

Medidata Solutions, Inc.
Form 10-Q
October 30, 2018
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-Q

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

For the quarterly period ended September 30, 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: 001-34387

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

Delaware 13-4066508
(State or other jurisdiction of (I.R.S. Employer
incorporation or organization) Identification No.)

350 Hudson Street, 9th Floor 10014
New York, New York
(Address of principal executive offices) (Zip Code)
(212) 918-1800
(Registrant's telephone number, including area code)

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 Web site, 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 whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer", "accelerated filer", "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act. (Check one)

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 Exchange Act). Yes No

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As of October 26, 2018, the registrant had 61,190,452 shares of common stock outstanding.

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PART I - FINANCIAL INFORMATION

Item 1. Financial Statements (Unaudited)

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MEDIDATA SOLUTIONS, INC.

CONDENSED CONSOLIDATED BALANCE SHEETS (Unaudited)

	September 30, 2018	December 31, 2017
	(Amounts in thousands, except per share data)	
ASSETS		
Current assets:		
Cash and cash equivalents	\$83,496	\$ 237,325
Marketable securities	115,083	246,967
Accounts receivable, net of allowance for doubtful accounts of \$1,642 and \$1,454, respectively	163,180	110,685
Prepaid commission expense	18,422	12,404
Prepaid expenses and other current assets	27,898	33,636
Total current assets	408,079	641,017
Restricted cash	5,532	5,518
Furniture, fixtures and equipment, net	96,753	88,091
Marketable securities – long-term	19,878	179,041
Goodwill	215,000	47,435
Intangible assets, net	31,429	17,587
Deferred income taxes – long-term	43,242	35,789
Other assets	47,875	46,755
Total assets	\$867,788	\$ 1,061,233
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	\$6,661	\$ 5,009
Accrued payroll and other compensation	36,639	32,537
Accrued expenses and other	40,195	36,041
Deferred revenue	78,464	77,375
1.00% convertible senior notes, net	—	278,094
Total current liabilities	161,959	429,056
Noncurrent liabilities:		
Term loan, net	89,512	92,841
Deferred revenue, less current portion	2,901	5,256
Deferred tax liabilities	98	99
Other long-term liabilities	19,332	21,371
Total noncurrent liabilities	111,843	119,567
Total liabilities	273,802	548,623
Commitments and contingencies		
Stockholders' equity:		
Preferred stock, par value \$0.01 per share; 5,000 shares authorized, none issued and outstanding	—	—
Common stock, par value \$0.01 per share; 200,000 shares authorized; 65,888 and 62,801 shares issued; 61,194 and 58,607 shares outstanding, respectively	659	628
Additional paid-in capital	550,446	486,147
Treasury stock, 4,694 and 4,194 shares, respectively	(152,216)	(132,705)
Accumulated other comprehensive loss	(4,422)	(3,377)
Retained earnings	199,519	161,917
Total stockholders' equity	593,986	512,610

Total liabilities and stockholders' equity \$867,788 \$1,061,233

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

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MEDIDATA SOLUTIONS, INC.

CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS (Unaudited)

	Three Months Ended		Nine Months Ended		
	September 30,		September 30,		
	2018	2017	2018	2017	
	(Amounts in thousands, except per share data)				
Revenues					
Subscription	\$137,046	\$117,271	(4)\$394,351	\$338,068	(4)
Professional services	26,360	21,674	(4)74,158	64,548	(4)
Total revenues	163,406	138,945	468,509	402,616	
Cost of revenues (1)(2)					
Subscription	24,618	17,131	66,561	51,277	
Professional services	17,609	14,423	49,469	42,811	
Total cost of revenues	42,227	31,554	116,030	94,088	
Gross profit	121,179	107,391	352,479	308,528	
Operating costs and expenses					
Research and development (1)	40,626	36,207	118,937	102,028	
Sales and marketing (1)(2)	38,329	29,996	(4)112,296	92,701	(4)
General and administrative (1)	28,105	23,701	80,964	70,772	
Wire transaction recovery (3)	—	(4,770)	—	(4,770))
Total operating costs and expenses	107,060	85,134	312,197	260,731	
Operating income	14,119	22,257	40,282	47,797	
Interest and other income (expense)					
Interest expense	(3,147)	(4,407)	(14,422)	(13,117))
Interest income	2,128	1,531	6,544	4,030	
Other (expense) income, net	(389)	(7)	7,244	(7))
Total interest and other expense, net	(1,408)	(2,883)	(634)	(9,094))
Income before income taxes	12,711	19,374	39,648	38,703	
Provision for income taxes	2,023	6,331	(4)2,046	8,139	(4)
Net income	\$10,688	\$13,043	(4)\$37,602	\$30,564	(4)
Earnings per share					
Basic	\$0.18	\$0.23	(4)\$0.65	\$0.54	(4)
Diluted	\$0.17	\$0.22	(4)\$0.62	\$0.51	(4)
Weighted average common shares outstanding					
Basic	58,680	56,654	57,734	56,389	
Diluted	61,712	60,614	61,002	59,664	
(1) Stock-based compensation expense included in cost of revenues and operating costs and expenses is as follows:					
Cost of revenues	\$1,918	\$1,152	\$4,692	\$3,567	
Research and development	2,988	3,472	9,161	9,734	
Sales and marketing	3,732	1,864	9,293	4,875	
General and administrative	8,558	5,521	22,324	16,846	
Total stock-based compensation	\$17,196	\$12,009	\$45,470	\$35,022	
(2) Amortization of intangible assets included in cost of revenues and operating costs and expenses is as follows:					
Cost of revenues	\$1,371	\$1,094	\$3,670	\$2,570	
Sales and marketing	437	119	788	321	
Total amortization of intangible assets	\$1,808	\$1,213	\$4,458	\$2,891	

(3) Operating costs and expenses for the three and nine months ended September 30, 2017 include recognition of insurance recovery of amounts associated with the previously recognized 2014 wire transaction loss. For additional details, see Note 2, "Wire Transaction Recovery."

(4) The condensed consolidated statements of operations for the three and nine months ended September 30, 2017 have been recast to reflect the Company's January 1, 2018 full retrospective adoption of ASC 606. For additional details, see Note 1, "Summary of Significant Accounting Policies — Recently Adopted Accounting Pronouncements."

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

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MEDIDATA SOLUTIONS, INC.

CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (Unaudited)

	Three Months		Nine Months	
	Ended		Ended	
	September 30,		September 30,	
	2018	2017	2018	2017
	(Amounts in thousands)			
Net income	\$10,688	\$13,043	(1)\$37,602	\$30,564 (1)
Other comprehensive income (loss)				
Foreign currency translation adjustments	(515) 689	(1,199) 1,991
Unrealized gain on marketable securities	771	133	464	373
Other comprehensive income (loss)	256	822	(735) 2,364
Income tax related to unrealized gain on marketable securities	(188) (51) (310) (143
Other comprehensive income (loss), net of tax	68	771	(1,045) 2,221
Comprehensive income, net of tax	\$10,756	\$13,814	(1)\$36,557	\$32,785 (1)

(1) The condensed consolidated statements of comprehensive income for the three and nine months ended September 30, 2017 have been recast to reflect the Company's January 1, 2018 full retrospective adoption of ASC 606. For additional details, see Note 1, "Summary of Significant Accounting Policies — Recently Adopted Accounting Pronouncements."

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

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MEDIDATA SOLUTIONS, INC.

CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS (Unaudited)

	Nine Months Ended September 30,	
	2018	2017
	(Amounts in thousands)	
Cash flows from operating activities		
Net income	\$37,602	\$30,564
Adjustments to reconcile net income to net cash provided by operating activities		(1)
Amortization of intangible assets and depreciation	25,336	16,918
Stock-based compensation	45,470	35,022
Amortization of discounts or premiums on marketable securities	79	1,131
Realized loss on available-for-sale marketable securities	375	—
Deferred income taxes	(495)	6,035
Amortization of debt issuance costs	1,071	958
Amortization of debt discount	8,661	9,986
Provision for doubtful accounts	1,169	806
Loss (gain) on fixed asset disposal	399	(8)
Gain recognized on step acquisition	(7,648)	—
Changes in fair value of contingent consideration	(263)	160
Changes in operating assets and liabilities:		
Accounts receivable	(53,664)	9,050
Prepaid commission expense	(11,208)	(8,157)
Prepaid expenses and other current assets	6,113	(16,187)
Other assets	774	596
Accounts payable	3,510	(3,796)
Accrued payroll and other compensation	1,191	(3,155)
Accrued expenses and other	6,394	3,539
Deferred revenue	(4,275)	7,111
Other long-term liabilities	(3,344)	1,001
Net cash provided by operating activities	57,247	91,574
Cash flows from investing activities		
Purchases of furniture, fixtures and equipment	(28,929)	(30,502)
Purchases of available-for-sale securities	(69,214)	(224,291)
Proceeds from sale of available-for-sale securities	360,272	220,059
Acquisition of businesses, net of cash acquired	(179,063)	(22,941)
Net cash provided by (used in) investing activities	83,066	(57,675)
Cash flows from financing activities		
Proceeds from exercise of stock options	12,169	9,675
Proceeds from employee stock purchase plan	9,507	6,799
Acquisition of treasury stock	(19,509)	(16,293)
Term loan principal payments	(3,750)	—
Payment of acquisition-related earn-outs	(4,417)	—
Payment of credit facility financing costs	(175)	—
Repayment of convertible notes	(287,500)	—
Net cash (used in) provided by financing activities	(293,675)	181
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(453)	591
Net (decrease) increase in cash, cash equivalents and restricted cash	(153,815)	34,671
Cash, cash equivalents and restricted cash – Beginning of period	242,843	99,279

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Cash, cash equivalents and restricted cash – End of period \$89,028 \$133,950

(1) The condensed consolidated statement of cash flows for the nine months ended September 30, 2017 has been recast to reflect the Company's January 1, 2018 full retrospective adoption of ASC 606. For additional details, see Note 1, "Summary of Significant Accounting Policies — Recently Adopted Accounting Pronouncements."

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

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MEDIDATA SOLUTIONS, INC.

CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS, CONTINUED (Unaudited)

	Nine Months Ended September 30, 2018 2017	
Supplemental disclosures of cash flow information:		
Cash paid during the period for:		
Interest	\$5,952	\$2,879
Income taxes	\$3,431	\$3,891
Noncash investing activities:		
Furniture, fixtures, and equipment acquired but not yet paid for at period-end	\$5,053	\$6,463
Contingent consideration associated with acquisition of business, at fair value	\$—	\$5,697

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

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MEDIDATA SOLUTIONS, INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (Unaudited)

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Medidata Solutions, Inc., together with its consolidated subsidiaries (collectively, the "Company"), is the leading global provider of cloud-based solutions for clinical research in life sciences, offering platform technology that transforms clinical development and increases the value of its customers' research investments. The Company was organized as a New York corporation in June 1999 and reincorporated as a Delaware corporation in May 2000. Except to the extent updated or described below, the Company's significant accounting policies as of September 30, 2018 are the same as those at December 31, 2017, which are included in the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2017, filed with the Securities and Exchange Commission ("SEC") on February 28, 2018.

