

COMPUTER TASK GROUP INC  
Form 10-K  
March 14, 2018

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, 2017

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 No. 1-9410

COMPUTER TASK GROUP, INCORPORATED

(Exact name of registrant as specified in its charter)

New York	16-0912632
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
800 Delaware Avenue, Buffalo, New York	14209
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code: (716) 882-8000

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

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Title of each class	Name of each exchange on which registered
Common Stock, \$.01 par value	The NASDAQ Stock Market LLC

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

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. YES NO

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. YES NO

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

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Website, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). YES NO

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

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

Large accelerated filer	Accelerated filer
Non-accelerated filer	(Do not check if a smaller reporting company) 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 Act). YES NO

The aggregate market value of the registrant's voting and non-voting common equity held by non-affiliates, computed by reference to the price at which the common equity was last sold on the last business day of the registrant's most recently completed second quarter was \$83.5 million. Solely for the purposes of this calculation, all persons who are or may be executive officers or directors of the registrant have been deemed to be affiliates.

The total number of shares of Common Stock of the Registrant outstanding at March 2, 2018 was 15,290,131.

DOCUMENTS INCORPORATED BY REFERENCE

None.

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phases for planning, developing, implementing, managing, and ultimately maintaining the IT solution. A typical client is an organization with large, complex information and data processing requirements. The Company's IT solutions and IT and other staffing services are further described as follows:

**IT Solutions:** CTG's IT solutions typically include engagements with a fixed duration and deliverables that achieve value-based outcomes by applying the right IT solutions to address clients' business needs. These solutions include the implementation and optimization of packaged software applications, the development and deployment of customized software and solutions designed to fit the needs of a specific client or market, and the design and distribution of complex technology components. Additionally, IT Solutions services often include consulting services provided to clients at higher billable rates.

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**IT and Other Staffing:** CTG’s staffing services address a range of IT and business resource needs, from filling specific talent gaps to managing high-volume staffing programs. CTG recruits, retains, and manages IT and other talent for its clients, which are primarily large technology service providers and other companies with multiple locations and a significant need for high-volume external IT, administrative, or other resources.

IT solutions and IT staffing and other revenue as a percentage of consolidated revenue for the three years ended December 31, 2017, 2016, and 2015 is as follows:

	2017	2016	2015
IT solutions	30 %	29 %	33 %
IT and other staffing	70 %	71 %	67 %
Total	100 %	100 %	100 %

## Capabilities

CTG provides a full range of offerings spanning seven service areas that, collectively, address many of our clients’ most pressing technology and business challenges. CTG’s capabilities ensure that our clients are utilizing the right information technology to meet their business needs, maximizing the value from their IT systems, and operating in the most efficient and effective manner.

CTG’s flexible offerings are delivered as an IT solution or IT and other staffing service, or as a strategy or service offering, allowing CTG to meet the unique needs of each client. All offerings are supported with proven program and project management processes and tools that ensure the reliability, transparency, and accountability that CTG clients have come to expect.

CTG provides capabilities in the following service areas:

- **Advisory and Planning:** Supports our clients’ needs to evaluate, select, and design new technology, align technology and business strategy, and optimize technology for improved performance and benefits realization.
- **Application Services:** Provides clients with a full range of technical support to maximize the value of enterprise software, with services that include development, deployment, integration, optimization, and application management and support.
- **Quality Assurance and Testing:** Ensures new and legacy technologies are rigorously verified to meet business requirements and industry standards. CTG delivers full testing programs for clients or can help clients assess, develop, improve, implement, and automate their own programs, as well as provide testing training and certification.
- **IT Services Management (ITSM):** Ensures the right processes, people, and technology are in place to support business goals. Offerings support our clients’ needs to deliver IT services in a more effective and efficient manner and future-proof IT to deal with changing business dynamics and threats with services including help/service desk, ITSM process improvement, technology and infrastructure implementation, disaster recovery and business continuity, and IT infrastructure outsourcing.
- **Information Management:** Helps our clients manage and derive greater value and competitive advantage from data with services that include business intelligence and analytics, enterprise data warehouses, data governance, disclosure management, master data management, and legacy data archiving.
- **Regulatory Compliance:** Assists our clients in understanding, preparing for, managing, and mitigating risk related to government regulations and industry standards. Offerings include audits and assessments, validation, and program management for highly regulated industries such as healthcare and financial services, as well as cross-industry data privacy and security requirements.
- **Strategic Staffing:** Addresses our clients’ needs ranging from staff augmentation and volume staffing to fill specific technical skills gaps, to fully managed solutions to improve recruiting quality, speed, and cost. CTG also provides

comprehensive vendor management and preferred-supplier solutions to help clients achieve significant improvements in managing contractors and technical-support processes.

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## Vertical Markets

The Company promotes a majority of its services through five vertical market focus areas: technology service providers, manufacturing, healthcare (which includes services provided to healthcare providers, health insurers (payers), and life sciences companies), financial services, and energy. The remainder of CTG's revenue is derived from general markets.

CTG's revenue by vertical market as a percentage of consolidated revenue for the three years ended December 31, 2017, 2016, and 2015 is as follows:

	2017	2016	2015
Technology service providers	33.1 %	35.2 %	31.1 %
Manufacturing	24.3 %	24.2 %	25.7 %
Healthcare	16.8 %	18.2 %	23.5 %
Financial services	9.1 %	7.8 %	7.2 %
Energy	5.0 %	5.3 %	5.4 %
General markets	11.7 %	9.3 %	7.1 %
Total	100.0%	100.0%	100.0%

Revenue for the Company's technology service providers vertical market as a percentage of consolidated revenue decreased in 2017 as compared with 2016 due to a decrease in demand from several of the Company's largest clients in its IT and other staffing services business, which are included in this vertical market. Revenue from IBM, our largest client, which is included in this vertical market, decreased in 2017 as compared with 2016. The revenue as a percentage of consolidated revenue increased for 2016 as compared with 2015 due to a change in business mix. Demand from this vertical market began to slow in the 2016 fourth quarter as several large clients cut back on their requirements for our services due to their own challenging financial results.

The revenue in our manufacturing vertical market is primarily generated from several large staffing clients, including Lenovo (through SDI as a vendor manager for Lenovo) which is our second largest client. Revenue from Lenovo decreased slightly in 2017 as compared with 2016. A reduction in revenue in other vertical markets reduced the impact of these losses as a percentage of total revenue. Revenue from Lenovo decreased by approximately \$9.5 million in 2016 as compared with 2015 primarily due to a reduction in requirements from this client.

