed monthly fee over a specified term. In arrangements with a single performance obligation satisfied over time, data licensing revenue is recognized on a straight-line basis over the period in which we provide data as the customer consumes and benefits from the continuous data available on an ongoing basis. In arrangements with at least two performance obligations, we allocate revenue on a relative basis between the performance obligations based on standalone selling price (“SSP”) and recognize revenue as the performance obligations are satisfied.

In other data licensing arrangements, we charge customers based on the amount of sales they generate from downstream customers using Twitter data. Certain of those royalty-based data licensing arrangements are subject to minimum guarantees. For such arrangements with a minimum guarantee and a single Future IP performance obligation, we recognize revenue for minimum guarantees on a straight-line basis over the period in which we provide data. For such arrangements with a minimum guarantee and two or more performance obligations, we allocate revenue on a relative basis between the performance obligations based on SSP and recognize revenue as the performance obligations are satisfied. Royalties in excess of minimum guarantees, if any, are recognized as revenue in the period that the related downstream customer sales using our licensed data occur, and such amounts have been immaterial to date.

For data licensing arrangements involving two or more performance obligations, we use directly observable standalone transactions to determine SSP of Historical IP. We use standalone transactions and consider all other reasonably available observable evidence to estimate SSP of Future IP.

Other revenue is primarily generated from service fees from transactions completed on our mobile ad exchange. Our mobile ad exchange enables buyers and sellers to purchase and sell advertising inventory by matching them in the exchange. We have determined we are not the principal in the purchase and sale of advertising inventory in transactions between third-party buyers and sellers on the exchange because we do not obtain control of the advertising inventory. We report revenue related to our ad exchange services on a net basis for the fees paid by buyers, net of costs related to acquiring the advertising inventory paid to sellers.

Arrangements involving multiple performance obligations primarily consist of combinations of our pay-for-performance products, Promoted Tweets and Promoted Accounts, which are priced through an auction, and Promoted Trends, which are priced on a fixed-fee-per day, per geography basis. For arrangements that include a combination of these products, we develop an estimate of the standalone selling price for these products in order to allocate any potential discount to all performance obligations in the arrangement. The estimate of standalone selling price for pay-for-performance auction based products is determined based on the winning bid price. The estimate of standalone selling price for Promoted Trends is based on Promoted Trends sold on a standalone basis and/or separately priced in a bundled arrangement by reference to a list price by geography, which is updated and approved periodically. For other arrangements involving multiple performance obligations where neither auction pricing nor standalone sales provide sufficient evidence of standalone selling price, we estimate standalone selling price using either an adjusted market assessment approach or an expected cost plus margin approach. We believe the use of our estimation approach and allocation of the transaction price on a relative standalone selling price basis to each performance obligation results in revenue recognition in a manner consistent with the underlying economics of the transaction and the allocation principle included in Topic 606. We have elected to exclude certain sales and indirect taxes from the determination of the transaction price.

Income Taxes

We are subject to income taxes in the United States and several foreign jurisdictions. Significant judgment is required in determining our provision (benefit) for income taxes and income tax assets and liabilities, including evaluating uncertainties in the application of accounting principles and complex tax laws.

We record a provision (benefit) for income taxes for the anticipated tax consequences of the reported results of operations using the asset and liability method. Under this method, we recognize deferred income tax assets and liabilities for the expected future tax consequences of temporary differences between the financial reporting and tax bases of assets and liabilities, as well as for loss and tax credit carryforwards. 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 deferred income tax effects of a change in tax rates in the period of the enactment. We record a valuation allowance to reduce our deferred tax assets to the net amount that we believe is more likely than not to be realized.

We recognize tax benefits from uncertain tax positions if we believe that it is more likely than not that the tax position will be sustained on examination by the taxing authorities based on the technical merits of the position. Although we believe we have adequately reserved for our uncertain tax positions (including net interest and penalties), we can provide no assurance that the final tax outcome of these matters will not be different. We make adjustments to these reserves in accordance with income tax accounting guidance when facts and circumstances change, such as the closing of a tax audit. To the extent that the final tax outcome of these matters is different from the amounts recorded, such differences may impact the provision (benefit) for income taxes in the period in which such determination is made. We record interest and penalties related to our uncertain tax positions in our provision (benefit) for income taxes.

