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

FORM 10-Q

(MARK ONE)

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

FOR THE QUARTERLY PERIOD ENDED JULY 31, 2021

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: 000-19807

SYNOPSYS, INC.

(Exact name of registrant as specified in its charter)

Delaware	**56-1546236**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification Number)**

690 EAST MIDDLEFIELD ROAD
MOUNTAIN VIEW, CA 94043
(Address of principal executive offices, including zip code)

(650) 584-5000
(Registrant's telephone number, including area code)

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock (par value of $0.01 per share)	**SNPS**	**Nasdaq Global Select Market**

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

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

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

Large accelerated filer	☒	Accelerated Filer	☐
Non-accelerated filer	☐	Smaller reporting company	☐
		Emerging growth company	☐

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

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

As of August 18, 2021, there were 152,502,754 shares of the registrant's common stock outstanding.

SYNOPSYS, INC.

QUARTERLY REPORT ON FORM 10-Q
FOR THE FISCAL QUARTER ENDED JULY 31, 2021

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PART I. FINANCIAL INFORMATION

Item 1. *Financial Statements*

SYNOPSYS, INC.

UNAUDITED CONDENSED CONSOLIDATED BALANCE SHEETS
(in thousands, except par value amounts)

	July 31, 2021	October 31, 2020*
ASSETS		
Current assets:		
Cash and cash equivalents	$ 1,385,395	$ 1,235,653
Short-term investments	144,773	—
Total cash, cash equivalents and short-term investments	1,530,168	1,235,653
Accounts receivable, net	577,845	780,709
Inventories, net	241,103	192,333
Income taxes receivable and prepaid taxes	35,724	32,355
Prepaid and other current assets	379,136	308,167
Total current assets	2,763,976	2,549,217
Property and equipment, net	470,129	483,818
Operating lease right-of-use assets, net	493,899	465,818
Goodwill	3,485,181	3,365,114
Intangible assets, net	249,974	254,322
Long-term prepaid taxes	10,417	8,276
Deferred income taxes	527,753	497,546
Other long-term assets	484,577	405,951
Total assets	$ 8,485,906	$ 8,030,062
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable and accrued liabilities	$ 615,737	$ 623,664
Operating lease liabilities, current	79,289	73,173
Accrued income taxes	14,536	27,738
Deferred revenue	1,542,606	1,388,263
Short-term debt	82,468	27,084
Total current liabilities	2,334,636	2,139,922
Operating lease liabilities, non-current	487,574	462,411
Long-term accrued income taxes	24,600	25,178
Long-term deferred revenue	103,759	104,850
Long-term debt	24,754	100,823
Other long-term liabilities	355,447	284,511
Total liabilities	3,330,770	3,117,695
Stockholders' equity:		
Preferred stock, $0.01 par value: 2,000 shares authorized; none outstanding	—	—
Common stock, $0.01 par value: 400,000 shares authorized; 152,597 and 152,618 shares outstanding, respectively	1,526	1,528
Capital in excess of par value	1,606,980	1,653,166
Retained earnings	4,348,266	3,795,397
Treasury stock, at cost: 4,664 and 4,643 shares, respectively	(757,341)	(488,613)
Accumulated other comprehensive income (loss)	(48,411)	(54,074)
Total Synopsys stockholders' equity	5,151,020	4,907,404
Non-controlling interest	4,116	4,963
Total stockholders' equity	5,155,136	4,912,367
Total liabilities and stockholders' equity	$ 8,485,906	$ 8,030,062

*Derived from audited financial statements.

See accompanying notes to unaudited condensed consolidated financial statements.

SYNOPSYS, INC.

UNAUDITED CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS
(in thousands, except per share amounts)

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2021	2020	2021	2020
Revenue:				
Time-based products	$ 665,563	$ 612,065	$ 1,945,647	$ 1,758,601
Upfront products	203,301	210,931	586,798	491,417
Maintenance and service	188,266	141,138	519,329	409,824
Total revenue	1,057,130	964,134	3,051,774	2,659,842
Cost of revenue:				
Products	127,592	118,478	389,677	344,469
Maintenance and service	65,604	60,812	202,210	184,940
Amortization of intangible assets	11,870	13,718	35,164	40,732
Total cost of revenue	205,066	193,008	627,051	570,141
Gross margin	852,064	771,126	2,424,723	2,089,701
Operating expenses:				
Research and development	371,146	322,602	1,090,959	939,456
Sales and marketing	171,428	156,456	514,810	455,511
General and administrative	83,846	73,516	234,028	204,734
Amortization of intangible assets	8,570	9,931	25,273	29,545
Restructuring charges	15,151	(1,977)	15,151	36,446
Total operating expenses	650,141	560,528	1,880,221	1,665,692
Operating income	201,923	210,598	544,502	424,009
Other income (expense), net	11,414	26,256	61,934	22,584
Income before income taxes	213,337	236,854	606,436	446,593
Provision (benefit) for income taxes	14,945	(16,057)	51,214	(20,299)
Net income	$ 198,392	$ 252,911	$ 555,222	$ 466,892
Net income (loss) attributed to non-controlling interest	(254)	—	(847)	—
Net income attributed to Synopsys	$ 198,646	$ 252,911	$ 556,069	$ 466,892
Net income per share attributed to Synopsys:				
Basic	$ 1.30	$ 1.67	$ 3.64	$ 3.10
Diluted	$ 1.27	$ 1.62	$ 3.54	$ 3.01
Shares used in computing per share amounts:				
Basic	152,635	151,352	152,619	150,731
Diluted	156,907	155,973	157,158	155,074

See accompanying notes to unaudited condensed consolidated financial statements.