In 2015, 2016 and 2017, the demand from our healthcare clients decreased. This decrease was a continuation of a reduction related to prior years, and directly related to the U.S. federal government sequestration which cut Medicare reimbursements to hospitals and health systems by 2% starting in April 2013. As a result, the Company's healthcare revenue, primarily from electronic health records (EHR) and related projects, declined in 2014, and has continued to decrease since that time. The Company continues to transform its business from selling primarily EHR projects to advisory and technical services, outsourcing, and staff augmentation.

Revenue for the Company's financial services vertical market as a percentage of consolidated revenue increased in 2017 as compared with 2016 due to a change in business mix. Revenue in this vertical market increased in 2017, while in 2016, revenue from a number of the other vertical markets had larger reductions during this time period which caused the percentage of total revenue for this vertical market to increase.

Revenue for the Company's energy vertical market decreased as a percentage of consolidated revenue in 2017 as compared with 2016, and in 2016 as compared with 2015, as demand in this vertical market declined. Generally, the decrease in the price of oil caused several of our clients to reduce their overall spending, including requirements for IT

services, in each of 2017, 2016 and 2015.

For the year ended December 31, 2017, CTG provided its services to 463 clients in North America and Europe. In North America, the Company operates in the United States and Canada, with greater than 99% of 2017 North American revenue generated in the United States. In Europe, the Company operates in Belgium, Luxembourg, and the United Kingdom. Of total 2017 consolidated revenue of \$301.2 million, approximately 73% was generated in North America and 27% in Europe. Two clients, IBM and Lenovo (through SDI as a vendor manager), each accounted for greater than 10% of CTG's consolidated revenue in 2017.

#### Revenue Recognition and Backlog

The Company recognizes revenue when persuasive evidence of an arrangement exists, when the services have been rendered, when the price is determinable, and when collectibility of the amounts due is reasonably assured. For

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time-and-material contracts, revenue is recognized as hours are incurred and costs are expended. For contracts with progress billing schedules, primarily monthly, revenue is recognized as services are rendered to the client. Revenue for fixed-price contracts is recognized per the proportional method of accounting using an input-based approach. On a given project, actual salary and indirect labor costs incurred are measured and compared against the total estimated costs of such items at the completion of the project. Revenue is recognized based upon the percentage-of-completion calculation of total incurred costs to total estimated costs. The Company infrequently works on fixed-price projects that include significant amounts of material or other non-labor related costs which could distort the percent complete within a percentage-of-completion calculation. The Company's estimate of the total labor costs it expects to incur over the term of the contract is based on the nature of the project and our past experience on similar projects, and includes management judgments and estimates which affect the amount of revenue recognized on fixed-price contracts in any accounting period. Loss on contracts, if any, are recorded at the time it is determined a loss exists on a project.

The Company's revenue from contracts accounted for under time-and-material, progress billing, and percentage-of-completion methods as a percentage of consolidated revenue for the three years ended December 31, 2017, 2016, and 2015 is as follows:

	2017	2016	2015
Time-and-material	85.9 %	86.5 %	88.6 %
Progress billing	10.8 %	10.8 %	9.5 %
Percentage-of-completion	3.3 %	2.7 %	1.9 %
Total	100.0%	100.0%	100.0%

As of December 31, 2017 and 2016, the backlog for fixed-price and all managed-support contracts was approximately \$30.4 million and \$29.7 million, respectively. Approximately 76% or \$23.0 million of the December 31, 2017 backlog is expected to be earned in 2018. Approximately 71% of the \$29.7 million of backlog at December 31, 2016, or \$21.0 million, was earned in 2017. Revenue is subject to slight seasonal variations, with a minor slowdown and a decrease in billable resource utilization in months of high vacation and legal holidays (July, August, and December). Backlog does not tend to be seasonal; however, it does fluctuate based upon the timing of entry into long-term contracts.

### Competition

The IT services market, for both IT solutions and IT staffing services, is highly competitive. The market is also highly fragmented with many providers and no single competitor maintaining clear market leadership. Competition varies by location, the type of service provided, and the client to whom services are provided. The Company's competition comes from four major channels: large national or international companies, including major accounting and consulting firms and large companies headquartered in India; hardware vendors and suppliers of packaged software systems; small local firms or individuals specializing in specific programming services or applications; and from a client's internal IT staff. CTG competes against all four of these channels for its share of the market. The Company believes that to compete successfully it is necessary to have a local geographic presence, offer appropriate IT solutions, provide skilled professional resources, and price its services competitively.

### Intellectual Property

The Company has registered its symbol and logo with the U.S. Patent and Trademark Office and has taken steps to preserve its rights in other countries where it operates. We regard patents, trademarks, copyrights and other intellectual property as important to our success, and we rely on them in the United States and foreign countries to protect our investments in products and technology. Our patents expire at various times, but we believe that the loss or expiration of any individual patent would not materially affect our business. We, like any other company, may be

subject to claims of alleged infringement of the patents, trademarks and other intellectual property rights of third parties from time to time in the ordinary course of business. CTG has entered into agreements with various software and hardware vendors from time to time in the normal course of business, and has capitalized certain costs under software development projects.

#### Employees

CTG's business depends on the Company's ability to attract and retain qualified professional staff to provide services to its clients. The Company has a structured recruiting organization that works with its clients to meet their requirements by recruiting and providing high quality, motivated staff. The Company employs approximately 3,200 employees worldwide, with approximately 2,450 in the United States and Canada and 750 in Europe. Of these employees, approximately 2,850 are IT professionals and 350 are individuals who work in sales, recruiting, delivery,

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administrative and support positions. The Company believes that its relationship with its employees is good. No employees are covered by a collective bargaining agreement or are represented by a labor union. CTG is an equal opportunity employer.

Financial Information About Geographic Areas

The following table sets forth certain financial information relating to the performance of the Company for the three years ended December 31, 2017, 2016, and 2015. This information should be read in conjunction with the audited consolidated financial statements and notes thereto included in Item 8, "Financial Statements and Supplementary Data" included in this report.