The Tax Act contains several key tax provisions that affected us, including a reduction of the federal corporate income tax rate to 21% effective January 1, 2018. We are required to recognize the effect of the tax law changes in the period of enactment, such as re-measuring our U.S. deferred tax assets and liabilities as well as our valuation allowance against our net U.S. deferred tax assets. In December 2017, the SEC staff issued Staff Accounting Bulletin No. 118, Income Tax Accounting Implications of the 2017 Tax Cuts and Jobs Act (SAB 118), which allowed us to record provisional amounts during a measurement period not to extend beyond one year of the enactment date. We completed our accounting for the Tax Act in the fourth quarter of 2018, within the one year-measurement period from the enactment date. We elected to account for Global Intangible Low-Taxed Income (GILTI) under the Tax Act as a period cost when the expense is incurred and apply the approach of tax law ordering for reflecting the realization of loss carryforward expected to offset future GILTI.

Loss Contingencies

We are involved in various lawsuits, claims, investigations, and proceedings that arise in the ordinary course of business. Certain of these matters include speculative claims for substantial or indeterminate amounts of damages. We record a liability when we believe that it is both probable that a loss has been incurred and the amount or range can be reasonably estimated. Significant judgment is required to determine both probability and the estimated amount. We review these provisions on a quarterly basis and adjust these provisions accordingly to reflect the impact of negotiations, settlements, rulings, advice of legal counsel, and updated information.

We believe that the amount or estimable range of reasonably possible loss, will not, either individually or in the aggregate, have a material adverse effect on our business, consolidated financial position, results of operations, or cash flows with respect to loss contingencies for legal and other contingencies as of December 31, 2018. However, the outcome of litigation is inherently uncertain. Therefore, if one or more of these legal matters were resolved against us for amounts in excess of management's expectations, our results of operations and financial condition, including in a particular reporting period, could be materially adversely affected.

Business Combinations

We account for acquisitions of entities that include inputs and processes and have the ability to create outputs as business combinations. The purchase price of the acquisition is allocated to the tangible and intangible assets acquired and liabilities assumed based on their estimated fair values at the acquisition dates. The excess of the purchase price over those fair values is recorded as goodwill. During the measurement period, which may be up to one year from the acquisition date, we may record adjustments to the assets acquired and liabilities assumed with the corresponding offset to goodwill. Upon the conclusion of the measurement period or final determination of the values of assets acquired or liabilities assumed, whichever comes first, any subsequent adjustments are recorded to the consolidated statements of operations.

Accounting for business combinations requires our management to make significant estimates and assumptions at the acquisition date, including estimated fair value of acquired intangible assets, estimated fair value of stock awards assumed from the acquirees that are included in the purchase price, estimated income tax assets and liabilities assumed from the acquirees, and determination of the fair value of contractual obligations, where applicable. The estimates of fair value require management to also make estimates of, among other things, future expected cash flows, discount rates or expected costs to reproduce an asset. Although we believe the assumptions and estimates we made at the time were reasonable and appropriate, these estimates are based on historical experience and information obtained from the management of the acquired companies and are inherently uncertain.

Impact of Recently Issued Accounting Standards

The impact of recently issued accounting standards is set forth in Note 2, Summary of Significant Accounting Policies, of the Notes to Consolidated Financial Statements under Part II, Item 8 of this Annual Report on Form 10-K.

Item 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

We have operations both within the United States and internationally, and we are exposed to market risks in the ordinary course of our business. These risks include primarily interest rate and foreign exchange risks.

Interest Rate Fluctuation Risk

Our investment portfolio mainly consists of short-term fixed income securities, including government and investment-grade debt securities and money market funds. These securities are classified as available-for-sale and, consequently, are recorded in the consolidated balance sheets at fair value with unrealized gains or losses, net of tax reported as a separate component of accumulated other comprehensive loss. Our investment policy and strategy is focused on the preservation of capital and supporting our liquidity requirements. We do not enter into investments for trading or speculative purposes.