Basis of Presentation — The accompanying interim condensed consolidated balance sheets as of September 30, 2018 and December 31, 2017, the condensed consolidated statements of operations for the three and nine months ended September 30, 2018 and 2017, the condensed consolidated statements of comprehensive income for the three and nine months ended September 30, 2018 and 2017, and the condensed consolidated statements of cash flows for the nine months ended September 30, 2018 and 2017 are unaudited and have been prepared in accordance with accounting principles generally accepted in the United States of America ("U.S. GAAP") and applicable rules and regulations of the SEC for interim financial reporting. Accordingly, certain information and footnote disclosures have been condensed or omitted pursuant to SEC rules that would ordinarily be required by U.S. GAAP for complete financial statements. These unaudited interim condensed consolidated financial statements should be read in conjunction with the audited consolidated financial statements and accompanying notes thereto for the fiscal year ended December 31, 2017 included in the Company's Annual Report on Form 10-K filed with the SEC on February 28, 2018.

The unaudited interim condensed consolidated financial statements have been prepared on the same basis as the audited consolidated financial statements and, in the opinion of management, reflect all adjustments consisting of normal recurring accruals considered necessary to present fairly the Company's financial position as of September 30, 2018, results of its operations for the three and nine months ended September 30, 2018 and 2017, comprehensive income for the three and nine months ended September 30, 2018 and 2017, and cash flows for the nine months ended September 30, 2018 and 2017. The results of operations for the three and nine months ended September 30, 2018 are not necessarily indicative of the results that may be expected for the year ending December 31, 2018.

Accounts Receivable — Accounts receivable are recorded at original invoice amount less an allowance that management believes will be adequate to absorb estimated losses on uncollectible accounts. This allowance is based on an evaluation of the collectability of accounts receivable and prior bad debt experience. Accounts receivable are written off when deemed uncollectible. Unbilled receivables consist of revenue recognized in excess of billings, substantially all of which is expected to be billed and collected within one year. As of September 30, 2018 and December 31, 2017, unbilled accounts receivable of \$31.1 million and \$12.5 million, respectively, were included in accounts receivable on the Company's condensed consolidated balance sheets.

Revenue Recognition — Revenues are recognized when control of the promised goods or services are transferred to a customer, in an amount that reflects the consideration that the Company expects to receive in exchange for those goods or services. The Company derives its revenues from two sources: (1) subscription revenues, which are comprised of subscription fees from customers utilizing the Company's cloud-based solutions; and (2) professional services, such as training, implementation, consulting, interface creation, trial configuration, data testing, reporting, procedure documentation, and other customer-specific services. The Company applies the following five steps in order to determine the appropriate amount of revenue to be recognized as it fulfills its obligations under each of its agreements:

- identify the contract with a customer;
- identify the performance obligations in the contract;
- determine the transaction price;

- allocate the transaction price to performance obligations in the contract; and
- recognize revenue as the performance obligation is satisfied.

For further information, see Note 3, “Revenues,” to the condensed consolidated financial statements included in this Quarterly Report on Form 10-Q.

Subscription

The Company derives its subscription revenues from multi-study and single-study arrangements that grant the customer the right to utilize its cloud-based solutions for a specified term. Multi-study arrangements grant the customer the right to manage a predetermined number of clinical trials simultaneously for a term typically ranging from one to five years. Single-study arrangements allow customers to use the Company’s solutions on a per-trial basis. Subscription services are transferred to customers over time. The Company uses the passage of time as its measurement method, as control of the services is simultaneously transferred to and used by the customer throughout the contractual term. As a

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MEDIDATA SOLUTIONS, INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (Unaudited)

result, revenue for subscription services is recognized ratably over the term of the agreement, which is generally aligned with the dates during which the customer has access to the Company's cloud-based applications.

Fees for subscription services are generally invoiced in advance installments and typically have payment terms of net 30 or net 45 days.

Professional Services

The Company also makes available a range of professional services, including implementation, enablement, training, and strategic consulting. Professional services do not result in significant alterations to the underlying solutions.

Professional services engagements involving implementation and training tend to be shorter term in nature (expected durations of less than one year), while enablement and consulting type engagements are longer in term (expected durations of one to five years).

Professional services are transferred to customers over time. For fixed price arrangements, the Company measures its progress in transferring services to a customer using a proportional performance method. The proportional performance method is reflective of the variable rates at which services are transferred to the customer, and results in recognition of revenue that is consistent with the services provided to date. For time and materials contracts, the Company recognizes revenue as services are rendered.

Fees for professional services are generally invoiced either in milestone installments based on work performed or, for time and materials based arrangements, as services are rendered, and typically have payment terms of net 30 or net 45 days.

Performance Obligations

The Company enters into contracts that contain multiple distinct performance obligations, combining a cloud-based technology subscription with various professional services.

The Company has determined that its subscriptions and professional services are distinct performance obligations because both can be and are sold by the Company on a standalone basis, and because other vendors sell similar technologies and services on a standalone basis.

For each performance obligation identified, the Company estimates the standalone selling price, which represents the price at which the Company would sell the good or service separately. If the standalone selling price is not observable through past transactions, the Company estimates the standalone selling price, taking into account available information such as market conditions, review of historical pricing data, and internal pricing guidelines related to the performance obligations. The Company then allocates the transaction price among those obligations based on the estimation of standalone selling price. Transaction prices for the Company's contracts may include both fixed and variable consideration, but do not contain significant financing components or noncash consideration.

Cost to Obtain and Fulfill a Contract

The Company capitalizes commission expenses paid to internal sales personnel that are incremental to obtaining and renewing customer contracts. Costs related to nonrenewable contracts are deferred and amortized on a straight-line basis over the duration of the contractual term. Costs related to initial signing and renewals of renewable contracts are deferred and amortized on a straight-line basis over a period equal to twice the term of the contract or renewal, which the Company deems to be the expected period of benefit for these costs. In developing this estimate, the Company considered its historical renewal rates and customer and revenue retention rates, as well as technology development life cycles and other industry factors. The Company defers these costs in prepaid commission expense, net of any long term portion included in other noncurrent assets in the Company's condensed consolidated balance sheets. These costs are periodically reviewed for impairment.

Income Taxes — The Company's interim period provision for income taxes is computed by using an estimate of the annual effective tax rate, adjusted for discrete items taken into account in the relevant period, if any. Each quarter, the annual effective income tax rate is recomputed and if there are material changes in the estimate, a cumulative adjustment is made.

Recently Adopted Accounting Pronouncements — In May 2014, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2014-09, Revenue from Contracts with Customers, which supersedes the existing accounting standards for revenue recognition in Accounting Standards Codification ("ASC") 605, and provides principles for recognizing revenue for the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods and services. ASU No. 2014-09 also creates a new subtopic under ASC 340, Other Assets and Deferred Costs, which discusses the deferral of incremental costs of obtaining a contract with a customer, including the period of amortization of such costs. The Company adopted ASU No. 2014-09 on January 1, 2018, using the full retrospective method. Refer to Note 3, "Revenues," for related disclosures.

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MEDIDATA SOLUTIONS, INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (Unaudited)

The following tables summarize the impact of adoption of ASC 606 on the Company's condensed consolidated statements of operations for the three and nine months ended September 30, 2017 (in thousands, except per share data):

	Three Months Ended September 30, 2017			Nine Months Ended September 30, 2017		
	As Reported Under ASC 605	Impact of ASC 606 Adoption	As Adjusted	As Reported Under ASC 605	Impact of ASC 606 Adoption	As Adjusted
Revenues						
Subscription	\$ 118,411	\$(1,140)	\$ 117,271	\$ 339,772	\$(1,704)	\$ 338,068
Professional services	21,669	5	21,674	64,543	5	64,548
Total revenues	140,080	(1,135)	138,945	404,315	(1,699)	402,616
Operating costs and expenses						
Sales and marketing	31,428	(1,432)	29,996	94,321	(1,620)	92,701
Operating income	21,960	297	22,257	47,876	(79)	47,797
Provision for income taxes	6,233	98	6,331	8,170	(31)	8,139
Net income	\$ 12,844	\$ 199	\$ 13,043	\$ 30,612	\$(48)	\$ 30,564
Earnings per share						
Basic	\$0.23	\$—	\$0.23	\$0.54	\$—	\$0.54
Diluted	\$0.21	\$0.01	\$0.22	\$0.51	\$—	\$0.51

The adoption has no cash flow impact.

In January 2016, the FASB issued ASU No. 2016-01, Recognition and Measurement of Financial Assets and Financial Liabilities, which amends certain aspects of recognition, measurement, presentation, and disclosure of financial instruments. ASU No. 2016-01 is effective for annual reporting periods beginning after December 15, 2017, including interim periods within those annual periods. The Company adopted ASU No. 2016-01 on January 1, 2018, and the adoption did not have a material impact on its condensed consolidated financial statements.

In August 2016, the FASB issued ASU No. 2016-15, Cash Flows - Classification of Certain Cash Receipts and Cash Payments, which addresses the diversity in practice around presentation of certain cash receipts and payments in the statement of cash flows. ASU No. 2016-15 is effective for annual periods beginning after December 15, 2017, and interim periods within those annual periods. The Company adopted ASU No. 2016-15 on January 1, 2018, and the adoption did not have a material impact on its condensed consolidated financial statements.

In January 2017, the FASB issued ASU No. 2017-01, Clarifying the Definition of a Business, which provides a more specific definition of a business than was afforded under previous guidance. The definition of a business affects many areas of accounting, including acquisitions, disposals, goodwill, and consolidation. ASU No. 2017-01 is effective for annual periods beginning after December 15, 2017, including interim periods within those annual periods. The Company adopted ASU No. 2017-01 on January 1, 2018, and the adoption had no impact on its condensed consolidated financial statements.

In May 2017, the FASB issued ASU No. 2017-09, Scope of Modification Accounting, which clarifies when a change in the terms or conditions of a share-based payment award should be accounted for as a modification. ASU No.

2017-09 is effective for annual periods beginning after December 15, 2017, including interim periods within those annual periods. The Company adopted ASU No. 2017-09 on January 1, 2018, and the adoption did not have a material impact on its condensed consolidated financial statements.

In June 2018, the FASB issued ASU No. 2018-07, Improvements to Nonemployee Share-Based Payment Accounting, which simplifies several aspects of the accounting for nonemployee share-based payment transactions by expanding the scope of the stock-based compensation guidance in ASC 718 to include share-based payment transactions for acquiring goods and services from non-employees. ASU No. 2018-07 is effective for annual periods beginning after December 15, 2018, including interim periods within those annual periods. Early adoption is permitted, but entities may not adopt prior to adopting the new revenue recognition guidance in ASC 606. The Company early adopted ASU No. 2018-07 in the second quarter of 2018, and the adoption did not have a material impact on its consolidated financial statements.