SYNOPSYS, INC.

UNAUDITED CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(in thousands)

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2021	2020	2021	2020
Net income	$ 198,392	$ 252,911	$ 555,222	$ 466,892
Other comprehensive income (loss):				
Change in foreign currency translation adjustment	(5,905)	18,102	8,857	14,099
Changes in unrealized gains (losses) on available-for-sale securities, net of tax of $0 for periods presented	15	—	15	—
Cash flow hedges:				
Deferred gains (losses), net of tax of $(909) and $(1,876), for the three and nine months ended July 31, 2021, respectively, and of $(4,169) and $(1,823) for each of the same periods in fiscal 2020, respectively.	3,664	12,399	8,971	3,965
Reclassification adjustment on deferred (gains) losses included in net income, net of tax of $1,460 and $3,808, for the three and nine months ended July 31, 2021, respectively, and of $(134) and $(262) for each of the same periods in fiscal 2020, respectively.	(4,830)	709	(12,180)	1,563
Other comprehensive income (loss), net of tax effects	(7,056)	31,210	5,663	19,627
Comprehensive income	191,336	284,121	560,885	486,519
Less: net income (loss) attributed to non-controlling interest	(254)	—	(847)	—
Comprehensive income attributed to Synopsys	$ 191,590	$ 284,121	$ 561,732	$ 486,519

See accompanying notes to unaudited condensed consolidated financial statements.

SYNOPSYS, INC.

UNAUDITED CONDENSED CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(in thousands)

	Common Stock		Capital in Excess of Par Value	Retained Earnings	Treasury Stock	Accumulated Other Comprehensive Income (Loss)	Total Synopsys Stockholders' Equity	Non-controlling Interest	Stockholders' Equity
	Shares	Amount							
Balance at April 30, 2021	152,554	$ 1,526	$ 1,679,801	$ 4,149,620	$ (701,457)	$ (41,355)	$ 5,088,135	$ 4,370	$ 5,092,505
Net income				198,646			198,646	(254)	198,392
Other comprehensive income (loss), net of tax effects						(7,056)	(7,056)		(7,056)
Purchases of treasury stock	(521)	(5)	5		(140,000)		(140,000)		(140,000)
Equity forward contract			(35,000)				(35,000)		(35,000)
Common stock issued, net of shares withheld for employee taxes	564	5	(122,988)		84,116		(38,867)		(38,867)
Stock-based compensation			85,162				85,162		85,162
Balance at July 31, 2021	152,597	$ 1,526	$ 1,606,980	$ 4,348,266	$ (757,341)	$ (48,411)	$ 5,151,020	$ 4,116	$ 5,155,136
Balance at October 31, 2020	152,618	$ 1,528	$ 1,653,166	$ 3,795,397	$ (488,613)	$ (54,074)	$ 4,907,404	$ 4,963	$ 4,912,367
Net income				556,069			556,069	(847)	555,222
Retained earnings adjustment due to adoption of ASC 326[1]				(3,200)			(3,200)		(3,200)
Other comprehensive income (loss), net of tax effects						5,663	5,663		5,663
Purchases of treasury stock	(2,114)	(21)	21		(538,082)		(538,082)		(538,082)
Equity forward contract			(35,000)		—		(35,000)		(35,000)
Common stock issued, net of shares withheld for employee taxes	2,093	19	(259,737)		269,354		9,636		9,636
Stock-based compensation			248,530				248,530		248,530
Balance at July 31, 2021	152,597	$ 1,526	$ 1,606,980	$ 4,348,266	$ (757,341)	$ (48,411)	$ 5,151,020	$ 4,116	$ 5,155,136

	Common Stock		Capital in Excess of Par Value	Retained Earnings	Treasury Stock	Accumulated Other Comprehensive Income (Loss)	Total Synopsys Stockholders' Equity	Non-controlling Interest	Stockholders' Equity
	Shares	Amount							
Balance at April 30, 2020	150,908	$ 1,509	$ 1,655,787	$ 3,356,489	$ (634,669)	$ (104,030)	$ 4,275,086	$ 5,863	$ 4,280,949
Net income				252,911			252,911	(471)	252,440
Other comprehensive income (loss), net of tax effects						31,210	31,210		31,210
Purchases of treasury stock	(149)				(20,000)		(20,000)		(20,000)
Equity forward contract			20,000				20,000		20,000
Common stock issued, net of shares withheld for employee taxes	999	10	(114,038)	(11,456)	100,365		(25,119)		(25,119)
Stock-based compensation			61,837				61,837		61,837
Balance at July 31, 2020	151,758	$ 1,519	$ 1,623,586	$ 3,597,944	$ (554,304)	$ (72,820)	$ 4,595,925	$ 5,392	$ 4,601,317
Balance at October 31, 2019	150,331	$ 1,503	$ 1,635,455	$ 3,164,144	$ (625,642)	$ (92,447)	$ 4,083,013	$ 5,863	$ 4,088,876
Net income				466,892			466,892	(471)	466,421
Other comprehensive income (loss), net of tax effects						19,627	19,627		19,627
Purchases of treasury stock	(1,380)	(12)	12		(200,000)		(200,000)		(200,000)
Common stock issued, net of shares withheld for employee taxes	2,807	28	(182,036)	(33,092)	271,338		56,238		56,238
Stock-based compensation			170,155				170,155		170,155
Balance at July 31, 2020	151,758	$ 1,519	$ 1,623,586	$ 3,597,944	$ (554,304)	$ (72,820)	$ 4,595,925	$ 5,392	$ 4,601,317