A rise in interest rates could have a material adverse impact on the fair value of our investment portfolio. Based on our investment portfolio balance as of December 31, 2018, a hypothetical increase in interest rates of 100 basis points would result in a decrease of approximately $17.7 million in the fair value of our available-for-sale securities. We currently do not hedge these interest rate exposures.

In 2014 and 2018, we issued convertible senior notes with in aggregate principal amount of $1.89 billion and $1.15 billion, respectively. We carry the Notes at face value less amortized discount on the consolidated balance sheet. Since the Notes bear interest at fixed rates, we have no financial statement risk associated with changes in interest rates. However, the fair value of the Notes changes when the market price of our stock fluctuates or interest rates change.

Foreign Currency Exchange Risk

Transaction Exposure

We transact business in various foreign currencies and have international revenue, as well as costs denominated in foreign currencies, primarily the Euro, British Pound, Singapore Dollar and Japanese Yen. This exposes us to the risk of fluctuations in foreign currency exchange rates. Accordingly, changes in exchange rates, and in particular a continuing strengthening of the U.S. dollar, would negatively affect our revenue and other operating results as expressed in U.S. dollars.

We have experienced and will continue to experience fluctuations in our net loss as a result of transaction gains or losses related to revaluing and ultimately settling certain asset and liability balances that are denominated in currencies other than the functional currency of the entities in which they are recorded. Foreign currency net losses were $4.6 million in 2018. We currently utilize foreign currency forward contracts with financial institutions to reduce the risk that our earnings may be adversely affected by the impact of exchange rate fluctuations on monetary assets or liabilities denominated in currencies other than the local currency of a subsidiary. These contracts are not designated as hedging instruments. We may in the future enter into other derivative financial instruments if it is determined that such hedging activities are appropriate to further reduce our foreign currency exchange risk. Based on our foreign currency exposures from monetary assets and liabilities net of our open hedge position, we estimated that a 10% change in exchange rates against the U.S. dollar would have resulted in a gain or loss of approximately $5.6 million as of December 31, 2018.

Translation Exposure

We are also exposed to foreign exchange rate fluctuations as we translate the financial statements of our foreign subsidiaries into U.S. dollars in consolidation. If there is a change in foreign currency exchange rates, the translating adjustments resulting from the conversion of our foreign subsidiaries' financial statements into U.S. dollars would result in a gain or loss recorded as a component of accumulated other comprehensive loss which is part of stockholders' equity.

Item 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

The supplementary financial information required by this Item 8 is included in Item 7 under the caption “Quarterly Results of Operations.”

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Stockholders of Twitter, Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Twitter, Inc. and its subsidiaries (the “Company”) as of December 31, 2018 and 2017, and the related consolidated statements of operations, of comprehensive income, of stockholders’ equity and of cash flows for each of the three years in the period ended December 31, 2018, including the related notes and financial statement schedule listed in the index appearing under Item 15.2 (collectively referred to as the “consolidated financial statements”). We also have audited the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

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

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Report on Internal Control over Financial Reporting appearing under Item 9A. Our responsibility is to express opinions on the Company’s consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

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

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

/s/ PricewaterhouseCoopers LLP

San Francisco, California

February 20, 2019

We have served as the Company’s auditor since 2009.

TWITTER, INC.

CONSOLIDATED BALANCE SHEETS

(In thousands, except par value)