	2017	2016	2015
(amounts in thousands)			
<b>Revenue from External Clients:</b>			
United States	\$219,886	\$253,955	\$301,826
Belgium <sup>(1)</sup>	39,347	35,995	35,931
Luxembourg <sup>(2)</sup>	36,954	31,441	28,562
Other European country	4,824	3,193	2,814
Other country	199	309	345
<b>Total foreign revenue</b>	<b>81,324</b>	<b>70,938</b>	<b>67,652</b>
<b>Total revenue</b>	<b>\$301,210</b>	<b>\$324,893</b>	<b>\$369,478</b>
<b>Operating Income (loss):</b>			
United States	\$(158 )	\$(35,739 )	\$8,922
Belgium <sup>(1)</sup>	\$594	\$(577 )	\$(304 )
Luxembourg <sup>(2)</sup>	2,841	2,943	2,720
United Kingdom <sup>(3)</sup>	596	17	(714 )
Other countries	71	9	13
<b>Total foreign operating income</b>	<b>4,102</b>	<b>2,392</b>	<b>1,715</b>
<b>Total operating income (loss)</b>	<b>\$3,944</b>	<b>\$(33,347 )</b>	<b>\$10,637</b>
<b>Total Assets:</b>			
United States	\$83,499	\$91,117	\$133,214
Belgium <sup>(1)</sup>	18,410	14,562	13,904
Luxembourg <sup>(2)</sup>	22,478	18,842	13,988
Other European country	2,360	1,533	1,838
Other countries	888	861	133
<b>Total foreign assets</b>	<b>44,136</b>	<b>35,798</b>	<b>29,863</b>
<b>Total assets</b>	<b>\$127,635</b>	<b>\$126,915</b>	<b>\$163,077</b>

(1) Revenue, operating income, and assets for our Belgium operations have been disclosed separately as they exceed 10% of the consolidated balances in at least one of the years presented.

(2) Revenue, operating income, and total assets for our Luxembourg operations have been disclosed separately as they exceed 10% of the consolidated balance in at least one of the years presented.

(3) Operating income for our United Kingdom operations has been disclosed separately as it exceeds 10% of the consolidated balance in at least one of the years presented.

Available Company Information

The Company's annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and all amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of

1934 (Exchange Act), and reports pertaining to the Company filed under Section 16 of the Exchange Act are available without charge on the Company's website at [www.ctg.com](http://www.ctg.com) as soon as reasonably practicable after the Company electronically files the information with, or furnishes it to, the SEC. The Company's code of ethics (Code of Conduct), committee charters and governance policies are also available without charge on the Company's website at <http://investors.ctg.com/corporate-governance>. If applicable, the Company intends to disclose future amendments to, or waivers from, certain provisions of the Code of Conduct on the Company's website or in a current report on Form 8-K.

### Item 1A. Risk Factors

The following risk factors should be read carefully in connection with evaluating our business and the forward-looking information contained in this Annual Report on Form 10-K. The risk factors below represent what we believe are the known material risk factors with respect to the Company and our business. Any of the following risks could materially adversely affect our business, our operations, the industry in which we operate, our financial position or our future financial results.

Our business depends on the availability of a large number of highly qualified IT professionals, sales and management personnel, and our ability to recruit and retain these individuals.

We actively compete with many other IT service providers for qualified personnel, including professional IT staff, recruiters, sales people, and management. The availability of qualified personnel may affect our future ability to provide services and meet the requirements of our clients. An inability to fulfill client requirements at agreed upon rates due to a lack of available qualified personnel may adversely impact our revenue and operating results in the future.

Increased competition and the bargaining power of our large clients may cause our billing rates to decline, which would have an adverse effect on our revenue and, if we are unable to control our personnel costs accordingly, on our margins and operating results.

We have experienced reductions in the rates we bill some of our larger clients for services due to highly competitive market conditions. Additionally, we actively compete against many other companies for business at both new and existing clients. Billing rate reductions or competitive pressures may lead to a further decline in revenue. When faced with such pressures, if we are unable to make commensurate reductions in our personnel costs, our margins and operating results would be adversely affected.

We derive a significant portion of our revenue from two clients, and a significant reduction in the amount of requirements requested by these clients would have an adverse effect on our revenue and operating results.

IBM and SDI are CTG's two largest clients. CTG provides services to various IBM divisions in a number of locations. SDI acts as a vendor manager for Lenovo, and all of the Company's revenue generated through SDI relates to CTG employees working at various divisions of Lenovo. During the 2017 third quarter, the National Technical Services Agreement (NTS Agreement) with IBM was extended for two years and now expires on December 31, 2019. In 2017, 2016, and 2015, IBM accounted for \$76.4 million or 25.4%, \$98.4 million or 30.3%, and \$99.2 million or 26.9% of the Company's consolidated revenue, respectively. SDI accounted for \$34.2 million or 11.4%, \$34.5 million or 10.6%, and \$44.0 million or 11.9% of the Company's consolidated revenue, respectively, during these periods. The Company's accounts receivable from IBM at December 31, 2017 and 2016 totaled \$21.5 million and \$28.0 million, respectively, and accounts receivable from SDI totaled \$4.7 million and \$5.6 million, respectively.

During the 2016 third quarter, the Company was informed by IBM that there would be significant reductions in both requirements and billable rates for certain of the employees provided to this client beginning in the 2016 fourth quarter. Originally, these employee reductions could have totaled as much as 40% of the revenue earned from IBM. However, CTG was able to negotiate to retain a number of these requirements, although many of the retained employees were subject to reductions in billable rates. If IBM or Lenovo were to significantly reduce their requirements for the Company's services in future periods, our revenue and operating results would be adversely affected.

Our client contracts generally have a short term or are terminable on short notice, and a significant number of failures to renew contracts in place, or early terminations or renegotiations of our existing client contracts could adversely affect our results of operations.

Our clients typically retain us on a non-exclusive, engagement-by-engagement basis, rather than under exclusive long-term contracts. We performed 85.9% of our services on a time-and-materials basis during 2017. As such, our clients generally have the right to terminate a contract with us upon written notice without the payment of any financial penalty. Client projects may involve multiple engagements or stages, and there is a risk that a client may choose not to retain us for additional stages of a project, or that a client will cancel or delay additional planned engagements. These terminations, cancellations or delays could result from factors that are beyond our control and are unrelated to our work product or the progress of the project, but could be related to business or financial conditions of the client, changes in client strategies or the economy in general. When contracts are terminated, we lose the anticipated future revenue and we may not be able to eliminate the associated costs required to support those contracts in a timely manner. Consequently, our operating results in subsequent periods may be lower than expected. Our clients can cancel or reduce the scope of their



engagements with us on short notice. If they do so, we may be unable to reassign our professionals to new engagements without delay. The cancellation or reduction in scope of an engagement could, therefore, reduce the utilization rate of our professionals, which would have a negative impact on our business, financial condition, and results of operations. As a result of these and other factors, our past financial performance should not be relied on as a guarantee of similar or improved future performance. Due to these factors, we believe that our results from operations in the future may fluctuate from period to period.