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MEDIDATA SOLUTIONS, INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (Unaudited)

Recently Issued Accounting Pronouncements — There have been no changes in the expected dates of adoption or estimated effects on the Company's consolidated financial statements of recently issued accounting pronouncements from those disclosed in the Company's Annual Report on Form 10-K, except as described below.

In February 2016, the FASB issued ASU No. 2016-02, Leases, which replaces previous lease guidance in its entirety with ASC 842 and requires lessees to recognize lease assets and lease liabilities for those arrangements classified as operating leases under previous guidance, with the exception of leases with a term of twelve months or less. ASU No. 2016-02 is effective for annual periods beginning after December 15, 2018, including interim periods within those annual periods. Originally, entities were required to adopt ASU No. 2016-02 using a modified retrospective method; however, in July 2018, the FASB issued ASU No. 2018-11, Leases (Topic 842): Targeted Improvements, which provides entities with an additional choice of transition method. Under ASU No. 2018-11, entities have the option of recognizing the cumulative effect of applying the new standard as an adjustment to beginning retained earnings in the year of adoption while continuing to present all prior periods under previous lease accounting guidance. The Company will adopt the new leasing standard on January 1, 2019, using the additional transition method. The Company estimates that the hypothetical balance sheet impact of recognizing lease assets and lease liabilities on its condensed consolidated balance sheets for its facility operating leases would be approximately 10% of total assets and 25% of total liabilities as of September 30, 2018, based on the present value of the remaining minimum rental payments under current leasing standards for existing operating leases. The final quantitative impact of the adoption of the new lease guidance is subject to change from these estimates, pending the completion of the Company's implementation in the first quarter of 2019.

In February 2018, the FASB issued ASU No. 2018-02, Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income, which permits companies to reclassify disproportionate tax effects in accumulated other comprehensive income caused by the U.S. Tax Cuts and Jobs Act enacted in December 2017 to retained earnings. ASU No. 2018-02 is effective for annual reporting periods beginning after December 15, 2018, and interim periods within those annual periods. The Company will adopt ASU No. 2018-02 on January 1, 2019, and does not expect the adoption to have a material impact on its condensed consolidated financial statements.

In August 2018, the FASB issued ASU No. 2018-13, Changes to the Disclosure Requirements for Fair Value Measurement, which modifies certain disclosure requirements of ASC 820, some prospectively and some retrospectively. ASU No. 2018-13 is effective for annual reporting periods beginning after December 15, 2019, and interim periods within those annual periods. The Company will adopt ASU No. 2018-13 on January 1, 2020, and the adoption is not expected to have a material impact on its fair value disclosures.

In August 2018, the FASB issued ASU No. 2018-15, Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract, which aligns the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing costs incurred to develop or obtain internal-use software. ASU No. 2018-15 is effective for annual reporting periods beginning after December 15, 2019, including interim periods within those annual periods, with early adoption permitted. The new guidance is required to be applied either retrospectively or prospectively to all implementation costs after the date of adoption. The Company will adopt ASU No. 2018-15 no later than January 1, 2020, and does not expect the adoption to have a material impact on its condensed consolidated financial statements.

2. WIRE TRANSACTION RECOVERY

In September 2014, the Company was the victim of a crime involving the transfer of \$4.8 million to an overseas account. As a result, the Company recorded charges of \$4.9 million and \$0.9 million to its operating costs and expenses in the third and fourth quarters of 2014, respectively, for the loss and related investigation costs incurred. The Company filed an insurance claim for its loss, and its insurer, Federal Insurance Co. ("Federal"), denied coverage. The Company commenced legal action, alleging that Federal had wrongly denied coverage. On July 21, 2017, the United States District Court for the Southern District of New York granted the Company's motion for summary judgment, and denied Federal's motion. In light of this ruling, the Company recognized the probable recovery of the

originally recorded \$4.8 million loss as a credit to its operating costs and expenses for the three and nine months ended September 30, 2017. Federal filed a Notice of Appeal with the United States Court of Appeals for the Second Circuit ("the Court") on August 11, 2017. On July 6, 2018, the Court affirmed the Company's judgment against Federal, awarding the Company a total of \$5.9 million, which includes interest. The Company received the full amount of the judgment in September 2018 and recognized the \$1.1 million in interest income in its condensed consolidated statements of operations for the three and nine months ended September 30, 2018.

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MEDIDATA SOLUTIONS, INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (Unaudited)

3. REVENUES

Disaggregation of Revenue

The following tables provide information about the Company's revenues, disaggregated by geographical market and revenue type, for the three and nine months ended September 30, 2018 and 2017 (in thousands):

	Three Months Ended September 30,			2017		
	2018					
	Subscription	Professional Services	Total	Subscription	Professional Services	Total
Revenues:						
United States	\$ 103,152	\$ 17,519	\$ 120,671	\$ 89,426	\$ 15,718	\$ 105,144
Rest of Americas	1,779	452	2,231	147	270	417
Total Americas	104,931	17,971	122,902	89,573	15,988	105,561
Japan	7,784	1,961	9,745	7,975	1,395	9,370
Rest of Asia Pacific	4,707	1,779	6,486	2,954	825	3,779
Total Asia Pacific	12,491	3,740	16,231	10,929	2,220	13,149
Europe, Middle East and Africa	19,624	4,649	24,273	16,769	3,466	20,235
Total	\$ 137,046	\$ 26,360	\$ 163,406	\$ 117,271	\$ 21,674	\$ 138,945
	Nine Months Ended September 30,			2017		
	2018					
	Subscription	Professional Services	Total	Subscription	Professional Services	Total
Revenues:						
United States	\$ 298,963	\$ 52,029	\$ 350,992	\$ 259,190	\$ 46,334	\$ 305,524
Rest of Americas	3,777	933	4,710	234	491	725
Total Americas	302,740	52,962	355,702	259,424	46,825	306,249
Japan	23,561	5,016	28,577	22,251	4,424	26,675
Rest of Asia Pacific	12,283	4,160	16,443	7,906	3,122	11,028
Total Asia Pacific	35,844	9,176	45,020	30,157	7,546	37,703
Europe, Middle East and Africa	55,767	12,020	67,787	48,487	10,177	58,664
Total	\$ 394,351	\$ 74,158	\$ 468,509	\$ 338,068	\$ 64,548	\$ 402,616

The above tables present revenues according to the region in which they were generated, separately displaying those individual countries that, in any of the periods presented, constituted 5% or more of total revenues. All of the Company's performance obligations are transferred to customers over time; as a result, no disaggregation of revenues by timing of revenue recognition is provided.

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Contract Balances

The following table provides information about changes in the Company's deferred revenue balances during the nine months ended September 30, 2018 and 2017 (in thousands):

	Deferred Revenue	
	2018	2017
Balance as of January 1	\$82,631	\$75,850
Revenue recognized that was included in deferred revenue at the beginning of the period	(74,067)	(67,762)
Revenue recognized that was not included in deferred revenue at the beginning of the period	(393,719)	(333,891)
Increases due to invoicing	446,477	410,083
Revenue recognized in excess of billings	18,632	255
Other	1,412	(1,349)
Balance as of September 30	\$81,365	\$83,186

Aside from the accounts receivable presented on its condensed consolidated balance sheets, the Company did not have any material contract assets for any of the periods presented.

Transaction Price Allocated to the Remaining Performance Obligations

As of September 30, 2018, the Company has unsatisfied performance obligations associated with subscription services that extend through 2030. The total multi-year transaction price allocated to unsatisfied subscription performance obligations is approximately \$979 million as of September 30, 2018. Of this amount, approximately \$136 million, \$413 million, and \$430 million are expected to be recognized in 2018, 2019, and thereafter, respectively.

As of September 30, 2018, the total transaction price allocated to unsatisfied professional services performance obligations is immaterial.

Costs to Obtain and Fulfill a Contract with a Customer

Sales commissions earned are considered incremental and recoverable costs of obtaining a contract with a customer and therefore are capitalized as contract costs. Capitalized contract costs were \$48.1 million and \$36.9 million as of September 30, 2018 and December 31, 2017, respectively. Amortization of capitalized contract costs was \$5.5 million and \$6.0 million for the three months ended September 30, 2018 and 2017, respectively, and \$14.9 million and \$18.1 million for the nine months ended September 30, 2018 and 2017, respectively. There have been no impairment losses related to capitalized contract costs.

4. STOCKHOLDERS' EQUITY

Common Stock — Common stockholders are entitled to one vote for each share of common stock held. Common stockholders may receive dividends if and when the board of directors determines, at its sole discretion.

Treasury Stock — From time to time, the Company grants nonvested restricted stock awards ("RSAs"), restricted stock units ("RSUs"), and performance-based restricted stock units ("PBRsUs") to its employees pursuant to the terms of its Amended and Restated 2017 Long-Term Incentive Plan ("2017 Plan") and formerly pursuant to the terms of its Second Amended and Restated 2009 Long-Term Incentive Plan ("2009 Plan"). Under the provisions of the 2017 Plan and 2009 Plan, unless otherwise elected, participants fulfill their related income tax obligation by having shares withheld at the time of vesting. On the date of vesting, the Company divides the participant's income tax withholding obligation in dollars by the closing price of its common stock and withholds the resulting number of vested shares. The shares withheld are then transferred to the Company's treasury stock at cost.

During the nine months ended September 30, 2018 and 2017, the Company withheld 286,884 shares at an average price of \$68.01 and 280,622 shares at an average price of \$58.06, respectively, in connection with the vesting of equity awards.

Nonvested restricted stock awards forfeited by plan participants are transferred to the Company's treasury stock at par. During the nine months ended September 30, 2018 and 2017, 213,752 and 193,489 forfeited shares, respectively, were transferred to treasury stock at their par value of \$0.01.

5. INVESTMENTS

Marketable Securities

Marketable securities, which the Company classifies as available-for-sale securities, primarily consist of high quality commercial paper, corporate bonds, and U.S. government debt obligations. Marketable securities with remaining effective maturities of twelve months or less from the balance sheet date are classified as short-term; otherwise, they are classified as long-term on the condensed consolidated balance sheets.

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MEDIDATA SOLUTIONS, INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (Unaudited)

The following tables provide the Company's marketable securities by security type as of September 30, 2018 and December 31, 2017 (in thousands):

	As of September 30, 2018				
	Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value	
	Commercial paper and corporate bonds	\$125,295	\$ —	—\$ (910)	\$124,385
	U.S. government agency debt securities	10,690	—	(114)	10,576
Total	\$135,985	\$ —	—\$ (1,024)	\$134,961	

	As of December 31, 2017				
	Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value	
	Commercial paper and corporate bonds	\$392,481	\$ —	—\$ (1,334)	\$391,147
	U.S. government agency debt securities	35,016	—	(155)	34,861
Total	\$427,497	\$ —	—\$ (1,489)	\$426,008	

Contractual maturities of the Company's marketable securities as of September 30, 2018 and December 31, 2017 are summarized as follows (in thousands):

	As of September 30, 2018		As of December 31, 2017	
	Cost	Estimated Fair Value	Cost	Estimated Fair Value
	Due in one year or less	\$115,895	\$115,083	\$247,495
Due in one to five years	20,090	19,878	180,002	179,041
Total	\$135,985	\$134,961	\$427,497	\$426,008

At September 30, 2018, the Company had \$1.0 million of gross unrealized losses primarily due to a decrease in the fair value of certain corporate bonds.