	December 31, 2018	December 31, 2017
Assets		
Current assets:		
Cash and cash equivalents	$ 1,894,444	$ 1,638,413
Short-term investments	4,314,957	2,764,689
Accounts receivable, net of allowance for doubtful accounts of $3,559 and $5,430	788,700	664,268
Prepaid expenses and other current assets	112,935	254,514
Total current assets	7,111,036	5,321,884
Property and equipment, net	885,078	773,715
Intangible assets, net	45,025	49,654
Goodwill	1,227,269	1,188,935
Deferred tax assets, net	808,459	10,455
Other assets	85,705	67,834
Total assets	$ 10,162,572	$ 7,412,477
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable	$ 145,186	$ 170,969
Accrued and other current liabilities	405,751	327,333
Convertible notes, short-term	897,328	—
Capital leases, short-term	68,046	84,976
Total current liabilities	1,516,311	583,278
Convertible notes, long-term	1,730,922	1,627,460
Capital leases, long-term	24,394	81,308
Deferred and other long-term tax liabilities, net	17,849	13,240
Other long-term liabilities	67,502	59,973
Total liabilities	3,356,978	2,365,259
Commitments and contingencies (Note 15)		
Stockholders' equity:		
Preferred stock, $0.000005 par value-- 200,000 shares authorized; none issued and outstanding	—	—
Common stock, $0.000005 par value-- 5,000,000 shares authorized; 764,257 and 746,902 shares issued and outstanding	4	4
Additional paid-in capital	8,324,974	7,750,522
Accumulated other comprehensive loss	(65,311)	(31,579)
Accumulated deficit	(1,454,073)	(2,671,729)
Total stockholders' equity	6,805,594	5,047,218
Total liabilities and stockholders' equity	$ 10,162,572	$ 7,412,477

The accompanying notes are an integral part of these consolidated financial statements.

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TWITTER, INC.

CONSOLIDATED STATEMENTS OF OPERATIONS

(In thousands, except per share data)

	Year Ended December 31,		
	2018	2017	2016
Revenue	$3,042,359	$2,443,299	$2,529,619
Costs and expenses			
Cost of revenue	964,997	861,242	932,240
Research and development	553,858	542,010	713,482
Sales and marketing	771,361	717,419	957,829
General and administrative	298,818	283,888	293,276
Total costs and expenses	2,589,034	2,404,559	2,896,827
Income (loss) from operations	453,325	38,740	(367,208)
Interest expense	(132,606)	(105,237)	(99,968)
Interest income	111,221	44,383	24,277
Other income (expense), net	(8,396)	(73,304)	2,065
Income (loss) before income taxes	423,544	(95,418)	(440,834)
Provision (benefit) for income taxes	(782,052)	12,645	16,039
Net income (loss)	$1,205,596	$(108,063)	$(456,873)
Net income (loss) per share attributable to common stockholders:			
Basic	$1.60	$(0.15)	$(0.65)
Diluted	$1.56	$(0.15)	$(0.65)
Weighted-average shares used to compute net income (loss) per share attributable to common stockholders:			
Basic	754,326	732,702	702,135
Diluted	772,686	732,702	702,135

The accompanying notes are an integral part of these consolidated financial statements.

TWITTER, INC.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)

(In thousands)

	Year Ended December 31,		
	2018	2017	2016
Net income (loss)	$1,205,596	$(108,063)	$(456,873)
Other comprehensive income (loss), net of tax:			
Change in unrealized gain (loss) on investments in available-for-sale securities	(393)	(1,325)	1,685
Change in foreign currency translation adjustment	(33,339)	38,999	(25,372)
Net change in accumulated other comprehensive income (loss)	(33,732)	37,674	(23,687)
Comprehensive income (loss)	$1,171,864	$(70,389)	$(480,560)

The accompanying notes are an integral part of these consolidated financial statements.

TWITTER, INC.

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

(In thousands)