[1] In June 2016, the Financial Accounting Standards Board (FASB) issued ASC 326, "Measurement of Credit Losses on Financial Instruments", which replaces the incurred loss methodology with an expected loss methodology. The Company adopted the new standard at the beginning of fiscal 2021.

See accompanying notes to unaudited condensed consolidated financial statements.

SYNOPSYS, INC.

UNAUDITED CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
(in thousands)

	Nine Months Ended July 31,	
	2021	2020
Cash flows from operating activities:		
Net income attributed to Synopsys	$ 556,069	$ 466,892
Adjustments to reconcile net income to net cash provided by operating activities:		
Amortization and depreciation	151,274	159,156
Reduction of operating lease right-of-use assets	64,920	62,585
Amortization of capitalized costs to obtain revenue contracts	46,973	44,851
Stock-based compensation	248,530	170,155
Allowance for doubtful accounts	13,813	14,875
Deferred income taxes	(33,116)	(74,374)
Other non-cash	2,936	756
Net changes in operating assets and liabilities, net of acquired assets and liabilities:		
Accounts receivable	188,996	(89,667)
Inventories	(51,448)	(20,296)
Prepaid and other current assets	(62,201)	(21,350)
Other long-term assets	(117,922)	(77,860)
Accounts payable and accrued liabilities	51,991	44,313
Operating lease liabilities	(61,666)	(57,968)
Income taxes	(29,414)	6,128
Deferred revenue	152,328	160,966
Net cash provided by operating activities	1,122,063	789,162
Cash flows from investing activities:		
Proceeds from sales and maturities of short-term investments	1,128	—
Purchases of short-term investments	(146,082)	—
Proceeds from sales of long-term investments	—	2,151
Purchases of long-term investments	(7,591)	(2,762)
Purchases of property and equipment	(66,957)	(120,234)
Cash paid for acquisitions, net of cash acquired	(164,053)	(201,045)
Capitalization of software development costs	(1,517)	(3,035)
Other	(800)	—
Net cash used in investing activities	(385,872)	(324,925)
Cash flows from financing activities:		
Proceeds from credit facilities	—	276,490
Repayment of debt	(21,637)	(284,218)
Issuances of common stock	113,976	123,237
Payments for taxes related to net share settlement of equity awards	(104,291)	(66,985)
Purchase of equity forward contract	(35,000)	—
Purchases of treasury stock	(538,082)	(200,000)
Other	(4,375)	—
Net cash used in financing activities	(589,409)	(151,476)
Effect of exchange rate changes on cash, cash equivalents and restricted cash	2,985	8,700
Net change in cash, cash equivalents and restricted cash	149,767	321,461
Cash, cash equivalents and restricted cash, beginning of year	1,237,970	730,527
Cash, cash equivalents and restricted cash, end of period	$ 1,387,737	$ 1,051,988

See accompanying notes to unaudited condensed consolidated financial statements.

NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS

Note 1. Description of Business

Synopsys, Inc. (Synopsys or the Company) provides products and services used across the entire silicon to software spectrum, from engineers creating advanced semiconductors to software developers seeking to ensure the security and quality of their code. The Company is a global leader in supplying the electronic design automation (EDA) software that engineers use to design and test integrated circuits (ICs), also known as chips. The Company also offers semiconductor intellectual property (IP) products, which are pre-designed circuits that engineers use as components of larger chip designs rather than designing those circuits themselves. The Company provides software and hardware used to validate the electronic systems that incorporate chips and the software that runs on them. To complement these offerings, the Company provides technical services and support to help its customers develop advanced chips and electronic systems. These products and services are part of the Company's Semiconductor & System Design segment.

The Company is also a leading provider of software tools and services that improve the security, quality and compliance of software in a wide variety of industries, including electronics, financial services, automotive, medicine, energy and industrials. These tools and services are part of the Company's Software Integrity segment.

Note 2. Summary of Significant Accounting Policies

The Company has prepared the accompanying unaudited condensed consolidated financial statements pursuant to the rules and regulations of the Securities and Exchange Commission (SEC). Pursuant to these rules and regulations, the Company has condensed or omitted certain information and footnote disclosures it normally includes in its annual consolidated financial statements prepared in accordance with U.S. generally accepted accounting principles (U.S. GAAP). In management's opinion, the Company has made all adjustments (consisting only of normal, recurring adjustments, except as otherwise indicated) necessary to fairly present its unaudited condensed consolidated balance sheets, results of operations, comprehensive income, stockholders' equity and cash flows. The Company's interim period operating results do not necessarily indicate the results that may be expected for any other interim period or for the full fiscal year. These financial statements and accompanying notes should be read in conjunction with the consolidated financial statements and notes thereto in the Company's Annual Report on Form 10-K for the fiscal year ended October 31, 2020 as filed with the SEC on December 15, 2020.