The Company regularly reviews its investment portfolio to identify and evaluate investments that have indications of possible impairment. Investments that are impaired are those that are considered to have losses that are other-than-temporary. Factors considered in determining whether a loss is temporary include:

- the length of time and extent to which fair value has been lower than the cost basis;
- the financial condition, credit quality and near-term prospects of the investee; and
- whether it is more likely than not that the Company will be required to sell the security prior to recovery.

As the Company has the ability and intent to hold these investments until a recovery of fair value, which may be maturity, the Company has determined that the gross unrealized losses on such investments at September 30, 2018 are temporary in nature. Accordingly, the Company did not consider its investments in marketable securities to be other-than-temporarily impaired as of September 30, 2018.

The following tables provide the fair market value and gross unrealized losses of the Company's marketable securities with unrealized losses, aggregated by security type, as of September 30, 2018 and December 31, 2017 (in thousands):

	In Loss Position for Less than 12 Months			
	As of September 30, 2018		As of December 31, 2017	
	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
	Commercial paper and corporate bonds	\$45,178	\$ (408)	\$295,224

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U.S. government agency debt securities	6,118	(72)	18,431	(86)
Total	\$51,296	\$ (480)	\$313,655	\$ (1,223)

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	In Loss Position for More than 12 Months			
	As of September 30, 2018		As of December 31, 2017	
	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
Commercial paper and corporate bonds	\$79,207	\$ (502)	\$95,923	\$ (197)
U.S. government agency debt securities	4,458	(42)	16,430	(69)
Total	\$83,665	\$ (544)	\$112,353	\$ (266)

During the three and nine months ended September 30, 2018, the Company recorded \$0.4 million of net realized losses from the sale of marketable securities, as a result of significant sales in the period to generate cash to settle its 1.00% convertible senior notes. During the three and nine months ended September 30, 2017, the Company recorded an insignificant amount of net realized gains from the sale of marketable securities.

Other Investments

The Company holds shares of Series D Preferred Stock of Syapse Inc. ("Syapse") purchased in a private placement. This investment does not have a readily determinable fair value and is carried at original cost in other assets on the Company's condensed consolidated balance sheets. This investment had a carrying value of \$3.0 million as of September 30, 2018 and December 31, 2017. The Company periodically evaluates this investment to determine if impairment charges are required; no impairment charges were recognized during the three and nine months ended September 30, 2018.

As of December 31, 2017, the Company held shares of Series Seed Preferred Stock and Series B Preferred Stock of SHYFT Analytics, Inc. ("SHYFT"), purchased in private placements. These investments did not have a readily determinable fair value and were carried at original cost of \$5.1 million in other assets on the Company's condensed consolidated balance sheets. In June 2018, the Company acquired SHYFT and realized a gain on step acquisition of \$7.6 million based upon the implied fair value of its previous holdings relative to the enterprise value for the transaction. This gain is included in other income, net on the Company's condensed consolidated statement of operations for the nine months ended September 30, 2018. Refer to Note 7, "Acquisitions," for further discussion of the Company's acquisition of SHYFT.

6. FAIR VALUE

The following table summarizes, as of September 30, 2018 and December 31, 2017, the Company's financial assets and liabilities that are measured at fair value on a recurring basis, according to the fair value hierarchy described in the significant accounting policies included in the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2017 (in thousands):

	As of September 30, 2018				As of December 31, 2017			
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
Cash	\$82,591	\$—	\$—	\$82,591	\$237,149	\$—	\$—	\$237,149
Money market funds	905	—	—	905	176	—	—	176
Total cash and cash equivalents	83,496	—	—	83,496	237,325	—	—	237,325
Commercial paper and corporate bonds	—	124,385	—	124,385	—	391,147	—	391,147
U.S. government agency debt securities	—	10,576	—	10,576	—	34,861	—	34,861
Total marketable securities	—	134,961	—	134,961	—	426,008	—	426,008
Total financial assets measured at fair value on a recurring basis	\$83,496	\$134,961	\$—	\$218,457	\$237,325	\$426,008	\$—	\$663,333
Contingent consideration – short-term	\$—	\$—	\$1,332	\$1,332	\$—	\$—	\$3,993	\$3,993
Contingent consideration – long-term	—	—	—	—	—	—	2,012	2,012

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Total financial liabilities measured at fair value on a recurring basis	\$—	\$—	\$1,332	\$1,332	\$—	\$—	\$6,005	\$6,005
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Investments in commercial paper, corporate bonds, and U.S. government agency debt securities have been classified as Level 2 as they are valued using quoted prices in less active markets or other directly or indirectly observable inputs. Fair values of corporate bonds and U.S. government agency debt securities were derived from a consensus or weighted-average price based on input of market prices from multiple sources at each reporting period. With regard to commercial paper, all of the securities had high credit ratings and one year or less to maturity; therefore, fair value was derived from accretion of purchase price to face value over the term of maturity or quoted market prices for similar instruments if available. During the nine months ended September 30, 2018 and 2017, there were no transfers of financial assets between Level 1 and Level 2.

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MEDIDATA SOLUTIONS, INC.

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Contingent consideration liabilities associated with earn-out payments related to the Company's February 2017 acquisition of CHITA Inc. ("CHITA") are classified as Level 3 in the fair value hierarchy because they rely significantly on inputs that are unobservable in the market. The fair value of portions of contingent consideration related to the achievement of a technical milestone have been estimated using situation-based modeling, which considers the probability-weighted present value of the expected payout amount. The fair value of portions of contingent consideration related to achievement of revenue targets have been estimated using a Monte Carlo simulation to simulate future performance of the acquired business under a risk-neutral framework; significant inputs to the simulation include a risk-adjusted discount rate of 10.2% and revenue volatility of 8.0%. Short-term and long-term portions of contingent consideration are recorded in accrued expenses and other and other long-term liabilities, respectively, on the Company's condensed consolidated balance sheets.

The following table provides a summary of changes in fair value of the Company's Level 3 financial liabilities during the nine months ended September 30, 2018 (in thousands):

Balance as of January 1, 2018	\$6,005
Amounts earned by sellers	(4,410)
Fair value adjustment (included in general and administrative expenses)	(263)
Balance as of September 30, 2018	\$1,332

The carrying amounts of all other current financial assets and current financial liabilities reflected in the condensed consolidated balance sheets approximate fair value due to their short-term nature.

7. ACQUISITIONS

Nine Months Ended September 30, 2018

On June 20, 2018, the Company acquired all outstanding equity interests in SHYFT, a Waltham, Massachusetts provider of cloud data analytics for life sciences. With this acquisition, the Company expands its offerings to include commercial and real-world data analytics solutions that are designed specifically for the pharmaceutical and biotech industries.

The total purchase price of \$196.5 million was composed of cash consideration of \$183.8 million and the Company's previous investment in SHYFT, which had a fair value of \$12.7 million as of the acquisition date. (Refer to Note 5, "Investments — Other Investments" for further information on the initial investment and gain recognized on step acquisition.)

In connection with this acquisition, the Company acquired \$4.7 million in cash and cash equivalents and assumed \$1.9 million in net tangible liabilities. As of June 30, 2018, the allocation of the remaining purchase price was incomplete, and the Company recorded a provisional purchase price allocation based on observation of industry trends. During the three months ended September 30, 2018, valuation and useful life determination for the acquired intangible assets were completed, resulting in a final purchase price allocation consisting of \$18.3 million in intangible assets, a deferred tax asset of \$7.3 million, and \$168.1 million of goodwill as of September 30, 2018. This transaction generates significant goodwill due to the sizable skilled workforce acquired and the considerable buyer-specific synergies expected.

Intangible assets acquired were as follows (in millions):

	Acquisition Date Fair Value	Weighted-Average Useful Life
Developed technology	\$ 7.0	5 years
Customer relationships	4.7	6 years
Trade name	5.4	15 years
Non-competition agreements	1.2	3 years
Total	\$ 18.3	

The Company's consolidated results of operations for the three and nine months ended September 30, 2018 include the revenues and expenses of SHYFT since the date of acquisition. The Company does not consider this acquisition to be

significant to its results of operations; as such, pro forma revenue and earnings information has not been provided.
Nine Months Ended September 30, 2017

The Company acquired all outstanding equity interests in CHITA and Mytrus, Incorporated ("Mytrus") on February 17, 2017 and April 18, 2017, respectively, adding regulated document and standard operating procedure ("SOP") management, electronic trial master file ("eTMF"), and eConsent capabilities to its platform. Aggregate purchase consideration of \$28.9 million consisted of upfront consideration of \$23.2 million and contingent consideration (associated with CHITA) initially valued at \$5.7 million.

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MEDIDATA SOLUTIONS, INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (Unaudited)

8. GOODWILL AND INTANGIBLE ASSETS

The change in the carrying amount of goodwill during the nine months ended September 30, 2018 was as follows (in thousands):

Balance as of January 1, 2018	\$47,435
Additions related to acquisition - SHYFT	168,132
Final purchase price adjustment - Mytrus	(422)
Foreign currency translation adjustments	(145)
Balance as of September 30, 2018	\$215,000

Total intangible assets are summarized as follows (in thousands):

	As of September 30, 2018			As of December 31, 2017		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Developed technology	\$31,388	\$ (12,505)	\$ 18,883	\$24,436	\$ (8,883)	\$ 15,553
Customer relationships	9,176	(3,112)	6,064	4,489	(2,595)	1,894
Trade name	5,400	(100)	5,300	—	—	—
Non-competition agreements	1,460	(278)	1,182	260	(120)	140
Total	\$47,424	\$ (15,995)	\$ 31,429	\$29,185	\$ (11,598)	\$ 17,587

Future amortization of intangible assets is expected to be as follows (in thousands):

Remainder of 2018	\$1,883
2019	7,473
2020	6,730
2021	6,249
2022	3,465
2023	1,849
Thereafter	3,780
Total	\$31,429

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MEDIDATA SOLUTIONS, INC.

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9. DEBT

1.00% Convertible Senior Notes

The Company's 1.00% convertible senior notes (the "Notes"), issued in August 2013 and settled on August 1, 2018, consisted of the following components as of September 30, 2018 and December 31, 2017 (in thousands):

	September 30, December 31,	
	2018	2017
Equity component, net of equity issue costs	\$	—\$ 60,222
Liability component:		
Principal	—	287,500
Less: unamortized debt discount	—	(8,661)
Less: unamortized debt issuance costs	—	(745)
Net carrying amount	\$	—\$ 278,094

The Notes matured on August 1, 2018, and the Company received notices of conversion for substantially all of the outstanding Notes prior to the maturity date. The Company settled the \$287.5 million principal amount of the Notes in cash and the conversion premium in shares of its common stock. The Company issued 1.4 million shares of common stock in settlement of the premium, determined by a calculation based on the volume-weighted average price of the Company's common stock over the 40 trading-day observation period beginning on and including June 1, 2018, as specified in the indenture governing the Notes.