	Year Ended December 31,					
	2018		2017		2016	
	Shares	Amount	Shares	Amount	Shares	Amount
Common stock						
Balance, beginning of period	746,902	$4	721,572	$4	694,132	$3
Issuance of common stock in connection with RSU vesting	15,026	—	20,855	—	26,909	1
Issuance of common stock in connection with acquisitions	119	—	—	—	41	—
Issuance of restricted stock in connection with acquisitions accounted for as stock-based compensation	655	—	—	—	3,364	—
Exercise of stock options	634	—	3,733	—	2,864	—
Issuance of common stock upon purchases under employee stock purchase plan	1,539	—	1,735	—	2,039	—
Shares withheld related to net share settlement of equity awards	(610)	—	(531)	—	(878)	—
Cancellation of shares contributed by the CEO	—	—	—	—	(6,814)	—
Other activities	(8)	—	(462)	—	(85)	—
Balance, end of period	764,257	$4	746,902	$4	721,572	$4
Additional paid-in capital						
Balance, beginning of period	—	$7,750,522	—	$7,224,534	—	$6,507,087
Cumulative-effect adjustment from adoption of stock-based compensation expense simplification rule	—	—	—	13,316	—	—
Issuance of common stock in connection with acquisitions	—	5,405	—	—	—	735
Issuance of stock options in connection with acquisitions	—	917	—	—	—	—
Issuance of restricted stock in connection with acquisitions	—	12,843	—	—	—	—
Exercise of stock options	—	3,442	—	9,515	—	7,714
Issuance of common stock upon purchases under employee stock purchase plan	—	29,288	—	23,920	—	24,431
Shares withheld related to net share settlement of equity awards	—	(19,256)	—	(8,962)	—	(15,598)
Stock-based compensation	—	367,668	—	488,123	—	695,525
	—	252,248	—	—	—	—

Equity component of the convertible note issuance, net						
Purchase of convertible note hedge	—	(267,950)	—	—	—	—
Issuance of warrants	—	186,760	—	—	—	—
Other activities	—	3,087	—	76	—	4,640
Balance, end of period	—	$8,324,974	—	$7,750,522	—	$7,224,534
Accumulated other comprehensive loss						
Balance, beginning of period	—	$(31,579)	—	$(69,253)	—	$(45,566)
Other comprehensive income (loss)	—	(33,732)	—	37,674	—	(23,687)
Balance, end of period	—	$(65,311)	—	$(31,579)	—	$(69,253)
Accumulated deficit						
Balance, beginning of period	—	$(2,671,729)	—	$(2,550,350)	—	$(2,093,477)
Cumulative-effect adjustment from adoption of revenue recognition rule	—	$12,060	—	—	—	—
Cumulative-effect adjustment from adoption of stock-based compensation expense simplification rule	—	—	—	(13,316)	—	—
Net income (loss)	—	1,205,596	—	(108,063)	—	(456,873)
Balance, end of period	—	$(1,454,073)	—	$(2,671,729)	—	$(2,550,350)
Total stockholders' equity	764,257	$6,805,594	746,902	$5,047,218	721,572	$4,604,935

The accompanying notes are an integral part of these consolidated financial statements.

TWITTER, INC.

CONSOLIDATED STATEMENTS OF CASH FLOWS

(In thousands)

	Year Ended December 31, 2018	2017	2016
Cash flows from operating activities			
Net income (loss)	$1,205,596	$(108,063)	$(456,873)
Adjustments to reconcile net income (loss) to net cash provided by operating activities:			
Depreciation and amortization expense	425,498	395,867	402,172
Stock-based compensation expense	326,228	433,806	615,233
Amortization of discount on convertible notes	105,926	80,061	74,660
Deferred income taxes	(801,720)	(6,415)	(4,775)
Impairment of investments in privately-held companies	3,000	62,439	4,000
Other adjustments	(14,139)	5,753	46,042
Changes in assets and liabilities, net of assets acquired and liabilities assumed from acquisitions:			
Accounts receivable	(130,871)	2,668	(22,969)
Prepaid expenses and other assets	126,470	(13,974)	7,101
Accounts payable	(1,533)	8,371	(7,112)
Accrued and other liabilities	95,256	(29,304)	105,576
Net cash provided by operating activities	1,339,711	831,209	763,055
Cash flows from investing activities			
Purchases of property and equipment	(483,934)	(160,742)	(218,657)
Proceeds from sales of property and equipment	13,070	2,783	—
Purchases of marketable securities	(5,334,396)	(2,687,214)	(2,908,611)
Proceeds from maturities of marketable securities	3,732,973	2,579,747	2,518,631
Proceeds from sales of marketable securities	58,721	124,826	183,154
Proceeds from sales of long-lived assets	—	35,000	—
Purchases of investments in privately-held companies	(3,375)	(825)	(81,502)
Business combinations, net of cash acquired	(33,572)	—	(85,082)
Other investing activities	(5,000)	(10,101)	(1,181)
Net cash used in investing activities	(2,055,513)	(116,526)	(593,248)
Cash flows from financing activities			
Proceeds from issuance of convertible notes	1,150,000	—	—
Purchases of convertible note hedges	(267,950)	—	—
Proceeds from issuance of warrants concurrent with note hedges	186,760	—	—
Debt issuance costs	(13,783)	—	—
Taxes paid related to net share settlement of equity awards	(19,263)	(8,962)	(15,598)
Payments of capital lease obligations	(90,351)	(102,775)	(100,558)
Proceeds from exercise of stock options	3,415	9,444	7,540
Proceeds from issuances of common stock under employee stock purchase plan	29,288	23,920	24,641
Net cash provided by (used in) financing activities	978,116	(78,373)	(83,975)