The introduction of new IT services or changes in client requirements for IT services may render our existing IT Solutions or IT Staffing offerings obsolete or unnecessary, which, if we are unable to keep pace with these corresponding changes, could have an adverse effect on our business.

Our success depends, in part, on our ability to implement and deliver IT Solutions or IT and other staffing services that anticipate and keep pace with rapid and continuing changes in technology, industry standards and client preferences and requirements. We may not be successful in anticipating or responding to these developments on a timely basis, and our offerings may not be successful in the marketplace. Also, services, solutions and technologies developed by our competitors may make our solutions or staffing offerings uncompetitive or obsolete. Any one of these circumstances could have a material adverse effect on our ability to obtain and successfully complete client engagements.

We could be subject to liability and damage to our reputation resulting from cyber attacks or data breaches.

Cyber risks for companies providing information technology (IT) and professional services, especially in healthcare-related and financial services industries, continue to increase. This increase in risk may be attributed to the value of intellectual property, the value of personal information or data used for identity theft and fraud, the increasing sophistication of attacks, the variety of threat actors and their motives such as organized crime, hackers, terrorists, activists, insider threats, foreign governments, and third parties, and the reliance on electronic communications, mobile technologies, cloud-based resources, smart devices, and emerging technologies. The Company's operations, business, and its customers rely on the secure processing, transmission, storage and availability of information, services, and resources provided by its IT environments. The Company's complex IT environments support a variety of technologies, industries, services, delivery teams, and clients globally.

Although the Company has not experienced any prior material data breaches or cyber security incidents, its environments may be impacted by cyber attacks or cyber security incidents caused via the aforementioned threat actors or the Company's personnel. These cyber security incidents could result in information loss, result in the disruption of the Company's internal and client-facing operations and services, adversely affect its adherence with regulatory requirements, or result in a data breach. Information losses and data breaches could include the unauthorized disclosure, misuse, loss, and destruction of both the Company's and its clients' intellectual property, financial information, or other regulated or privacy-related information, including but not limited to United States-designated personally identifiable information (PII), personal data under the European General Data Protection Directive (GDPR), and protected health information (PHI) under the United States Health Insurance Portability and Accountability Act of 1996 (HIPAA).

The Company's failure to protect sensitive data and reasonably address the requirements of regulated data under its control could result in reputational damage, fines and penalties, litigation costs, external investigations, compensation costs including reimbursement and monetary awards, and/or additional compliance costs which could have a material, adverse impact on the Company's operations. It could also have an adverse impact on the Company's ability to maintain and execute new contracts with clients that produce or work with similar data, and make it more difficult to retain and recruit qualified personnel to perform its services in the future. As the cyber threat landscape continues to evolve or the Company's cyber risk profile changes, it may be required to expend additional resources to implement new or enhance existing risk mitigation strategies.

The foreign currency exchange, legislative, tax, regulatory and economic risks associated with international operations could have an adverse effect on our operating results if we are unable to mitigate or hedge these risks.

We have operations in the United States and Canada in North America, in Belgium, Luxembourg, and the United Kingdom in Europe, and in India. Although our foreign operations conduct their business in their local currencies, these operations are subject to their own currency fluctuations, legislation, employment and tax law changes, and economic climates. These factors as they relate to our foreign operations are different than those of the United States. Although we actively manage these foreign operations with local management teams, our overall operating results may be negatively affected by local economic conditions, changes in foreign currency exchange rates, or tax, regulatory or other economic changes beyond our control.

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Government cuts in healthcare programs, such as Medicare, and delays in legislative or regulatory healthcare mandates could cause a reduction in IT spending by our healthcare clients, which could materially and adversely affect our revenue and results of operations.

The Company's growth efforts have previously been primarily focused in the healthcare market. Growth in this market depends on continued spending by our healthcare clients on IT projects. Cuts in government healthcare programs, such as sequestration, which cut Medicare reimbursements to hospitals and health systems beginning in April 2013, may result in reduced expenditures by our healthcare clients on IT projects. If additional government cuts in healthcare programs were to occur, whether due to the failure of Congress to adopt a budget, pass appropriations bills or raise the U.S. debt ceiling or for other reasons, there may be delays, reductions or cessation of funding to our clients, which could cause our clients to purchase less IT services from us, which could materially and adversely affect our revenue and results of operations.

In addition, delays in implementation of legislative or regulatory healthcare mandates could adversely affect the IT spending by our healthcare clients to implement such mandates. If the implementation of existing or contemplated legislative or regulatory healthcare mandates are deferred, the resulting reduction in IT spending by our healthcare clients could materially and adversely affect our revenue and results of operations.

Changes in government regulations and laws affecting the IT services industry, and the industries in which our clients operate, including accounting principles and interpretations, and the taxation of domestic operations could adversely affect our results of operations.

Changing laws, regulations and standards relating to corporate governance and public disclosure, including the Sarbanes-Oxley Act of 2002, the Dodd-Frank Wall Street Reform and Consumer Protection Act, the Patient Protection and Affordable Care Act (PPACA), and new SEC regulations, create uncertainty for companies such as ours. These new or updated laws, regulations and standards are subject to varying interpretations which, in many instances, is due to their lack of specificity. As a result, the application of these new standards and regulations in practice may evolve over time as new guidance is provided by regulatory and governing bodies. This could result in continuing uncertainty regarding compliance matters and higher costs necessitated by ongoing revisions to disclosure and governance practices. We are committed to maintaining high standards of corporate governance and public disclosure. As a result, our efforts to comply with evolving laws, tax regulations and other standards have resulted in, and are likely to continue to result in, increased general and administrative expenses and a diversion of management time and attention from revenue-generating activities to compliance activities. In particular, our continuing efforts to comply with Section 404 of the Sarbanes-Oxley Act of 2002 and the related regulations regarding our required assessment of our internal controls over financial reporting and our independent auditors' audit of internal control require the commitment of significant internal, financial and managerial resources.

The Financial Accounting Standards Board (FASB), the SEC, and the Public Company Accounting Oversight Board (PCAOB) or other accounting rule making authorities have issued and may continue to issue new accounting rules or auditing standards that are different than those that we presently apply to our financial results. Such new accounting rules or auditing standards could require significant changes from the way we currently report our financial condition, results of operations or cash flows.