The following table sets forth total interest expense recognized related to the Notes for the three and nine months ended September 30, 2018 and 2017 (in thousands except percentages):

	Three Months Ended		Nine Months Ended	
	September 30,		September 30,	
	2018	2017	2018	2017
Contractual interest expense	\$210	\$718	\$1,648	\$2,156
Amortization of debt issuance costs	106	319	745	958
Amortization of debt discount	1,646	3,379	8,661	9,986
Total	\$1,962	\$4,416	\$11,054	\$13,100

Effective interest rate 6.5 % 6.5 % 6.5 % 6.5 %

Credit Facility

The Company's credit facility agreement (the "Credit Facility"), entered into in December 2017, consists of revolving commitments with a maximum borrowing amount of \$400.0 million (the "Revolver"), currently undrawn, and term loans (the "Term Loans") in an aggregate principal amount of \$100.0 million. The repayment terms of the Term Loans provide for monthly interest payments and quarterly principal payments, with a maturity date of December 2022. The Credit Facility consisted of the following components as of September 30, 2018 and December 31, 2017 (in thousands):

	September 30, December 31,	
	2018	2017
Term Loans	\$ 96,250	\$ 100,000
Less: unamortized debt issuance costs	(1,833)	(2,159)
Net carrying amount (1)	\$ 94,417	\$ 97,841

(1) Of the total carrying amount of the Term Loans, short-term maturities of \$4.9 million and \$5.0 million were included in accrued expenses and other on the Company's condensed consolidated balance sheets as of September 30, 2018 and December 31, 2017, respectively.

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As of September 30, 2018, the contractual interest rate on the Term Loans was 3.605%, and there was a 0.200% commitment fee on the undrawn Revolver. The following table sets forth total interest expense recognized related to the Credit Facility for the three and nine months ended September 30, 2018 (in thousands):

	Three Months Ended September 30, 2018	Nine Months Ended September 30, 2018
Contractual interest expense on Term Loans	\$874	\$2,433
Amortization of debt issuance costs	109	326
Unused commitment fee on Revolver	200	609
Total	\$1,183	\$3,368

As of September 30, 2018 the remaining term of the Credit Facility is approximately 51 months. The Company was in compliance with all financial covenants related to the Credit Facility as of September 30, 2018.

10. STOCK-BASED COMPENSATION

For the three and nine months ended September 30, 2018 and 2017, the components of stock-based compensation expense were as follows (in thousands):

	Three Months Ended September 30, 2018		Nine Months Ended September 30, 2017	
Stock options	\$494	\$735	\$1,588	\$2,590
Restricted stock awards and units	11,621	7,786	28,512	22,474
Performance-based restricted stock units	4,017	2,414	11,176	7,116
Employee stock purchase plan	1,176	1,236	4,436	3,133
Total stock-based compensation (1)	\$17,308	\$12,171	\$45,712	\$35,313

(1) Total stock-based compensation is presented in this table on a gross basis, consistent with the additional paid-in capital impact recorded in stockholders' equity. On the Company's condensed consolidated statements of operations and condensed consolidated statements of cash flows, stock-based compensation is presented net of foreign exchange impact and capitalization of eligible software development-related costs.

Stock Options

The fair value of each stock option granted during the three and nine months ended September 30, 2018 and 2017 was estimated on the date of grant using a Black-Scholes pricing model with the following weighted-average assumptions:

	Three Months Ended September 30, 2018		Nine Months Ended September 30, 2017	
Expected volatility	— %	— %	42 %	44 %
Expected life	N/A	N/A	4.78 years	6.00 years
Risk-free interest rate	— %	— %	2.82 %	2.07 %
Dividend yield	—	—	—	—

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The following table summarizes the status of the Company's stock options as of September 30, 2018, and changes during the nine months then ended (in thousands, except per share data):

	Number of Shares	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (years)	Aggregate Intrinsic Value
Outstanding at January 1, 2018	1,511	\$22.72		
Granted	35	72.27		
Exercised	(369)	33.01		
Forfeited	(34)	45.55		
Expired	—	—		
Outstanding at September 30, 2018	1,143	\$20.24	3.40	\$60,784
Exercisable at September 30, 2018	990	\$14.27	2.64	\$58,437
Vested and expected to vest at September 30, 2018	1,133	\$19.86	3.36	\$60,664

No stock options were granted during the three months ended September 30, 2018 and 2017. The weighted-average grant-date fair value of stock options granted during the nine months ended September 30, 2018 and 2017 was \$28.93 and \$25.37, respectively. The total intrinsic value of stock options exercised during the three months ended September 30, 2018 and 2017 was \$4.2 million and \$0.7 million, respectively. The total intrinsic value of stock options exercised during the nine months ended September 30, 2018 and 2017 was \$15.6 million and \$8.7 million, respectively.

As of September 30, 2018, there was \$3.4 million in unrecognized compensation cost related to all non-vested stock options granted. This cost is expected to be recognized over a weighted-average remaining period of 2.33 years.

Restricted Stock Awards and Units

The following table summarizes the status of the Company's nonvested time-based RSAs and RSUs as of September 30, 2018, and changes during the nine months then ended (in thousands, except per share data):

	Number of Shares	Weighted-Average Grant-Date Fair Value
Nonvested at January 1, 2018	1,754	\$48.45
Granted	1,024	72.84
Vested	(597)	47.52
Forfeited	(215)	51.35
Nonvested at September 30, 2018	1,966	\$61.12

The total fair value of RSAs and RSUs vested during the three months ended September 30, 2018 and 2017 was \$3.5 million and \$9.0 million, respectively. The total fair value of RSAs and RSUs vested during the nine months ended September 30, 2018 and 2017 was \$40.8 million and \$40.0 million, respectively.

As of September 30, 2018, there was \$97.1 million in unrecognized compensation cost related to all nonvested RSAs and RSUs granted. This cost is expected to be recognized over a weighted-average remaining period of 2.47 years.

Performance-Based Restricted Stock Units

During the three months ended September 30, 2018, the Company granted 3 thousand PBRsUs with performance conditions based on achievement of certain individual and team objectives.

During the three months ended September 30, 2017, the Company granted 46 thousand PBRsUs with performance conditions based on achievement of certain individual and team objectives.

During the nine months ended September 30, 2018, the Company granted: (1) 122 thousand PBRsUs ("2018 TSR PBRsUs") with market conditions based on the Company's total stockholder return ("TSR") relative to that of the Russell 2000 Index over the three-year period ending December 31, 2020, vesting in full in three years with the number of shares ultimately earned ranging from zero to 200% of the target number of shares; (2) 122 thousand PBRsUs ("2018 Net Income PBRsUs") with performance conditions based on the compound annual growth rate of net income over the three-year period ending December 31, 2020, vesting in full in three years with the number of shares ultimately earned ranging from zero to 200% of the target number of shares; and (3) 5 thousand PBRsUs with performance conditions based on achievement of certain individual and team objectives.

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MEDIDATA SOLUTIONS, INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (Unaudited)

During the nine months ended September 30, 2017, the Company granted: (1) 132 thousand PBRsUs ("2017 TSR PBRsUs") with market conditions based on the Company's TSR relative to that of the Russell 2000 Index over the three-year period ending December 31, 2019, vesting in full in three years with the number of shares ultimately earned ranging from zero to 200% of the target number of shares; (2) 132 thousand PBRsUs ("2017 Net Income PBRsUs") with performance conditions based on the compound annual growth rate of net income over the three-year period ending December 31, 2019, vesting in full in three years with the number of shares ultimately earned ranging from zero to 200% of the target number of shares; and (3) 46 thousand PBRsUs with performance conditions based on achievement of certain individual and team objectives.

The fair value of PBRsUs with market conditions granted during the three and nine months ended September 30, 2018 and 2017 was estimated as of the date of grant using a Monte Carlo valuation model with the following weighted average assumptions:

	Three Months Ended September 30,		Nine Months Ended September 30,			
	2018	2017	2018	2017		
Expected volatility - Medidata	— %	— %	37 %	42 %		%
Expected volatility - comparison index	— %	— %	42 %	43 %		%
Expected life	N/A	N/A	2.85 years	2.85 years		
Risk-free interest rate	— %	— %	2.37 %	1.40 %		%
Dividend yield	—	—	—	—		

The following table summarizes the status of the Company's PBRsUs based upon expected performance as of September 30, 2018, and changes during the nine months then ended (in thousands, except per share data):

	Net Income	TSR	Other	Total Number of Shares	Weighted-Average Grant Date Fair Value
Nonvested at January 1, 2018	110	613	13	736	\$ 62.96
Granted (based on performance at 100% of targeted levels)	122	122	5	249	85.88
Adjustment related to expected performance	—	160	8	168	76.81
Vested	—	(120)	(1)	(121)	70.00
Forfeited	—	—	(1)	(1)	77.64
Nonvested at September 30, 2018	232	775	24	1,031	\$ 69.91

The total fair value of PBRsUs vested during the three months ended September 30, 2018 and 2017 was \$0.1 million and \$0.1 million, respectively. The total fair value of PBRsUs vested during the nine months ended September 30, 2018 and 2017 was \$8.2 million and \$5.2 million, respectively.

As of September 30, 2018, there was \$26.4 million in unrecognized compensation cost related to all nonvested PBRsUs. This cost is expected to be recognized over a weighted-average remaining period of 1.47 years.

Employee Stock Purchase Plan

The fair value of shares granted under the Company's employee stock purchase plan ("ESPP") was estimated using a Black-Scholes pricing model with the following weighted-average assumptions:

	Three Months Ended September 30,		Nine Months Ended September 30,			
	2018	2017	2018	2017		
Expected volatility	33 %	39 %	35 %	39 %		%
Expected life	1.33 years	1.44 years	1.53 years	1.47 years		
Risk-free interest rate	2.05 %	0.72 %	1.52 %	0.65 %		%
Dividend yield	—	—	—	—		

During the nine months ended September 30, 2018, 150 thousand shares were purchased under the ESPP at an average price of \$43.04. During the nine months ended September 30, 2017, 103 thousand shares were purchased under the ESPP at an average price of \$40.50.

As of September 30, 2018, there was \$8.1 million in unrecognized compensation cost related to ESPP shares. This cost is expected to be recognized over a weighted-average remaining period of 1.57 years.

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MEDIDATA SOLUTIONS, INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (Unaudited)

Modifications

Aggregate incremental expense associated with modifications to stock options, RSAs and PBRsUs in connection with separation agreements during the three months ended September 30, 2018 and 2017 was \$0.2 million and none, respectively. Incremental expense during the nine months ended September 30, 2018 and 2017 was \$0.6 million and \$0.1 million, respectively.