Use of Estimates. To prepare financial statements in conformity with U.S. GAAP, management must make estimates and assumptions that affect the amounts reported in the unaudited condensed consolidated financial statements and accompanying notes. Actual results could differ from these estimates and may result in material effects on the Company's operating results and financial position. In addition, the Company has considered the impact of the COVID-19 pandemic on the business operations and no impairments or other effects have been identified to date. Although the impact related to the COVID-19 pandemic has been limited in operating results thus far, there is substantial uncertainty in the nature and degree of its continued effects over time. This uncertainty affects management's accounting estimates and assumptions, which could result in greater variability in a variety of areas that depend on these estimates and assumptions as additional events and information are known.

Principles of Consolidation. The unaudited condensed consolidated financial statements include the accounts of the Company and all of its subsidiaries. All intercompany accounts and transactions have been eliminated.

Fiscal Year End. The Company's fiscal year generally ends on the Saturday nearest to October 31 and consists of 52 weeks, with the exception that approximately every five years, the Company has a 53-week year. When a 53-week year occurs, the Company includes the additional week in the first quarter to realign fiscal quarters with calendar quarters. Fiscal 2021 and 2020 are both 52-week years. Fiscal 2021 will end on October 30, 2021. Fiscal 2020 ended on October 31, 2020. For presentation purposes, the unaudited condensed consolidated financial statements and accompanying notes refer to the closest calendar month end.

Note 3. Revenue

Disaggregated Revenue

The following table shows the percentage of revenue by product groups:

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2021	2020	2021	2020
EDA	55.8 %	55.2 %	56.2 %	57.7 %
IP & System Integration	34.4 %	34.8 %	34.2 %	32.0 %
Software Integrity Products & Services	9.3 %	9.7 %	9.3 %	10.0 %
Other	0.5 %	0.3 %	0.3 %	0.3 %
Total	100.0 %	100.0 %	100.0 %	100.0 %

Contract Balances

The contract assets indicated below are presented as prepaid and other current assets in the unaudited condensed consolidated balance sheets. The contract assets are transferred to receivables when the rights to invoice and receive payment become unconditional. Unbilled receivables are presented as accounts receivable, net, in the unaudited condensed consolidated balance sheets.

Contract balances are as follows:

	As of	
	July 31, 2021	October 31, 2020
	(in thousands)	
Contract assets	$ 246,815	$ 214,583
Unbilled receivables	$ 45,855	$ 50,932
Deferred revenue	$ 1,646,365	$ 1,493,113

During the three and nine months ended July 31, 2021, the Company recognized $134.9 million and $1.0 billion, respectively, of revenue that was included in the deferred revenue balance as of October 31, 2020.

Contracted but unsatisfied or partially unsatisfied performance obligations were approximately $4.7 billion as of July 31, 2021, which includes $788.8 million in non-cancellable Flexible Spending Account (FSA) commitments from customers where actual product selection and quantities of specific products or services are to be determined by customers at a later date. The Company has elected to exclude future sales-based royalty payments from the remaining performance obligations. Approximately 50% of the contracted but unsatisfied or partially unsatisfied performance obligations as of July 31, 2021, excluding non-cancellable FSA, are expected to be recognized over the next 12 months, with the remainder recognized thereafter.

During the three and nine months ended July 31, 2021, the Company recognized $27.9 million and $88.7 million, respectively, from performance obligations satisfied from sales-based royalties earned during the periods. During the three and nine months ended July 31, 2020, the Company recognized $25.9 million and $78.0 million, respectively, from performance obligations satisfied from sales-based royalties earned during the periods.

Costs of Obtaining a Contract with Customer

The incremental costs of obtaining a contract with a customer, which consist primarily of direct sales commissions earned upon execution of the contract, are required to be capitalized under ASC 340-40 and amortized over the estimated period of which the benefit is expected to be received. As direct sales commissions paid for renewals are commensurate with the amounts paid for initial contracts, the deferred incremental costs will be recognized over the contract term. Total capitalized direct commission costs as of July 31, 2021 were $83.9 million and included in other assets in the Company's unaudited condensed consolidated balance sheets. Amortization was $16.5 million and $47.0 million during the three and nine months ended July 31, 2021, respectively, and included in sales and marketing expense in the Company's unaudited condensed consolidated statements of operations. Amortization was $16.6 million and $44.9 million during the three and nine months ended July 31, 2020, respectively, and included in sales and marketing expense in the Company's unaudited condensed consolidated statements of operations.

Note 4. Business Combinations

During the nine months ended July 31, 2021, the Company completed several acquisitions for an aggregate consideration of $166.9 million, net of cash acquired. The Company does not consider these acquisitions to be material, individually or in the aggregate, to the Company's unaudited condensed consolidated statements of operations. The preliminary purchase allocations are $57.7 million of identifiable intangible assets and $114.6 million in goodwill, of which $68.9 million is attributable to the Semiconductor & System Design reporting segment and $45.7 million is attributable to the Software Integrity reporting segment. The fair value of these intangible assets and goodwill are estimated using the income method.