Net increase in cash, cash equivalents and restricted cash	262,314	636,310	85,832
Foreign exchange effect on cash, cash equivalents and restricted cash	(14,296)	9,914	(3,754)
Cash, cash equivalents and restricted cash at beginning of period	1,673,857	1,027,633	945,555
Cash, cash equivalents and restricted cash at end of period	$1,921,875	$1,673,857	$1,027,633
Supplemental cash flow data			
Interest paid in cash	$14,547	$13,990	$12,953
Taxes paid in cash	$33,065	$16,216	$14,532
Supplemental disclosures of non-cash investing and financing activities			
Common stock issued in connection with acquisitions	$19,165	$—	$1,341
Equipment purchases under capital leases	$16,086	$123,235	$100,281
Changes in accrued property and equipment purchases	$(23,469)	$16,387	$5,738
Reconciliation of cash, cash equivalents and restricted cash as shown in the consolidated statements of cash flows			
Cash and cash equivalents	$1,894,444	$1,638,413	$988,598
Restricted cash included in prepaid expenses and other current assets	1,698	8,289	9,449
Restricted cash included in other assets	25,733	27,155	29,586
Total cash, cash equivalents and restricted cash	$1,921,875	$1,673,857	$1,027,633

The accompanying notes are an integral part of these consolidated financial statements.

TWITTER, INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 1. The Company

Twitter, Inc. (“Twitter” or the “Company”) was incorporated in Delaware in April 2007, and is headquartered in San Francisco, California. Twitter offers products and services for users, advertisers, developers and platform and data partners.

Note 2. Summary of Significant Accounting Policies

Principles of Consolidation

The consolidated financial statements include the accounts of the Company and its wholly-owned subsidiaries. All significant intercompany accounts and transactions have been eliminated in consolidation.

Prior Period Reclassifications

Certain prior period amounts have been reclassified to conform to the current period presentation.

Use of Estimates

The preparation of the Company’s consolidated financial statements in conformity with generally accepted accounting principles in the United States of America (“GAAP”) requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenue and expenses, as well as related disclosure of contingent assets and liabilities. Actual results could differ materially from the Company’s estimates. To the extent that there are material differences between these estimates and actual results, the Company’s financial condition or operating results will be affected. The Company bases its estimates on past experience and other assumptions that management believes are reasonable based on its knowledge of current events, as well as its expectations about actions it may take in the future, and evaluates these estimates on an ongoing basis.

Revenue Recognition

The Company generates the substantial majority of its revenue from the sale of advertising services with the balance from data licensing and other arrangements.

The Company generates its advertising revenue primarily from the sale of its Promoted Products: (i) Promoted Tweets, (ii) Promoted Accounts and (iii) Promoted Trends. Promoted Tweets and Promoted Accounts are pay-for-performance advertising products or pay on impressions delivered, each priced through an auction. Promoted Trends are featured by geography and offered on a fixed-fee-per-day basis. Advertisers are obligated to pay when a user engages with a Promoted Tweet, follows a Promoted Account, when an impression is delivered, or when a Promoted Trend is displayed. These advertising services may be sold in combination as a bundled arrangement or separately on a stand-alone basis.