U.S. generally accepted accounting principles have been the subject of frequent changes in interpretations. As a result of the enactment of the Sarbanes-Oxley Act of 2002 and the review of accounting policies by the SEC as well as by national and international accounting standards bodies, the frequency of future accounting policy changes may accelerate. Such future changes in financial accounting standards may have a significant effect on our reported results of operations, including results of transactions entered into before the effective date of the changes.

We are subject to income and other taxes in the United States (federal and state) and numerous foreign jurisdictions. Our provisions for income and other taxes and our tax liabilities in the future could be adversely affected by numerous

factors. These factors include, but are not limited to, income before taxes being lower than anticipated in countries with lower statutory tax rates and higher than anticipated in countries with higher statutory tax rates, changes in the valuation of deferred tax assets and liabilities, and changes in various federal, state and international tax laws, regulations, accounting principles or interpretations thereof, which could adversely impact our financial condition, results of operations and cash flows in future periods. Due to the enactment of the Tax Cuts and Jobs Act, the Company recorded an additional \$1.7 million of tax expense upon enactment. There could be additional estimates related to the Tax Cuts and Jobs Act that could adversely affect our future financial position.

Existing and potential clients may outsource or consider outsourcing their IT requirements to foreign countries in which we may not currently have operations, which could have an adverse effect on our ability to obtain new clients or retain existing clients.

In recent years, more companies have started using, or are considering using, low-cost offshore outsourcing centers to perform technology-related work and complete projects. Currently, we have partnered with clients to perform services outside of North America to mitigate and reduce this risk to our Company. However, the risk of additional outsourcing of IT solutions overseas to countries where we do not have operations could have a material, negative impact on our future operations.

Decreases in demand for IT Solutions and IT and Other Staffing services in the future would cause an adverse effect on our revenue and operating results.

The Company's revenue and operating results are significantly affected by changes in demand for its services. In the past, when the world economy deteriorated, such as in 2008, there was a significant decline in demand for the Company's services which negatively affected the Company's revenue and operating results as compared with prior years. Declines in demand for the requirement for our IT services in 2018 or future years would adversely affect our operating results as it has in the past.

The IT services industry is highly competitive and fragmented, which means that our clients have a number of choices for providers of IT services and we may not be able to compete effectively.

The market for our services is highly competitive. The market is fragmented, and no company holds a dominant position. Consequently, our competition for client requirements and experienced personnel varies significantly by geographic area and by the type of service provided. Some of our competitors are larger and have greater technical, financial, and marketing resources and greater name recognition than we have in the markets we collectively serve. In addition, clients may elect to increase their internal IT systems resources to satisfy their custom software development and integration needs. Finally, our industry is being impacted by the growing use of lower-cost offshore delivery capabilities (primarily India and other parts of Asia). There can be no assurance that we will be able to continue to compete successfully with existing or future competitors or that future competition will not have a material adverse effect on our results of operations and financial condition.

If we are unable to collect our receivables or unbilled services, our results of operations, financial condition and cash flows could be adversely affected.

Our business depends on our ability to successfully obtain payment from our clients of the amounts they owe us for work performed. We evaluate the financial condition of our clients and typically bill and collect on reasonable cycles. We might, however, not accurately assess the creditworthiness of our clients, or macroeconomic conditions could also result in financial difficulties for our clients, including bankruptcy and insolvency. In certain industries, some clients have requested longer payment terms, which has adversely affected, and may continue to adversely affect, our cash flows. The timely collection of client balances also depends on our ability to complete our contractual commitments as required. If we are unable to meet our commitments or bill our clients on a timely basis, our results of operations and cash flows could be adversely affected. We have established allowances for losses of receivables and unbilled services where we deem the amounts to be uncollectible. The uncollectible amounts due to the Company from clients could differ from those that we currently anticipate.

Our share price could fluctuate and be difficult to predict.

Our share price has fluctuated in the past and could continue to fluctuate in the future in response to various factors, both external and internal. These factors include:

• changes in macroeconomic or political factors unrelated to our business in the geographies in which we operate;  
• general or industry-specific market conditions or changes in financial markets;  
• our failure to meet our growth or financial objectives (including revenue, operating margins, and earnings per share targets);  
• our ability to generate cash flow to return cash to our shareholders at historical levels or levels expected by our shareholders;

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announcements by us or competitors about developments in our business or prospects; and projections or speculation about our business by the media or investment analysts.

If we repatriate our cash balances from our foreign operations, we may be subject to additional tax liabilities.

We earn a portion of our operating income outside of the United States, and any repatriation or deemed repatriation of funds currently held in foreign jurisdictions to the United States may result in additional tax liabilities for the Company. In addition, there have been changes to the tax laws in the United States that significantly impact how United States-based multinational corporations are taxed on foreign earnings. Any further changes in these tax laws could have a material adverse impact on our tax expense and cash flows.

Ineffective internal controls could impact the Company's business and operating results.

The Company's internal control over financial reporting may not prevent or detect misstatements because of the inherent limitations of internal controls, including the possibility of human error, the circumvention or overriding of controls, poorly designed or ineffective controls, or fraud. Internal controls that are deemed to be effective can provide only reasonable assurance with respect to the preparation and fair presentation of the Company's financial statements. If the Company fails to maintain the adequacy of its internal controls, including the failure to implement new or improve existing controls, or fails to properly execute or properly test these controls, the Company's business and operating results could be negatively impacted and the Company could fail to meet its financial reporting obligations.

Changing economic conditions and the effect of such changes on accounting estimates could have a material impact on our results of operations.

The Company has also made a number of estimates and assumptions relating to the reporting of its assets and liabilities and the disclosure of contingent assets and liabilities to prepare its consolidated financial statements pursuant to the rules and regulations of the SEC and other accounting rulemaking authorities. Such estimates primarily relate to the valuation of stock options for recording equity-based compensation expense, allowances for doubtful accounts receivable, investment valuation, discount rates associated with pension plans, incurred but not recorded claims related to the Company's self-insured medical plan, valuation allowances for deferred tax assets, legal matters, other contingencies and estimates of progress toward completion and direct profit or loss on contracts, as applicable. As future events and their effects cannot be determined with precision, actual results could differ from these estimates. Changes in the economic climates in which the Company operates may affect these estimates and will be reflected in the Company's financial statements in the event they occur. Such changes could result in a material impact on the Company's results of operations.

Risks to the Company from acquisitions include integration challenges, disruptions of the Company's core business, a failure to achieve objectives, and the assumption of liabilities.