The preliminary fair value estimates for the assets acquired and liabilities assumed for all acquisitions completed within 12 months from the applicable acquisition date are not yet finalized and may change as additional information becomes available during the respective measurement periods. The primary areas of those preliminary estimates relate to certain tangible assets and liabilities, identifiable intangible assets, and income taxes.

Note 5. Goodwill and Intangible Assets

Goodwill

The changes in the carrying amount of goodwill during the nine months ended July 31, 2021 were as follows:

	(in thousands)
Balance at October 31, 2020	$ 3,365,114
Additions	114,628
Effect of foreign currency translation	5,439
Balance at July 31, 2021	$ 3,485,181

Intangible Assets

Intangible assets as of July 31, 2021 consisted of the following:

	Gross Assets	Accumulated Amortization	Net Assets
		(in thousands)	
Core/developed technology	$ 884,603	$ 736,125	$ 148,478
Customer relationships	381,703	300,441	81,262
Contract rights intangible	192,359	187,909	4,450
Trademarks and trade names	43,095	30,545	12,550
Capitalized software development costs	45,639	42,405	3,234
Total	$ 1,547,399	$ 1,297,425	$ 249,974

Intangible assets as of October 31, 2020 consisted of the following:

	Gross Assets	Accumulated Amortization	Net Assets
		(in thousands)	
Core/developed technology	$ 827,232	$ 703,009	$ 124,223
Customer relationships	380,838	277,219	103,619
Contract rights intangible	192,812	186,763	6,049
Trademarks and trade names	43,096	28,716	14,380
In-process research and development (IPR&D)	1,214	—	1,214
Capitalized software development costs	44,122	39,285	4,837
Total	$ 1,489,314	$ 1,234,992	$ 254,322

Amortization expense related to intangible assets consisted of the following:

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2021	2020	2021	2020
	(in thousands)			
Core/developed technology	$ 11,431	$ 12,472	$ 33,416	$ 37,515
Customer relationships	7,960	8,971	23,443	26,444
Contract rights intangible	439	1,272	1,748	3,829
Trademarks and trade names	610	934	1,830	2,489
Capitalized software development costs[1]	1,010	947	3,120	2,782
Total	$ 21,450	$ 24,596	$ 63,557	$ 73,059

[1] Amortization of capitalized software development costs is included in cost of products revenue in the unaudited condensed consolidated statements of operations.

The following table presents the estimated future amortization of intangible assets as of July 31, 2021:

Fiscal year	(in thousands)
Remainder of fiscal 2021	$ 21,104
2022	73,594
2023	56,625
2024	46,005
2025	29,903
2026 and thereafter	22,743
Total	$ 249,974

Note 6. Financial Assets and Liabilities

Cash equivalents. The Company classifies time deposits and other investments with stated maturities less than three months as cash equivalents.

Short-term investments. Debt securities and other investments with stated maturities longer than three months are classified as short-term investments and the Company may convert these investments into cash at any time to fund general operations. These debt securities and other investments generally have an effective maturity term of less than three years and are classified as available-for-sale carried at fair value, with unrealized gains and losses included in the unaudited condensed consolidated balance sheets as a component of accumulated other comprehensive income (loss). Gross unrealized gains and losses on our available-for-sale debt securities at July 31, 2021 were not significant. For available-for-sale debt securities in an unrealized loss position, the Company evaluates whether a credit loss exists based on available information relevant to the credit rating of the security. The allowance for credit loss is recorded to other income (expense), net, on the condensed consolidated statement of operations, not to exceed the amount of the unrealized loss. Any excess unrealized loss other than the credit loss is recognized in accumulated other comprehensive income or loss in the stockholders' equity section of the condensed consolidated balance sheets. The Company determined there were no credit losses related to available-for-sale securities as of July 31, 2021. The cost of securities sold is based on the specific identification method and realized gains and losses are included in other income (expense), net.

As of July 31, 2021, the stated maturities of the Company's short-term available-for-sale securities were:

	Amortized Cost	Fair Value
	(in thousands)	
less than 1 year	$ 38,178	$ 38,169
1-5 years	99,133	99,154
> 5 years	7,447	7,450
Total	$ 144,758	$ 144,773

As of July 31, 2021, the balances of the Company's cash equivalents and short-term investments were:

	Cost	Gross Unrealized Gains	Gross Unrealized Losses Less Than 12 Continuous Months	Gross Unrealized Losses 12 Continuous Months or Longer	Estimated Fair Value[1]
			(in thousands)		
Cash equivalents:					
Money market funds	$ 249,814	$ —	$ —	$ —	$ 249,814
Corporate debt securities	3,080	—	(1)	—	3,079
Total:	$ 252,894	$ —	$ (1)	$ —	$ 252,893
Short-term investments:					
U.S. government agency & T-bills	$ 7,745	$ 2	$ —	$ —	$ 7,747
Municipal bonds	2,465	1	—	—	2,466
Corporate debt securities	100,308	38	(28)	—	100,318
Asset-backed securities	33,502	10	(7)	—	33,505
Others	738	—	(1)	—	737
Total:	$ 144,758	$ 51	$ (36)	$ —	$ 144,773

[1] See Note 7. Fair Value Measures for further discussion on fair values of cash equivalents and short-term investments.