For the Company's Promoted Product arrangements, significant judgments are (i) identifying the performance obligations in the contract, (ii) determining the basis for allocating contract consideration to performance obligations, (iii) determining whether the Company is the principal or the agent in arrangements where another party is involved in providing specified services to a customer, and (iv) estimating the transaction price to be allocated for contracts with tiered rebate provisions.

The Company may generate revenue from the sale of certain Promoted Tweets through placement by Twitter of advertiser ads against third-party publisher content. The Company will pay the third-party publisher a revenue share fee for its right to monetize their content. In such transactions, advertisers are contracting to obtain a single integrated advertising service, the Promoted Tweet combined with the third-party publisher content, and the Company obtains control of the third-party publisher content displayed on Twitter that it then combines with the advertiser ads within the Promoted Tweet. Therefore, the Company reports advertising revenue generated from these transactions on a gross basis and records the related third-party content monetization fees as cost of revenue.

The Company also generates advertising revenue by selling services in which the Company places ads on third-party publishers’ websites, applications or other offerings. To fulfill these transactions, the Company purchases advertising inventory from third-party publishers’ websites and applications where the Company has identified the advertisers’ targeted audience and therefore incurs traffic acquisition costs prior to transferring the advertising service to its customers. At such point, the Company has the sole ability to monetize the third-party publishers advertising inventory. In such transactions, the Company obtains control of a right to a service to be performed by the third-party publishers, which gives the Company the ability to direct those publishers to provide the services to the Company's customers on the Company's behalf. Therefore, the Company reports advertising revenue generated from these transactions on a gross basis and records the related traffic acquisition costs as cost of revenue.

Fees for the advertising services above are recognized in the period when advertising is delivered as evidenced by a user engaging with a Promoted Tweet or an ad on a third-party publisher website or application in a manner satisfying the types of engagement selected by the advertisers, such as Tweet engagements (e.g., retweets, replies and likes), website clicks, mobile application installs or engagements, obtaining new followers, or video views, following a Promoted Account, delivery of impressions, or through the display of a Promoted Trend on the Company's platform.

The Company has concluded that its data licensing arrangements, which grant customers a right to Twitter’s intellectual property (“IP”) for a defined period of time, may contain a single performance obligation satisfied at a point in time (“Historical IP”) or over time (“Future IP”), or may contain two or more performance obligations satisfied separately at a point in time (Historical IP) and over time (Future IP). In some of the Company's data licensing arrangements, pricing is a fixed monthly fee over a specified term. In arrangements with a single performance obligation satisfied over time, data licensing revenue is recognized on a straight-line basis over the period in which the Company provides data as the customer consumes and benefits from the continuous data available on an ongoing basis. In arrangements with at least two performance obligations, the Company allocates revenue on a relative basis between the performance obligations based on standalone selling price (“SSP”) and recognizes revenue as the performance obligations are satisfied.

In other data licensing arrangements, the Company charges customers based on the amount of sales they generate from downstream customers using Twitter data. Certain of those royalty-based data licensing arrangements are subject to minimum guarantees. For such arrangements with a minimum guarantee and a single Future IP performance obligation, the Company recognizes revenue for minimum guarantees on a straight-line basis over the period in which the Company provides data. For such arrangements with a minimum guarantee and two or more performance obligations, the Company allocates revenue on a relative basis between the performance obligations based on SSP and recognizes revenue as the performance obligations are satisfied. Royalties in excess of minimum guarantees, if any, are recognized as revenue in the period that the related downstream customer sales using the Company’s licensed data occur, and such amounts have been immaterial to date.

For data licensing arrangements involving two or more performance obligations, the Company uses directly observable standalone transactions to determine SSP of Historical IP. The Company uses standalone transactions and considers all other reasonably available observable evidence to estimate SSP of Future IP.