The Company regularly evaluates acquisitions to aid the Company's growth in revenue and profits by expanding the services the Company offers in the geographies in which the Company operates, and its client base. On February 15, 2018, the Company acquired 100% of the equity of Soft Company. Soft Company, located in Paris, France, is an IT consulting company that specializes in providing IT services to finance, insurance, telecom, and media services companies. Acquisitions often present significant challenges and risks relating to the integration of the business into the Company, and there can be no assurances that the Company will manage future acquisitions successfully, that the Company's core business will not be significantly disrupted after an acquisition is finalized, or that strategic acquisition opportunities will be available to the Company on acceptable terms. The risks from an acquisition include the Company failing to achieve strategic objectives and anticipated revenue and profit improvements, borrowing a significant amount of money to fund the acquisitions which creates financial stress for the Company's operations, as well as failing to retain the key personnel of the acquired business. Finally, the assumption of liabilities related to litigation or other legal proceedings involving the acquired business may present a significant risk.

We may require additional capital to support our business, and this capital may not be available to us on acceptable terms, if at all.

On December 21, 2017, the Company entered into a credit and security agreement, which provides for a three-year revolving credit facility in an aggregate principal amount of \$45.0 million, including a sublimit of \$10.0 million for letters of credit and a \$10.0 million sublimit for swing line loans. At December 31, 2017, we had \$4.4 million of borrowings

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outstanding under our revolving credit line. We may be dependent on our revolving credit facility to meet working capital and operational requirements, and access to our facility is dependent on, among other things, compliance with applicable covenants, including fixed charge coverage ratio, consolidated earnings before interest, taxes, depreciation, and amortization (EBITDA) targets, and a limit on annual expenditures for property, plant, equipment, and capitalized software. The fixed charge coverage ratio is only tested if availability on a measurement date is below a threshold. The amount available for borrowing under the credit facility could be significantly reduced due to poor operational performance, or other factors. Any loss or material reduction of our ability to access funds under the credit facility could materially and negatively impact our liquidity.

Actions of activist stockholders could cause us to incur substantial costs, divert management's and the board's attention and resources, and have an adverse effect on our business and stock price.

From time to time, we may be subject to proposals by stockholders urging us to take certain corporate actions. If activist stockholder activities ensue, our business could be adversely affected as responding to proxy contests and reacting to other actions by activist stockholders can be costly and time-consuming, disrupt our operations, and divert the attention of management and our board of directors, all of which could interfere with our ability to execute our strategic plan. We may be required to retain the services of various professionals to advise us on activist stockholder matters, including legal, financial and communications advisors, the costs of which may negatively impact our future financial results. In addition, the perceived uncertainties as to our future direction, strategy or leadership created as a consequence of activist stockholder initiatives may result in the loss of potential business opportunities, harm our ability to attract new investors, customers, and employees, and cause our stock price to experience periods of volatility or stagnation.

#### Item 1B. Unresolved Staff Comments

None.

#### Item 2. Properties

At December 31, 2017, the Company owned its headquarters building at 800 Delaware Avenue, and a corporate administrative building at 700 Delaware Avenue, both located in Buffalo, New York. These buildings are operated by CTG of Buffalo, a subsidiary of the Company which is part of the Company's North American operations. The corporate headquarters consists of approximately 48,000 square feet and is occupied by corporate administrative operations. The corporate administrative building consists of approximately 42,000 square feet. During the 2017 third and fourth quarter, the Company consolidated its corporate administrative operations into its corporate headquarters building at 800 Delaware Avenue. At December 31, 2017, these properties were not used as collateral as part of the Company's existing revolving credit agreement.

The Company sold its corporate administrative building in February 2018 for \$1.8 million, and as the book value was \$1.6 million, recorded an immaterial gain on the sale.

All of the remaining Company locations, totaling approximately 20 sites, are leased facilities. Most of these facilities are located in the United States, with approximately four of these locations in Europe in the countries of Belgium, Luxembourg and the United Kingdom, where our European operations are located, and one in Hyderabad, India. These facilities generally serve as sales and support offices and their size varies with the number of people employed

at each office, ranging from 300 to 26,000 square feet. The Company's lease terms vary from periods of less than a year to five years and typically have flexible renewal options. The Company believes that its presently owned and leased facilities are adequate to support its current and anticipated future needs.

Item 3. Legal Proceedings

The Company and its subsidiaries are involved from time to time in various legal proceedings arising in the ordinary course of business. Although the outcome of lawsuits or other proceedings involving the Company and its subsidiaries cannot be predicted with certainty and the amount of any liability that could arise with respect to such lawsuits or other proceedings cannot be predicted accurately, management does not expect these matters, if any, to have a material adverse effect on the financial position, results of operations, or cash flows of the Company.

Item 4. Mine Safety Disclosures  
Not applicable.

## PART II

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

### Stock Market Information

The Company's common stock is traded on The NASDAQ Stock Market LLC under the symbol CTG. The following table sets forth the high and low sales prices for the Company's common stock for each quarter of the previous two years.

Stock Price	High	Low
Year Ended December 31, 2017		
Fourth Quarter	\$5.59	\$4.90
Third Quarter	\$6.04	\$5.04
Second Quarter	\$6.30	\$5.25
First Quarter	\$6.33	\$4.20
Year Ended December 31, 2016		
Fourth Quarter	\$4.99	\$3.87
Third Quarter	\$5.54	\$4.42
Second Quarter	\$5.69	\$4.90
First Quarter	\$6.71	\$4.70

On March 2, 2018, there were 2,022 holders of record of the Company's common shares. The Company paid a quarterly dividend for the first three quarters of 2016. The dividend was suspended in the 2016 fourth quarter and no dividends were paid in 2017. At December 31, 2017, as per the Company's revolving line of credit, the Company is required to meet certain financial covenants in order to pay dividends. The Company was in compliance with these financial covenants at both December 31, 2017 and 2016. For additional information regarding these financial covenants, see Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations - Financial Condition and Liquidity." The determination of the timing, amount and the payment of dividends, if any, on the Company's common stock in the future is at the discretion of the Board of Directors and will depend upon, among other things, the Company's profitability, liquidity, financial condition, capital requirements, and compliance with the covenants under the Company's revolving credit agreement.

For information concerning common stock issued in connection with the Company's equity compensation plans, see Item 12, "Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters."