As of October 31, 2020, the balances of the Company's cash equivalents were:

	Cost	Gross Unrealized Gains	Gross Unrealized Losses Less Than 12 Continuous Months	Gross Unrealized Losses 12 Continuous Months or Longer	Estimated Fair Value[1]
			(in thousands)		
Cash equivalents:					
Money market funds	$ 304,127	$ —	$ —	$ —	$ 304,127
Total:	$ 304,127	$ —	$ —	$ —	$ 304,127

[1] See Note 7. Fair Value Measures for further discussion on fair values of cash equivalents.

Restricted cash. The Company includes amounts generally described as restricted cash and restricted cash equivalents in cash and cash equivalents when reconciling beginning-of-period and end-of-period total amounts shown on the consolidated statements of cash flows. All restricted cash is primarily associated with office leases.

The following table provides a reconciliation of cash, cash equivalents and restricted cash included in the unaudited condensed consolidated balance sheets:

	As of	
	July 31, 2021	October 31, 2020
	(in thousands)	
Cash and cash equivalents	$ 1,385,395	$ 1,235,653
Restricted cash included in Prepaid expenses and other current assets	1,556	1,523
Restricted cash included in Other long-term assets	786	794
Total cash, cash equivalents and restricted cash	$ 1,387,737	$ 1,237,970

Non-marketable equity securities. The Company's strategic investment portfolio consists of non-marketable equity securities in privately held companies. When the Company does not have the ability to exercise significant influence over the investments, these securities are accounted for using the measurement alternative when the fair value of the investment is not readily determinable. Securities accounted for as equity method investments are recorded at cost plus the proportional share of the issuers' income or loss, which is recorded in the Company's other income (expense), net. The cost basis of securities sold is based on the specific identification method. See *Note 7. Fair Value Measures*.

Derivatives

The Company recognizes derivative instruments as either assets or liabilities in the unaudited condensed consolidated balance sheets at fair value and provides qualitative and quantitative disclosures about such derivatives. The Company operates internationally and is exposed to potentially adverse movements in foreign currency exchange rates. The Company enters into hedges in the form of foreign currency forward contracts to reduce its exposure to foreign currency rate changes on non-functional currency denominated forecasted transactions and balance sheet positions including: (1) certain assets and liabilities, (2) shipments forecasted to occur within approximately one month, (3) future billings and revenue on previously shipped orders, and (4) certain future intercompany invoices denominated in foreign currencies.

The duration of forward contracts ranges from approximately one month to 23 months, the majority of which are short-term. The Company does not use foreign currency forward contracts for speculative or trading purposes. The Company enters into foreign exchange forward contracts with high credit quality financial institutions that are rated ‘A’ or above and to date has not experienced nonperformance by counterparties. In addition, the Company mitigates credit risk in derivative transactions by permitting net settlement of transactions with the same counterparty and anticipates continued performance by all counterparties to such agreements.

The assets or liabilities associated with the forward contracts are recorded at fair value in other current assets or accrued liabilities in the unaudited condensed consolidated balance sheets. The accounting for gains and losses resulting from changes in fair value depends on the use of the foreign currency forward contract and whether it is designated and qualifies for hedge accounting. The cash flow impact upon settlement of the derivative contracts will be included in “Net cash provided by operating activities” in the unaudited condensed consolidated statements of cash flows.

Cash Flow Hedging Activities

Certain foreign exchange forward contracts are designated and qualify as cash flow hedges. These contracts have durations of approximately 23 months or less. Certain forward contracts are rolled over periodically to capture the full length of exposure to the Company’s foreign currency risk, which can be up to three years. To receive hedge accounting treatment, all hedging relationships are formally documented at the inception of the hedge, and the hedges must be highly effective in offsetting changes to future cash flows on the hedged transactions. The related gains or losses resulting from changes in fair value of these hedges is initially reported, net of tax, as a component of other comprehensive income (loss) (OCI) in stockholders’ equity and reclassified into revenue or operating expenses, as appropriate, at the time the hedged transactions affect earnings. The Company expects a majority of the hedge balance in OCI to be reclassified to the statements of operations within the next 12 months.

The Company did not have any gains or losses related to discontinuation of cash flow hedges during the three and nine months ended July 31, 2021 and 2020.

Non-designated Hedging Activities

The Company’s foreign exchange forward contracts that are used to hedge non-functional currency denominated balance sheet assets and liabilities are not designated as hedging instruments. Accordingly, any gains or losses from changes in the fair value of the forward contracts are recorded in other income (expense), net. The gains and losses on these forward contracts generally offset the gains and losses associated with the underlying assets and liabilities, which are also recorded in other income (expense), net. The duration of the forward contracts for hedging the Company’s balance sheet exposure is approximately one month.

The Company also has certain foreign exchange forward contracts for hedging certain international revenues and expenses that are not designated as hedging instruments. Accordingly, any gains or losses from changes in the fair value of the forward contracts are recorded in other income (expense), net. The gains and losses on these forward contracts generally offset the gains and losses associated with the foreign currency in operating income. The duration of these forward contracts is usually less than one year. The overall goal of the Company’s hedging program is to minimize the impact of currency fluctuations on its net income over its fiscal year.