11. ACCUMULATED OTHER COMPREHENSIVE INCOME (LOSS)

The changes in the balances of each component of accumulated other comprehensive loss during the nine months ended September 30, 2018 are as follows (in thousands):

	Foreign currency translation adjustments	Unrealized gains (losses) on marketable securities	Total
Balance as of January 1, 2018	\$ (2,459)	\$ (918)	\$(3,377)
Other comprehensive loss	(1,199)	154	(1,045)
Balance as of September 30, 2018	\$ (3,658)	\$ (764)	\$(4,422)

For the nine months ended September 30, 2018 and 2017, reclassifications of items from accumulated other comprehensive loss to net income were (\$0.4) million and insignificant, respectively, related to realized (losses) and gains on sales of marketable securities. For further information, see Note 5, "Investments."

12. EARNINGS PER SHARE

Basic earnings per share is calculated by dividing net income available to common stockholders by the weighted-average number of shares outstanding during the period. The holders of unvested RSAs do not have nonforfeitable rights to dividends or dividend equivalents and therefore, such vested awards do not qualify as participating securities and are excluded from the basic earnings per share calculation. Diluted earnings per share includes the determinants of basic net income per share and, in addition, gives effect to the potential dilution that would occur if securities or other contracts to issue common stock are exercised, vested, or converted into common stock, unless they are anti-dilutive.

On August 1, 2018, the Company settled the principal amount of the Notes in cash and issued shares of common stock to settle the conversion premium. For the three and nine months ended September 30, 2017, and for the portion of the three and nine months ended September 30, 2018 that precedes the settlement date, the dilutive effect of the Notes is reflected in diluted earnings per share using the treasury stock method, which considers the number of shares that would have been required to settle the premium above principal at the average stock price for the period. Refer to Note 9, "Debt" for further information on the settlement of the Notes.

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MEDIDATA SOLUTIONS, INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (Unaudited)

A reconciliation of the numerator and denominator of basic earnings per share and diluted earnings per share for the three and nine months ended September 30, 2018 and 2017 is shown in the following table (in thousands, except per share data):

	Three Months Ended September 30, 2018		2017		Nine Months Ended September 30, 2018		2017	
Numerator								
Net income	\$10,688	\$13,043	(1)	\$37,602	\$30,564	(1)		
Denominator								
Denominator for basic earnings per share:								
Weighted average common shares outstanding	58,680	56,654		57,734	56,389			
Denominator for diluted earnings per share:								
Dilutive potential common shares:								
Stock options	851	1,021		886	998			
Restricted stock awards and units	707	905		783	909			
Performance-based restricted stock units	688	657		622	589			
Employee stock purchase plan	296	200		207	136			
Convertible senior notes	490	1,177		770	643			
Weighted average common shares outstanding with assumed conversion	61,712	60,614		61,002	59,664			
Basic earnings per share	\$0.18	\$0.23	(1)	\$0.65	\$0.54	(1)		
Diluted earnings per share	\$0.17	\$0.22	(1)	\$0.62	\$0.51	(1)		

(1) Figures for the three and nine months ended September 30, 2017 have been recast to reflect the Company's January 1, 2018 full retrospective adoption of ASC 606.

Anti-dilutive common stock equivalents excluded from the calculation of diluted earnings per share for the three and nine months ended September 30, 2018 and 2017 are presented in the following table (in thousands, except per share data):

	Three Months Ended September 30, 2018		2017		Nine Months Ended September 30, 2018		2017	
Stock options	82	60	79	99				
Restricted stock awards and units	94	—	110	8				
Performance-based restricted stock units	—	—	—	3				
Employee stock purchase plan	—	—	231	391				
Total	176	60	420	501				

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MEDIDATA SOLUTIONS, INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (Unaudited)

13. INCOME TAXES

Unrecognized Tax Benefits

The Company's unrecognized tax benefits were approximately \$4.1 million as of September 30, 2018, and were unchanged from December 31, 2017.

U.S. Tax Reform

The U.S. Tax Cuts and Jobs Act (the "Tax Act") was enacted on December 22, 2017, is effective January 1, 2018, and introduces significant changes to U.S. income tax law. Due to the timing of the enactment and the complexity involved in applying the provisions of the Tax Act, the Company made a reasonable estimate of the effects and recorded provisional amounts in its financial statements in the fourth quarter of 2017. The Company made immaterial revisions to the provisional amounts during the first quarter of 2018. No further revisions were made during the second and third quarters of 2018. The Company will continue to interpret the Tax Act and any additional guidance issued by the U.S. Treasury Department, the Internal Revenue Service, and other standard-setting bodies, and may make further adjustments to these provisional amounts during the fourth quarter of 2018, which is the last period to make such adjustments.

14. COMMITMENTS AND CONTINGENCIES

Legal Matters — The Company is subject to legal proceedings and claims that arise in the ordinary course of business and records an estimated liability for these matters when an adverse outcome is considered to be probable and can be reasonably estimated. Although the outcome of the litigation cannot be predicted with certainty and some lawsuits, claims, or proceedings may be disposed of unfavorably to the Company, which could materially and adversely affect its financial condition or results of operations, the Company does not believe that it is currently a party to any material legal proceedings.

Contractual Warranties — The Company typically provides contractual warranties to its customers covering its solutions and services. To date, any refunds provided to customers have been immaterial.

Change in Control Agreements — The Company has change in control agreements with its chief executive officer and certain other executive officers. These agreements provide for payments to be made to such officers upon involuntary termination of their employment by the Company without cause or by such officers for good reason as defined in the agreements, within a period of 2 years following a change in control. The agreements provide that, upon a qualifying termination event, such officers will be entitled to (a) a severance payment equal to the sum of the officer's base salary and target bonus amount (except that such payment for the Company's chief executive officer and president would be two times such sum); (b) continuation of health benefits for one year (except that such continuation for the Company's chief executive officer and president would be for two years); and (c) immediate vesting of remaining unvested equity awards, unless otherwise specified in the equity award agreements.

Wire Transaction Claim — During the third quarter of 2018, the Company collected full amount of the judgment that it was awarded in connection with the previously reported wire transaction claim. For full details, see Note 2, "Wire Transaction Recovery."

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MEDIDATA SOLUTIONS, INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (Unaudited)

Item 2. Management's Discussion and Analysis of Financial Condition and Results of Operations

This Quarterly Report on Form 10-Q contains "forward-looking statements" within the meaning of Section 27A of the Securities Act of 1933, as amended ("Securities Act"), and Section 21E of the Securities Exchange Act of 1934, as amended ("Exchange Act"). Forward-looking statements reflect our current estimates, expectations and projections about our future results, performance, prospects and opportunities. Forward-looking statements include, among other things, the information concerning our possible future results of operations, business and growth strategies, financing plans, expectations that regulatory developments or other matters will not have a material adverse effect on our business or financial condition, our competitive position and the effects of competition, the projected growth of the industry in which we operate, the benefits and synergies to be obtained from our completed and any future acquisitions, and statements of management's goals and objectives, and other similar expressions concerning matters that are not historical facts. Words such as "may," "should," "could," "would," "predicts," "potential," "continue," "expects," "anticipates," "future," "intends," "plans," "believes," "estimates," "appears," "projects" and similar expressions, as well as statements in the future tense, identify forward-looking statements. Forward-looking statements should not be read as a guarantee of future performance or results, and will not necessarily be accurate indications of the times at, or by which, such performance or results will be achieved. Forward-looking information is based on information available at the time and/or management's good faith belief with respect to future events, and is subject to risks and uncertainties that could cause actual performance or results to differ materially from those expressed in the statements. Important factors that could cause such differences include, but are not limited to the factors discussed under the "Risk Factors" section included in our Annual Report on Form 10-K for the fiscal year ended December 31, 2017 filed with the Securities and Exchange Commission ("SEC") on February 28, 2018.

The following is a discussion and analysis of our financial condition and results of operations and should be read together with our condensed consolidated financial statements and related notes to condensed consolidated financial statements included elsewhere in this Quarterly Report on Form 10-Q and our audited consolidated financial statements and related notes to audited consolidated financial statements included in our Annual Report on Form 10-K for the fiscal year ended December 31, 2017.

Overview

Our unified platform, pioneering analytics, and clinical technology expertise power the development of new therapies for over one thousand pharmaceutical companies, biotech and medical device firms, academic medical centers, and contract research organizations around the world. The Medidata Clinical Cloud connects patients, physicians, and life sciences professionals, and companies on the Medidata platform are individually and collaboratively reinventing the way research is done to create smarter, more precise treatments.

Third Quarter and Year-to-Date 2018 Highlights

- Total revenues increased 18% and 16% compared with the third quarter and first nine months of 2017, respectively.
- Subscription revenues increased 17% compared with both the third quarter and first nine months of 2017.
- Professional services revenues increased 22% and 15% compared with the third quarter and first nine months of 2017, respectively.
- Operating income decreased 37% and 16% compared with the third quarter and first nine months of 2017, respectively, reflecting a full quarter of expenses related to the acquisition and operations of SHYFT Analytics, Inc. ("SHYFT"), which was acquired on June 20, 2018.
- Net income decreased 18% compared with the third quarter of 2017. Net income increased 23% compared with the first nine months of 2017, inclusive of a \$7.6 million gain on the step acquisition of SHYFT.

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Results of Operations

Revenues

Revenues for the three and nine months ended September 30, 2018 and 2017 were as follows:

	Three Months Ended			Nine Months Ended September 30,		
	September 30, 2018	2017	Change	2018	2017	Change
Revenues:	(amounts in thousands except percentages)					
Subscription	\$137,046	\$117,271	(1)16.9 %	\$394,351	\$338,068	(1)16.6 %
Percentage of total revenues	83.9	% 84.4	%	84.2	% 84.0	%
Professional services	26,360	21,674	(1)21.6 %	74,158	64,548	(1)14.9 %
Percentage of total revenues	16.1	% 15.6	%	15.8	% 16.0	%
Total revenues	\$163,406	\$138,945	17.6 %	\$468,509	\$402,616	16.4 %

(1) Figures for the three and nine months ended September 30, 2017 have been recast to reflect our January 1, 2018 full retrospective adoption of Accounting Standards Codification ("ASC") 606. For additional details, see [Note 1](#), "Summary of Significant Accounting Policies — Recently Adopted Accounting Pronouncements" to the condensed consolidated financial statements included in this Quarterly Report on Form 10-Q.

Year-over-year growth in subscription revenues was driven by sales growth among existing customers, both in the form of additional project subscriptions (which we refer to as "density") and increased usage under existing subscriptions (which we refer to as "intensity"), as well as new customer wins. Our electronic data capture, commercial, payments, and risk-based monitoring solutions were strong contributors. As of September 30, 2018, we had remaining subscription backlog of \$136 million, representing the future contract value of outstanding arrangements, billed and unbilled, to be recognized during the remainder of 2018, excluding renewals. This reflects an increase of 19% compared with remaining backlog of \$114 million at September 30, 2017. As of September 30, 2018, our total multi-year subscription backlog was approximately \$1 billion.

Year-over-year growth in professional services revenues was driven by strong demand from new and existing customers implementing our platform, data analytics, and strategic services.