### Issuer Purchases of Equity Securities

During the 2016 fourth quarter, the Company's Board of Directors authorized the repurchase of up to \$10.0 million of its stock over the next two years. This share repurchase authorization replaces the Company's previous share repurchase program. During the 2017 fourth quarter, the Company's Board of Directors approved a \$10.0 million

addition to the stock repurchase program to bring the authorization to \$20.0 million in total. As of February 16, 2018, the Company had repurchased approximately \$7.3 million of shares pursuant to the authorization. On February 15, 2018, the Company announced its intent to commence in the future a modified “Dutch auction” tender offer to repurchase up to 10% of its outstanding shares of common stock. The information below does not include shares withheld by or surrendered to the Company either to satisfy the exercise cost for the cashless exercise of employee stock options, or to satisfy tax withholding obligations associated with employee equity awards as the number of shares is minor.

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Period	Total	Average	Total Number	Maximum
	Number	Price	of Shares	Dollar
			Purchased as	Amount
			Part of Publicly	that May
			Announced Plans	Yet
			or Programs	be
				Purchased
				Under the
				Plans
				Or Programs
September 30 - October 27	26,266	\$ 5.36	26,266	\$13,820,929
October 28 - November 24	132,542	\$ 5.10	132,542	\$13,144,383
November 25 - December 31	93,598	\$ 5.17	93,598	\$12,660,719
Total	252,406	\$ 5.15	252,406	

\* Excludes broker commissions

Company Performance Graph

The following graph displays a five-year comparison of cumulative total shareholder returns for the Company's common stock, the S&P 500 Index, and the Dow Jones U.S. Computer Services Index, assuming a base index of \$100 at the end of 2012. The cumulative total return for each annual period within the five years presented is measured by dividing (1) the sum of (A) the cumulative amount of dividends for the period, assuming dividend reinvestment, and (B) the difference between the Company's share price at the end and the beginning of the period by (2) the share price at the beginning of the period. The calculations were made excluding trading commissions and taxes.

	Base	Indexed Returns				
	Period	Years Ending				
	December	December	December	December	December	December
	2012	2013	2014	2015	2016	2017
Computer Task Group, Inc.	\$ 100.00	\$104.36	\$ 53.82	\$ 38.70	\$ 25.52	\$ 30.92
S&P 500 Index	\$ 100.00	\$132.39	\$ 150.51	\$ 152.59	\$ 170.84	\$ 208.14
Dow Jones U.S. Computer Services Index	\$ 100.00	\$106.26	\$ 100.62	\$ 98.18	\$ 115.31	\$ 127.33

The information included under this section entitled "Company Performance Graph" is deemed not to be "soliciting material" or "filed" with the SEC, is not subject to the liabilities of Section 18 of the Exchange Act, and shall not be deemed incorporated by reference into any of the filings previously made or made in the future by the Company under the Exchange Act or the Securities Act of 1933, except to the extent the Company specifically incorporates any such information into a document that is filed.

## Item 6. Selected Financial Data

## Consolidated Summary—Five-Year Selected Financial Information

The selected operating data and financial position information set forth below for each of the years in the five-year period ended December 31, 2017 has been derived from the Company's audited consolidated financial statements. This information should be read in conjunction with the audited consolidated financial statements and notes thereto included in Item 8, "Financial Statements and Supplementary Data" included in this report.

	2017	2016	2015	2014	2013
(amounts in millions, except per-share data)	(1)	(2)	(3)	(4)	
<b>Operating Data</b>					
Revenue	\$301.2	\$324.9	\$369.5	\$393.3	\$419.0
Operating income (loss)	\$3.9	\$(33.3)	\$10.6	\$17.2	\$24.7
Net income (loss)	\$0.8	\$(34.6)	\$6.5	\$10.4	\$15.7
Basic net income (loss) per share	\$0.05	\$(2.22)	\$0.42	\$0.68	\$1.02
Diluted net income (loss) per share	\$0.05	\$(2.22)	\$0.41	\$0.64	\$0.92
Cash dividend per share	\$—	\$0.18	\$0.24	\$0.24	\$0.20
<b>Financial Position</b>					
Working capital	\$50.8	\$53.7	\$53.0	\$69.2	\$67.5
Total assets	\$127.6	\$126.9	\$163.1	\$170.2	\$174.4
Long-term debt	\$4.4	\$4.7	\$1.2	\$—	\$—
Shareholders' equity	\$78.6	\$78.8	\$117.7	\$111.0	\$113.8

(1) During 2017, the Company incurred \$1.2 million of unexpected costs associated with the Company's self-insured medical plan, and \$0.8 million for severance charges for former executives, which reduced operating income by a total of \$2.0 million. Additionally, the Company was impacted by the enactment of the Tax Cuts and Jobs Act, which resulted in the Company recording an additional \$1.7 million of tax expense upon enactment. Finally, the Company recorded a \$0.4 million gain from non-taxable life insurance for a former executive that passed away in 2017. These charges decreased net income by a net amount of \$2.5 million and basic and diluted loss per share by \$0.17.

(2) During 2016, the Company incurred \$37.3 million related to goodwill impairment charges, and \$1.5 million for severance charges for two former executives, which reduced operating income by a total of \$38.8 million. These charges increased net loss by \$38.3 million and basic and diluted loss per share by \$2.45.

(3) During 2015, the Company incurred approximately \$1.1 million of costs relating to the disposal of one of the Company's capitalized software projects. The Company also incurred approximately \$1.2 million of costs relating to severance charges in Europe. In total, these costs reduced operating income by \$2.3 million, net income by \$1.2 million, and basic and diluted net income per share by \$0.08.

Included in net income is \$0.2 million from a non-taxable life insurance gain for a former executive that passed away in 2015.