The effects of the non-designated derivative instruments on the Company's unaudited condensed consolidated statements of operations is summarized as follows:

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2021	2020	2021	2020
	(in thousands)			
Gain (loss) recorded in other income (expense), net	$ (837)	$ 2,995	$ 1,420	$ 1,891

The notional amounts in the table below for derivative instruments provide one measure of the transaction volume outstanding:

	As of	
	July 31, 2021	October 31, 2020
	(in thousands)	
Total gross notional amount	$ 826,747	$ 981,234
Net fair value	$ 11,346	$ 6,940

The Company's exposure to market gain or loss will vary over time as a function of currency exchange rates. The amounts ultimately realized upon settlement of these financial instruments, together with the gains and losses on the underlying exposures, will depend on actual market conditions during the remaining life of the instruments.

The following table represents the unaudited condensed consolidated balance sheets location and amount of derivative instrument fair values segregated between designated and non-designated hedge instruments:

	Fair values of derivative instruments designated as hedging instruments	Fair values of derivative instruments not designated as hedging instruments
	(in thousands)	
Balance at July 31, 2021		
Other current assets	$ 11,060	$ 598
Accrued liabilities	$ 237	$ 75
Balance at October 31, 2020		
Other current assets	$ 9,182	$ 138
Accrued liabilities	$ 2,088	$ 292

The following table represents the location of the amount of gains and losses on derivative instrument fair values for designated hedge instruments, net of tax in the unaudited condensed consolidated statements of operations:

	Location of gain (loss) recognized in OCI on derivatives	Amount of gain (loss) recognized in OCI on derivatives (effective portion)	Location of gain (loss) reclassified from OCI	Amount of gain (loss) reclassified from OCI (effective portion)
		(in thousands)		
Three months ended July 31, 2021				
Foreign exchange contracts	Revenue	$ 251	Revenue	$ 1,563
Foreign exchange contracts	Operating expenses	3,413	Operating expenses	3,267
Total		$ 3,664		$ 4,830
Three months ended July 31, 2020				
Foreign exchange contracts	Revenue	$ 626	Revenue	$ 466
Foreign exchange contracts	Operating expenses	11,773	Operating expenses	(1,175)
Total		$ 12,399		$ (709)
Nine months ended July 31, 2021				
Foreign exchange contracts	Revenue	$ 1,892	Revenue	$ 2,597
Foreign exchange contracts	Operating expenses	7,079	Operating expenses	9,583
Total		$ 8,971		$ 12,180
Nine months ended July 31, 2020				
Foreign exchange contracts	Revenue	$ 2,836	Revenue	$ 648
Foreign exchange contracts	Operating expenses	1,129	Operating expenses	(2,211)
Total		$ 3,965		$ (1,563)

Note 7. Fair Value Measures

Accounting Standards Codification (ASC) 820-10, *Fair Value Measurements and Disclosures*, defines fair value, establishes guidelines and enhances disclosure requirements for fair value measurements. The accounting guidance requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value. The accounting guidance also establishes a fair value hierarchy based on the independence of the source and objective evidence of the inputs used. There are three fair value hierarchies based upon the level of inputs that are significant to fair value measurement:

Level 1—Observable inputs that reflect quoted prices (unadjusted) for identical instruments in active markets;

Level 2—Observable inputs other than quoted prices included in Level 1 for similar instruments in active markets, quoted prices for identical or similar instruments in markets that are not active, and model-driven valuations in which all significant inputs and significant value drivers are observable in active markets; and

Level 3—Unobservable inputs to the valuation derived from fair valuation techniques in which one or more significant inputs or significant value drivers are unobservable.

On a recurring basis, the Company measures the fair value of certain of its assets and liabilities, which include cash equivalents, non-qualified deferred compensation plan assets, and foreign currency derivative contracts.

The Company's cash equivalents and short-term investments are classified within Level 1 or Level 2 because they are valued using quoted market prices in an active market or alternative independent pricing sources and models utilizing market observable inputs.

The Company's non-qualified deferred compensation plan assets consist of money market and mutual funds invested in domestic and international marketable securities that are directly observable in active markets and are therefore classified within Level 1.

The Company’s foreign currency derivative contracts are classified within Level 2 because these contracts are not actively traded and the valuation inputs are based on quoted prices and market observable data of similar instruments.

The Company’s borrowings under its credit and term loan facilities are classified within Level 2 because these borrowings are not actively traded and have a variable interest rate structure based upon market rates currently available to the Company for debt with similar terms and maturities. See Note 9. Credit and Term Loan Facilities for more information on these borrowings.