Other revenue is primarily generated from service fees from transactions completed on the Company's mobile ad exchange. The Company's mobile ad exchange enables buyers and sellers to purchase and sell advertising inventory by matching them in the exchange. The Company has determined it is not the principal in the purchase and sale of advertising inventory in transactions between third-party buyers and sellers on the exchange because the Company does not obtain control of the advertising inventory. The Company reports revenue related to its ad exchange services on a net basis for the fees paid by buyers, net of costs related to acquiring the advertising inventory paid to sellers.

Arrangements involving multiple performance obligations primarily consist of combinations of the Company's pay-for-performance products, Promoted Tweets and Promoted Accounts, which are priced through an auction, and Promoted Trends, which are priced on a fixed-fee-per day, per geography basis. For arrangements that include a combination of these products, the Company develops an estimate of the standalone selling price for these products in order to allocate any potential discount to all performance obligations in the arrangement. The estimate of standalone selling price for pay-for-performance auction based products is determined based on the winning bid price. The estimate of standalone selling price for Promoted Trends is based on Promoted Trends sold on a standalone basis and/or separately priced in a bundled arrangement by reference to a list price by geography, which is updated and approved periodically. For other arrangements involving multiple performance obligations where neither auction pricing nor standalone sales provide sufficient evidence of standalone selling price, the Company estimates standalone selling price using either an adjusted market assessment approach or an expected cost plus margin approach. The Company believes the use of its estimation approach and allocation of the transaction price on a relative standalone selling price basis to each performance obligation results in revenue recognition in a manner consistent with the underlying economics of the transaction and the allocation principle included in Topic 606. The Company has elected to exclude certain sales and indirect taxes from the determination of the transaction price.

Cost of Revenue

Cost of revenue includes infrastructure costs, other direct costs including content costs, amortization expense of technology acquired through acquisitions and amortization of capitalized labor costs for internally developed software, allocated facilities costs, as well as traffic acquisition costs (“TAC”). Infrastructure costs consist primarily of data center costs related to the Company’s co-located facilities, which include lease and hosting costs, related support and maintenance costs and energy and bandwidth costs, as well as depreciation of servers and networking equipment, and personnel-related costs, including salaries, benefits and stock-based compensation, for its operations teams. Content costs are primarily related to payments to providers from whom the Company licenses content, in order to increase engagement on the platform. The fees paid to these content providers may be based on revenues generated, or a minimum guaranteed fee. TAC consists of costs incurred with third parties in connection with the sale to advertisers of advertising products that the Company places on third-party publishers’ websites, applications or other offerings collectively resulting from acquisitions and from the Company’s organically-built advertising network, Twitter Audience Platform.

Stock-Based Compensation Expense

The Company accounts for stock-based compensation expense under the fair value recognition and measurement provisions of GAAP. Stock-based awards granted to employees are measured based on the grant-date fair value.

For service-based restricted stock awards and performance-based restricted stock awards without market conditions, the Company recognizes the compensation expense only for those awards expected to meet the performance and service vesting condition on a straight-line basis over the requisite service period which is generally one year for performance vesting condition awards and up to five years for service vesting condition awards. For performance-based restricted stock awards with market conditions, the Company recognizes the compensation expense on a straight-line basis over the requisite service period regardless of whether the market condition is satisfied, provided that the requisite service has been provided. Starting in 2017, the Company accounts for forfeitures as they occur.

The Company estimates the fair value of stock options granted and stock purchase rights provided under the Company’s employee stock purchase plan using the Black-Scholes option pricing model on the dates of grant. The compensation expense related to stock options and employee stock purchase rights is recognized on a straight-line basis over the requisite service period.

The fair value of performance-based restricted stock awards with market conditions is determined using a Monte Carlo simulation to estimate the grant date fair value.

The Company issues restricted stock subject to a lapsing right of repurchase to continuing employees of certain acquired companies. Since these issuances are subject to post-acquisition employment, the Company accounts for them as post-acquisition stock-based compensation expense. The grant-date fair value of restricted stock granted in connection with acquisitions is recognized as stock-based compensation expense on a straight-line basis over the requisite service period.

Acquisitions

The Company accounts for acquisitions of entities that include inputs and processes and have the ability to create outputs as business combina