- (4) During 2014, the Company incurred \$2.0 million in costs associated with the death of the Company's Chairman and CEO under his employment agreement. The Company also recorded an impairment charge totaling \$1.5 million for capitalized software costs associated with one of its IT solutions. In total, these costs reduced operating income by \$3.5 million, net income by \$2.2 million, and basic and diluted net income per share by \$0.14 and \$0.13, respectively.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations  
Forward-Looking Statements

This annual report on Form 10-K contains forward-looking statements made by the management of Computer Task Group, Incorporated (CTG, the Company or the Registrant) that are subject to a number of risks and uncertainties. These forward-looking statements are based on information as of the date of this report. The Company assumes no obligation to update these statements based on information from and after the date of this report. Generally, forward looking statements include words or phrases such as “anticipates,” “believes,” “estimates,” “expects,” “intends,” “plans,” “projects,” “could,” “may,” “might,” “should,” “will” and words and phrases of similar impact. The forward-looking statements include, but are not limited to, statements regarding future operations, industry trends or conditions and the business environment, and statements regarding future levels of or trends in business strategy and expectations, new business opportunities, cost control initiatives, business wins, market demand, revenue, operating expenses, capital expenditures, and financing. The forward-looking statements are made pursuant to safe harbor provisions of the Private Securities Litigation Reform Act of 1995. Numerous factors could cause actual results to differ materially from those in the forward-looking statements, including the following: (i) the availability to CTG of qualified professional staff, (ii) domestic and foreign industry competition for clients and talent, including technical, sales and management personnel, (iii) increased bargaining power of large clients, (iv) the Company's ability to protect confidential client data, (v) the partial or complete loss of the revenue the Company generates from International Business Machines Corporation (IBM) and SDI International (SDI), (vi) the uncertainty of clients' implementations of cost reduction projects, (vii) the effect of healthcare reform and initiatives, (viii) the mix of work between staffing and solutions, (ix) currency exchange risks, (x) risks associated with operating in foreign jurisdictions, (xi) renegotiations, nullification, or breaches of contracts with clients, vendors, subcontractors or other parties, (xii) the impact of current and future laws and government regulation, as well as repeal or modification of such, affecting the information technology (IT) solutions and staffing industry, taxes and the Company's operations in particular, (xiii) industry and economic conditions, including fluctuations in demand for IT services, (xiv) consolidation among the Company's competitors or clients, (xv) the need to supplement or change our IT services in response to new offerings in the industry or changes in client requirements for IT products and solutions, (xvi) the risks associated with acquisitions, (xvii) actions of activist shareholders, and (xviii) the risks described in Item 1A of this annual report on Form 10-K and from time to time in the Company's reports filed with the Securities and Exchange Commission (SEC).

#### Industry Trends

The market demand for the Company's services is heavily dependent on IT spending by major corporations, organizations and government entities in the markets and regions that we serve. The pace of technology advances and changes in business requirements and practices of our clients all have a significant impact on the demand for the services that we provide. Competition for new engagements and pricing pressure has been strong. In 2017 there was a further overall decline in demand for our services as compared with 2016 and 2015 as many of our healthcare clients did not begin new projects when existing projects ended due to their capital constraints. Additionally, the demand for our IT staffing and other services from certain of our large staffing clients diminished throughout 2017.

The Company primarily operates in one industry segment, providing IT services to its clients. These services include IT solutions and IT and other staffing. With IT solutions services, we generally take responsibility for the deliverables on a project and the services may include high-end consulting. When providing IT and other staffing services, we typically supply personnel to our clients who then, in turn, take their direction from the client's managers. The Company at times provides administrative or warehouse employees to clients to supplement the IT staffing resources we place at those clients.



IT solutions and IT and other staffing revenue as a percentage of consolidated revenue for the years ended December 31, 2017, 2016, and 2015 is as follows:

	2017	2016	2015
IT solutions	30 %	29 %	33 %
IT and other staffing	70 %	71 %	67 %
Total	100 %	100 %	100 %

The Company promotes a majority of its services through five vertical market focus areas: technology service providers, manufacturing, healthcare (which includes services provided to healthcare providers, health insurers (payers), and life sciences companies), financial services, and energy. The remainder of CTG's revenue is derived from general markets.

CTG's revenue by vertical market as a percentage of consolidated revenue for the years ended December 31, 2017, 2016, and 2015 is as follows:

	2017	2016	2015
Technology service providers	33.1 %	35.2 %	31.1 %
Manufacturing	24.3 %	24.2 %	25.7 %
Healthcare	16.8 %	18.2 %	23.5 %
Financial services	9.1 %	7.8 %	7.2 %
Energy	5.0 %	5.3 %	5.4 %
General markets	11.7 %	9.3 %	7.1 %
Total	100.0%	100.0%	100.0%

The IT services industry is extremely competitive and characterized by continuous changes in client requirements and improvements in technologies. Our competition varies significantly by geographic region, as well as by the type of service provided. Many of our competitors are larger than CTG, and have greater financial, technical, sales and marketing resources. In addition, the Company frequently competes with a client's own internal IT staff. Our industry is being impacted by the growing use of lower-cost offshore delivery capabilities (primarily India and other parts of Asia). There can be no assurance that we will be able to continue to compete successfully with existing or future competitors or that future competition will not have a material adverse effect on our results of operations and financial condition.

#### Revenue Recognition

The Company recognizes revenue when persuasive evidence of an arrangement exists, when the services have been rendered, when the price is determinable, and when collectibility of the amounts due is reasonably assured. For time-and-material contracts, revenue is recognized as hours are incurred and costs are expended. For contracts with progress billing schedules, primarily monthly, revenue is recognized as services are rendered to the client. Revenue for fixed-price contracts is recognized per the proportional method of accounting using an input-based approach. On a given project, actual salary and indirect labor costs incurred are measured and compared against the total estimated costs of such items at the completion of the project. Revenue is recognized based upon the percentage-of-completion calculation of total incurred costs to total estimated costs. The Company infrequently works on fixed-price projects that include significant amounts of material or other non-labor related costs which could distort the percent complete within a percentage-of-completion calculation. The Company's estimate of the total labor costs it expects to incur over the term of the contract is based on the nature of the project and our past experience on similar projects, and includes management judgments and estimates which affect the amount of revenue recognized on fixed-price contracts in any accounting period.

The Company's revenue from contracts accounted for under time-and-material, progress billing, and percentage-of-completion methods as a percentage of consolidated revenue for the years ended December 31, 2017, 2016, and 2015 is as follows:

	2017	2016	2015
Time-and-material	85.9 %	86.5 %	88.6 %
Progress billing	10.8 %	10.8 %	9.5 %
Percentage-of-completion	3.3 %	2.7 %	1.9 %
Total	100.0%	100.0%	100.0%



## Results of Operations

The table below sets forth percentage information calculated as a percentage of consolidated revenue as reported on the Company's consolidated statements of operations as included in Item 8, "Financial Statements and Supplementary Data" in this report.

Year Ended December 31, (percentage of revenue)	2017	2016	2015
Revenue	100.0%	100.0%	100.0%
Direct costs	81.4 %	81.8 %	81.8 %
Selling, general and administrative expenses	17.3 %	17.0 %	15.3 %
Goodwill impairment charges	—	11.5 %	— %
Operating income (loss)	1.3 %	(10.3)%	2.9 %
Interest and other income (expense), net	0.1 %		