Cost of Revenues

Cost of revenues for the three and nine months ended September 30, 2018 and 2017 was as follows:

	Three Months Ended			Nine Months Ended		
	September 30, 2018	2017	Change	2018	2017	Change
Cost of revenues:	(amounts in thousands except percentages)					
Subscription	\$24,618	\$17,131	43.7 %	\$66,561	\$51,277	29.8 %
Percentage of total revenues	15.0	% 12.3	%	14.2	% 12.8	%
Professional services	17,609	14,423	22.1 %	49,469	42,811	15.6 %
Percentage of total revenues	10.8	% 10.4	%	10.6	% 10.6	%
Total cost of revenues	\$42,227	\$31,554	33.8 %	\$116,030	\$94,088	23.3 %
Percentage of total revenues	25.8	% 22.7	%	24.8	% 23.4	%

Gross profit	\$121,179	\$107,391		\$352,479	\$308,528	
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Gross margin	74.2	% 77.3	%	75.2	% 76.6	%
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Subscription margin	82.0	% 85.4	%	83.1	% 84.8	%
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Professional services margin	33.2	% 33.5	%	33.3	% 33.7	%
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Year-over-year growth in cost of subscription revenues was primarily driven by increases in depreciation and amortization of \$2.4 million and \$7.5 million for the three and nine months ended September 30, 2018, respectively, associated with additional internally developed and acquired technology assets and purchased hosting equipment.

Expenses were also impacted by higher personnel costs of \$2.6 million and \$3.4 million for the three and nine months

ended September 30, 2018, respectively, resulting from headcount additions in connection with overall business growth and the acquisition of SHYFT, and by increased expenses from software-related contracts with outside vendors of \$1.6 million and \$2.1 million for the three and nine months ended September 30, 2018, respectively.

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Year-over-year growth in cost of professional services was primarily driven by increases in personnel costs associated with a 30% year-over-year headcount increase to support strong customer demand and expanding skill set requirements for professional services, and in connection with our acquisition of SHYFT, partially offset by decreased consulting costs.

Overall gross margin decreased to 74.2% and 75.2% for the three and nine months ended September 30, 2018, respectively, compared with 77.3% and 76.6% for the three and nine months ended September 30, 2017, respectively, driven predominantly by a lower subscription margin reflecting the aforementioned infrastructure and workforce investments, including the acquisition of SHYFT.

Operating Costs and Expenses

Operating costs and expenses for the three and nine months ended September 30, 2018 and 2017 were as follows:

	Three Months Ended September 30,			Nine Months Ended September 30,		
	2018	2017	Change	2018	2017	Change
Operating costs and expenses:	(amounts in thousands except percentages)					
Research and development	\$40,626	\$36,207	12.2 %	\$118,937	\$102,028	16.6 %
Percentage of total revenues	24.9 %	26.1 %		25.4 %	25.3 %	
Sales and marketing	38,329	29,996	(1)27.8 %	112,296	92,701	(1)21.1 %
Percentage of total revenues	23.5 %	21.6 %		23.9 %	23.0 %	
General and administrative	28,105	23,701	18.6 %	80,964	70,772	14.4 %
Percentage of total revenues	17.2 %	17.1 %		17.3 %	17.6 %	
Wire transaction recovery	—	(4,770)	(100.0)%	—	(4,770)	(100.0)%
Percentage of total revenues	— %	(3.5)%		— %	(1.2)%	
Total operating costs and expenses	\$107,060	\$85,134	25.8 %	\$312,197	\$260,731	19.7 %
Percentage of total revenues	65.6 %	61.3 %		66.6 %	64.7 %	
Operating income	\$14,119	\$22,257	(36.6)%	\$40,282	\$47,797	(15.7)%
Operating margin	8.6 %	16.0 %		8.6 %	11.9 %	

(1) Figures for the three and nine months ended September 30, 2017 have been recast to reflect our January 1, 2018 full retrospective adoption of ASC 606. For additional details, see Note 1, "Summary of Significant Accounting Policies — Recently Adopted Accounting Pronouncements" to the condensed consolidated financial statements included in this Quarterly Report on Form 10-Q.

The year-over-year growth in research and development expenses was primarily driven by increases in personnel costs of \$3.4 million and \$11.5 million for the three and nine months ended September 30, 2018, respectively, resulting from a 16% year-over-year headcount increase due to our continued hiring of skilled engineering talent and our acquisitions. Research and development expenses were also impacted by increased costs for specialized consultants and outside experts of \$1.4 million and \$3.9 million for the three and nine months ended September 30, 2018, respectively, and higher third-party software costs of \$0.4 million and \$2.2 million for the three and nine months ended September 30, 2018, respectively.

The year-over-year growth in sales and marketing expenses was predominantly driven by increases in personnel costs of \$6.4 million and \$16.0 million for the three and nine months ended September 30, 2018, respectively, resulting from a 26% year-over-year headcount increase in connection with expansion of our global sales organization and partner team, as well as the acquisition of SHYFT. Expenses were also impacted by increases in travel costs, associated with our global customer wins, of \$0.2 million and \$1.3 million for the three and nine months ended September 30, 2018, respectively.

The year-over-year increase in general and administrative expenses was primarily driven by increases in personnel costs of \$4.4 million and \$7.5 million for the three and nine months ended September 30, 2018, respectively, resulting from an 11% year-over-year headcount increase. For the nine months ended September 30, 2018, expenses were also impacted by higher legal and professional fees of \$0.8 million, associated mainly with litigation matters and our acquisition of SHYFT.

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Interest and Other Income (Expense), net

Interest and other income (expense) for the three and nine months ended September 30, 2018 and 2017 was as follows:

	Three Months Ended September 30, 2018			Nine Months Ended September 30, 2017		
	2018	2017	Change	2018	2017	Change
	(amounts in thousands)					
Interest and other income (expense)						
Interest expense	(\$3,147)	(\$4,407)		\$(14,422)	\$(13,117)	
Interest income	2,128	1,531		6,544	4,030	
Other (expense) income, net	(389)	(7)		7,244	(7)	
Total interest and other expense, net	(\$1,408)	(\$2,883)	(51.2)%	\$(634)	\$(9,094)	(93.0)%

The year-over-year decrease in total interest and other expense for the three months ended September 30, 2018 was primarily driven by a decrease in interest expense of \$2.5 million as a result of the settlement of our 1.00% convertible senior notes (the "Notes") on August 1, 2018, and \$1.1 million of interest income associated with the wire transaction recovery, partially offset by new interest expense on our credit facility of \$1.2 million and decreased interest income on our available-for sale marketable securities. The year-over-year decrease in total interest and other expense for the nine months ended September 30, 2018 was primarily driven by a gain on step acquisition of SHYFT of \$7.6 million, a decrease in interest expense of \$2.1 million as a result of the settlement of the Notes on August 1, 2018, \$1.1 million of interest income associated with the wire transaction recovery, and increased interest income on our available-for sale marketable securities, partially offset by new interest expense on our credit facility of \$3.4 million.

Income Taxes

Provision for income taxes for the three and nine months ended September 30, 2018 and 2017 was as follows:

	Three Months Ended September 30, 2018		Nine Months Ended September 30, 2017	
	2018	2017	2018	2017
	(amounts in thousands)			
Provision for income taxes	\$2,023	\$6,331	(\$2,046)	\$8,139

(1) Figures for the three and nine months ended September 30, 2017 have been recast to reflect our January 1, 2018 full retrospective adoption of ASC 606.

The difference between our effective tax rate and the U.S. statutory rate is primarily due to the relative mix of pre-tax income subject to tax in various jurisdictions, state taxes, share-based compensation, and U.S. tax credits and incentives. The benefits from U.S. credits and incentives will likely continue to have a favorable impact on our overall effective tax rate in the future. Stock-based compensation will also continue to have an impact on our effective tax rate which may or may not be favorable.

Our quarterly tax provision and quarterly estimate of the annual effective tax rate are subject to significant variation due to several factors, including variability in accuracy of predictions of pre-tax book and taxable income or loss, the mix of jurisdictions to which they relate, and changes in tax law in the jurisdictions in which we conduct business. The U.S. Tax Cuts and Jobs Act (the "Tax Act") was enacted in December 2017, and introduced significant changes to U.S. income tax law, including, among other things, reducing the corporate tax rate from 35% to 21% effective 2018. Due to the timing of the enactment and the complexity involved in applying the provisions of the Tax Act, we made a reasonable estimate of the effects of the new law and recorded a provisional net charge of \$4.0 million in the fourth quarter of 2017 in accordance with Staff Accounting Bulletin ("SAB") No. 118. We have continued to interpret the Tax Act and, given recent and anticipated guidance from the U.S Treasury Department, the Internal Revenue Service, and other standard-setting bodies, our provisional charge may be adjusted during 2018, with the expectation that it will be finalized no later than the fourth quarter of 2018, as provided for in SAB No. 118. Other provisions of the Tax Act that impact future tax years are still being assessed.

Critical Accounting Estimates

Our condensed consolidated financial statements are prepared in conformity with accounting principles generally accepted in the United States of America, which require us to make estimates and assumptions about certain items and future events. These estimates inherently involve levels of subjectivity and judgment and may have a material impact on our financial condition or results of operations. Accordingly, actual results could differ from those estimates. Except as described below, our critical accounting estimates as of September 30, 2018 are the same as those at December 31, 2017, which are included in our Annual Report on Form 10-K for the fiscal year ended December 31, 2017. Also see Note 1, "Summary of Significant Accounting Policies," to the condensed consolidated financial statements included in this Quarterly Report on Form 10-Q, which discusses our significant accounting policies.

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Revenue Recognition

We recognize revenue when control of promised goods or services is transferred to customers, in an amount that reflects the consideration we expect to be entitled to in exchange for those goods or services. To determine the amount of revenue to be recognized, we apply the following five steps:

- identify the contract with a customer;
- identify the performance obligations in the contract;
- determine the transaction price;
- allocate the transaction price to performance obligations in the contract; and
- recognize revenue as the performance obligation is satisfied.

The application of these steps is inherently subjective.

With regard to identification of contracts, contract modifications are common in our business, and we exercise judgment in determining whether each of those modifications constitutes a separate contract, a cancellation of an old and execution of a new contract, or the continuation of a single performance obligation.

To identify the performance obligations within a contract, we must exercise judgment with regard to whether the promises within the contract are capable of being distinct and are separately identifiable from other promises in the contract.

With regard to determination of transaction price, although most of our contracts state a fixed price, from time to time, contracts may include variable consideration; in these cases, we are required to estimate the amount of consideration we ultimately expect to be entitled to, based upon factors such as our historical experience and our assessment of the probability of a range of outcomes.

When allocating the transaction price to performance obligations, we rely on a determination of standalone selling price. If standalone selling price is not observable, it must be estimated. We most commonly estimate standalone selling price using an adjusted market assessment approach that relies on a range of historical selling prices at which that deliverable was sold to other customers that we deem to be economically similar.

With regard to satisfaction of performance obligations, for professional services arrangements that bear a fixed price, we measure our delivery progress using a proportional performance method, which relies on our estimate of the total number of hours that will be required to fully satisfy the obligation.

Effects of Recently Issued Accounting Pronouncements on Current and Future Trends

Refer to Note 1, "Summary of Significant Accounting Policies — Recently Issued Accounting Pronouncements," to the condensed consolidated financial statements included in this Quarterly Report on Form 10-Q. No other recently issued accounting pronouncements have had or are expected to have a material impact on our current or future trends.

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Liquidity and Capital Resources

We believe that our cash flows from operations, cash and cash equivalents, and highly liquid marketable securities will be sufficient to satisfy the anticipated cash requirements associated with our existing operations for the foreseeable future. Our future capital expenditures and other cash requirements could be higher than we currently expect as a result of various factors, including any expansion of our business that we may complete. The following table presents selected financial information related to our liquidity and capital resources as of September 30, 2018 and December 31, 2017, and for the nine months ended September 30, 2018 and 2017 (in thousands):

	September 30, 2018		December 31, 2017	
Cash, cash equivalents, and marketable securities	\$218,457		\$663,333	
Furniture, fixtures and equipment, net	96,753		88,091	
1.00% convertible senior notes, net	—		278,094	
Term loan, net (including current maturities)	94,417		97,841	
	Nine Months Ended			
	September 30, 2018		September 30, 2017	
Cash provided by operating activities	\$57,247		\$91,574	
Cash provided by (used in) investing activities	83,066		(57,675)	
Cash (used in) provided by financing activities	(293,675)		181	

Cash, Cash Equivalents, and Marketable Securities

For the nine months ended September 30, 2018, cash provided by operating activities of \$57.2 million was driven by customer collections, partially offset by operating expenditures and cash interest expense on the Notes and term loan. Cash used in investing activities of \$83.1 million consisted of net payments of \$179.1 million to acquire SHYFT and cash payments for capital expenditures of \$28.9 million, partially offset by net sales of marketable securities of \$291.1 million to generate cash to settle the Notes, which matured on August 1, 2018. Cash used in financing activities of \$293.7 million was driven by the repayment of the \$287.5 million principal amount of the Notes, the acquisition of \$19.5 million of treasury stock in connection with equity plan participant tax withholdings upon vesting, \$4.4 million in earn-out payments related to the 2017 acquisition of CHITA Inc. ("CHITA"), \$3.8 million in term loan principal payments, and \$0.2 million in payments of credit facility financing costs, partially offset by equity plan proceeds of \$21.7 million.

For the nine months ended September 30, 2017, cash provided by operating activities of \$91.6 million was driven by customer collections, partially offset by operating expenditures and cash interest expense on the Notes. Cash used in investing activities of \$57.7 million consisted of net payments of \$22.9 million in aggregate to acquire CHITA and Mytrus, Incorporated ("Mytrus"), cash payments for capital expenditures of \$30.5 million, and net purchases of marketable securities of \$4.2 million. Cash provided by financing activities of \$0.2 million resulted from the equity plan proceeds of \$16.5 million, partially offset by the acquisition of \$16.3 million of treasury stock in connection with equity plan participant tax withholdings upon vesting.

Capital Assets

We acquired \$29.6 million in capital assets during the nine months ended September 30, 2018, predominantly related to continued enhancements to our existing infrastructure and facilities and capitalization of software development costs. On a cash basis, our capital expenditures during the nine months ended September 30, 2018 were \$28.9 million and included payments for previously accrued assets. We expect to acquire approximately \$10 million in additional capital assets during the remainder of 2018.

Debt

In August 2013, we issued the Notes, which matured on August 1, 2018. We settled the \$287.5 million principal amount of the Notes in cash and the conversion premium in shares of our common stock. We issued 1.4 million shares of common stock in settlement of the premium, determined by a calculation based on the volume-weighted average price of our common stock over the 40 trading-day observation period beginning on and including June 1, 2018, as

specified in the indenture governing the Notes.

In December 2017, we entered into a credit agreement that provides us with a senior secured first lien credit facility in an aggregate principal amount of \$500.0 million, consisting of (a) term loans in an aggregate principal amount of \$100.0 million and (b) revolving commitments in an aggregate principal amount of \$400.0 million. The credit facility is scheduled to mature on December 21, 2022, with the term loans payable in quarterly installments. We intend to use the net proceeds from our debt for working capital and other general corporate purposes, including possible acquisitions of, or investments in, businesses, technologies, or products complementary to our business.

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For further information, see Note 9, "Debt," to our condensed consolidated financial statements included in this Quarterly Report on Form 10-Q.

Contractual Obligations, Commitments and Contingencies

There was no material change in our contractual obligations during the first nine months of 2018.

Legal Matters

For a discussion of legal matters, refer to Note 14, "Commitments and Contingencies — Legal Matters," to the condensed consolidated financial statements included in this Quarterly Report on Form 10-Q.

Item 3. Quantitative and Qualitative Disclosures about Market Risk

Interest Rate Sensitivity

We had unrestricted cash and cash equivalents totaling \$83.5 million at September 30, 2018. Our cash equivalents are invested principally in money market funds. We also had investments in marketable securities, which we classify as available-for-sale securities, totaling \$135.0 million at September 30, 2018. Substantially all of our marketable securities are fixed income securities, which primarily consist of high quality commercial paper and corporate bonds. Due to the short duration, laddered maturities, and high credit ratings of these investments, we believe that we do not have any material exposure to changes in the fair value of our investment portfolio as a result of changes in interest rates.

Our exposure to interest rate risk mainly relates to current and future borrowings under our credit facility. Based on the \$96.3 million of term loan principal outstanding under our credit facility as of September 30, 2018, the estimated potential impact of a hypothetical 1% increase in interest rate would amount to \$0.7 million for the nine months ended September 30, 2018.

Exchange Rate Sensitivity

Our non-U.S. operating subsidiaries are located in the United Kingdom, Japan, South Korea, Singapore, China, and Germany. The functional currencies for these subsidiaries are the respective local currencies. We have exposure to exchange rate movements that are captured in translation adjustments for these subsidiaries. Such cumulative adjustments are recorded in accumulated other comprehensive income (loss). The estimated potential translation loss for the nine months ended September 30, 2018 resulting from a hypothetical 10% adverse change in quoted foreign currency exchange rates amounted to \$3.4 million.

We bill our customers primarily in U.S. dollars. The majority of our foreign billings are billed from Medidata Solutions, Inc., a U.S. entity, and are mainly denominated in Euros, British pounds sterling, Australian dollars, and Canadian dollars. Our foreign currency-denominated costs and expenses are mainly incurred by our non-U.S. operating subsidiaries. Accordingly, future changes in currency exchange rates will impact our future operating results. For the nine months ended September 30, 2018, 4.4% of our revenues and 16.7% of our expenses were denominated in foreign currencies. Total loss arising from transactions denominated in foreign currencies amounted to \$0.8 million for the nine months ended September 30, 2018.

Impact of Inflation

We do not believe that inflation has had a material impact on our business, financial condition, or results of operations.

Item 4. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

As of September 30, 2018, an evaluation was performed with the participation of our Disclosure Committee and our management, including the Chief Executive Officer ("CEO") and the Chief Financial Officer ("CFO") of the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act). Disclosure controls and procedures are controls and procedures that are designed to ensure that information required to be disclosed in our reports filed or submitted under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures are also designed to ensure that such information is accumulated and communicated to our management, including our CEO and CFO, as appropriate to allow timely decisions regarding required disclosure. Based upon such evaluation, our CEO and CFO have concluded that our disclosure controls and procedures were effective as of September 30, 2018.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting during our most recent fiscal quarter that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

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PART II - OTHER INFORMATION

Item 1. Legal Proceedings

See Note 14, "Commitments and Contingencies – Legal Matters," to the condensed consolidated financial statements included in this Quarterly Report on Form 10-Q for a description of current legal proceedings.

Item 1A. Risk Factors

We operate in a rapidly changing environment that involves a number of risks, some of which are beyond our control. The risks described in our Annual Report on Form 10-K for the fiscal year ended December 31, 2017 are those that we believe are the material risks we face. There have been no material changes in our risk factors since our Annual Report on Form 10-K for the fiscal year ended December 31, 2017. Any of those disclosed risk factors or additional risks and uncertainties not presently known to us, or that we currently deem immaterial, could have a material adverse effect on our business, financial condition and results of operations.

Item 2. Unregistered Sales of Equity Securities and Use of Proceeds

Purchases of Equity Securities by the Issuer and Affiliated Purchasers

From time to time, we grant nonvested restricted stock awards, restricted stock units, or performance-based restricted stock units to our employees pursuant to the terms of our Amended and Restated 2017 Long-Term Incentive Plan ("2017 Plan") and formerly pursuant to the terms of our Second Amended and Restated 2009 Long-Term Incentive Plan ("2009 Plan"). Under the provisions of the 2017 Plan and 2009 Plan, unless otherwise elected, participants fulfill their related income tax withholding obligation by having shares withheld at the time of vesting. On the date of vesting, we divide the participant's income tax withholding obligation in dollars by the closing price of our common stock and withhold the resulting number of vested shares.

A summary of our repurchases of shares of our common stock for the three months ended September 30, 2018 is as follows:

	Total Number of Shares Purchased (1)	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Maximum Number of Shares that May Yet be Purchased under the Plans or Programs
July 1 – July 31, 2018	4,345	\$ 80.89	—	—
August 1 – August 31, 2018	2,923	\$ 74.66	—	—
September 1 – September 30, 2018	8,031	\$ 84.98	—	—
Total	15,299	\$ 81.85	—	—

(1) Represents the number of shares acquired as payment by employees of applicable statutory withholding taxes owed upon vesting of restricted stock awards, restricted stock units, or performance-based restricted stock units granted under the 2017 Plan and 2009 Plan.

Item 3. Defaults upon Senior Securities

None.

Item 4. Mine Safety Disclosures

Not applicable.

Item 5. Other Information

None.

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Item 6. Exhibits

Exhibit No. Description

<u>31.1*</u>	<u>Certification of CEO pursuant to Rule 13a-14(a) or Rule 15d-14(a) under the Exchange Act</u>
<u>31.2*</u>	<u>Certification of CFO pursuant to Rule 13a-14(a) or Rule 15d-14(a) under the Exchange Act</u>
<u>32.1**</u>	<u>Certification of CEO pursuant to Rules 13a-14(b) or 15d-14(b) under the Exchange Act and 18 U.S.C. 1350</u>
<u>32.2**</u>	<u>Certification of CFO pursuant to Rules 13a-14(b) or 15d-14(b) under the Exchange Act and 18 U.S.C. 1350</u>
101.INS*	XBRL Instance Document
101.SCH*	XBRL Taxonomy Extension Schema Document
101.CAL*	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF*	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB*	XBRL Taxonomy Extension Label Linkbase Document
101.PRE*	XBRL Taxonomy Extension Presentation Linkbase Document

*Filed herewith.

**Furnished herewith.

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Signature

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

MEDIDATA SOLUTIONS, INC.

By: /s/ ROUVEN BERGMANN

Rouven Bergmann

Chief Financial Officer (Principal Financial and Principal Accounting Officer)

Date: October 30, 2018

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