Assets/Liabilities Measured at Fair Value on a Recurring Basis

Assets and liabilities measured at fair value on a recurring basis are summarized below as of July 31, 2021:

		Fair Value Measurement Using		
Description	Total	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
		(in thousands)		
Assets				
Cash equivalents:				
Money market funds	$ 249,814	249,814	$ —	$ —
Corporate debt securities	3,079		3,079	—
Short-term investments:				
U.S. government agency & T-bills	7,747		7,747	—
Municipal bonds	2,466		2,466	—
Corporate debt securities	100,318		100,318	—
Asset-backed securities	33,505		33,505	—
Others	737		737	—
Prepaid and other current assets:				
Foreign currency derivative contracts	11,657		11,657	—
Other long-term assets:				
Deferred compensation plan assets	335,630	335,630	—	—
Total assets	$ 744,953	$ 585,444	$ 159,509	$ —
Liabilities				
Accounts payable and accrued liabilities:				
Foreign currency derivative contracts	$ 313	$ —	$ 313	$ —
Other long-term liabilities:				
Deferred compensation plan liabilities	336,001	336,001	—	—
Total liabilities	$ 336,314	$ 336,001	$ 313	$ —

Assets and liabilities measured at fair value on a recurring basis are summarized below as of October 31, 2020:

		Fair Value Measurement Using		
Description	Total	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
		(in thousands)		
Assets				
Cash equivalents:				
Money market funds	$ 304,127	$ 304,127	$ —	$ —
Prepaid and other current assets:				
Foreign currency derivative contracts	9,320	—	9,320	—
Other long-term assets:				
Deferred compensation plan assets	269,737	269,737	—	—
Total assets	$ 583,184	$ 573,864	$ 9,320	$ —
Liabilities				
Accounts payable and accrued liabilities:				
Foreign currency derivative contracts	$ 2,380	$ —	$ 2,380	$ —
Other long-term liabilities:				
Deferred compensation plan liabilities	269,737	269,737	—	—
Total liabilities	$ 272,117	$ 269,737	$ 2,380	$ —

Assets/Liabilities Measured at Fair Value on a Non-Recurring Basis

Non-Marketable Equity Securities

Equity investments in privately-held companies, also called non-marketable equity securities, are accounted for using either the measurement alternative method or equity method of accounting.

Non-marketable equity securities accounted for under the measurement alternative method are recorded at fair value and are adjusted for subsequent observable changes in fair value. Non-marketable equity securities accounted for under the equity method of accounting are recorded at cost plus the proportional share of the issuers' income or loss. These equity investments are classified within Level 3 as they are valued using significant unobservable inputs or data in an inactive market, and the valuation requires management judgment due to the absence of market price and inherent lack of liquidity. The Company monitors these investments and generally uses the income approach to assess impairments based primarily on the financial conditions of these companies.

Note 8. Liabilities and Restructuring Charges

In the third quarter of fiscal 2021, the Company initiated a restructuring plan for involuntary and voluntary employee termination and facility closure actions as part of a business reorganization. The total charges under the 2021 restructuring plan (the 2021 Plan) are expected to be in the range of $42 million to $53 million and will consist primarily of severance, termination, and retirement benefits under the 2021 Voluntary Retirement Program (VRP). The 2021 Plan and VRP are expected to be completed in the first quarter of fiscal 2022.

During the three and nine months ended July 31, 2021, the Company recorded restructuring charges of $15.1 million and made payments of $8.3 million under the 2021 Plan. These charges consisted primarily of severance and termination costs. As of July 31, 2021, $6.8 million of payroll and related benefits liabilities remained outstanding and was recorded in accounts payable and accrued liabilities in the unaudited condensed consolidated balance sheets.

Accounts payable and accrued liabilities consist of:

	As of	
	July 31, 2021	October 31, 2020
	(in thousands)	
Payroll and related benefits	$ 486,322	$ 492,626
Other accrued liabilities	88,110	101,035
Accounts payable	41,305	30,003
Total	$ 615,737	$ 623,664

Other long-term liabilities consist of:

	As of	
	July 31, 2021	October 31, 2020
	(in thousands)	
Deferred compensation liability	$ 336,001	$ 269,737
Other long-term liabilities	19,446	14,774
Total	$ 355,447	$ 284,511

Note 9. Credit and Term Loan Facilities

On January 22, 2021, the Company entered into a Fourth Extension and Amendment Agreement (the "Fourth Amendment"), which amends and restates the Company's previous credit agreement, dated as of November 28, 2016 (as amended and restated, the "Credit Agreement"). The Company's outstanding borrowings under the previous credit agreement, which as of January 22, 2021 consisted of term loans in the aggregate principal amount of $97.5 million, are carried over under the Credit Agreement.

The Fourth Amendment extends the termination date of the existing $650 million senior unsecured revolving credit facility from November 28, 2021 to January 22, 2024, which may be further extended at the Company's option. The outstanding term loans under the Credit Agreement will continue to amortize in quarterly installments with the balance due at maturity on November 28, 2021. The Credit Agreement also provides an uncommitted incremental loan facility of up to $150 million in the aggregate principal amount. The Credit Agreement contains financial covenants requiring the Company to maintain a maximum consolidated leverage ratio and a minimum consolidated interest coverage ratio, as well as other non-financial covenants. As of July 31, 2021, the Company was in compliance with all financial covenants.

As of July 31, 2021, the Company had $82.5 million outstanding balance, net of debt issuance costs, under the Term Loan. Outstanding principal payments under the Term Loan are due as follows:

Fiscal year	(in thousands)
Remainder of fiscal 2021	$ 7,500
2022	75,000
Total	$ 82,500

As of October 31, 2020, the Company had $102.1 million outstanding balance, net of debt issuance costs, under the Term Loan, of which $75.0 million was classified as long-term liabilities.

There was no outstanding balance under the Revolver as of July 31, 2021 and October 31, 2020. The Company expects its borrowings under the Revolver will fluctuate from quarter to quarter. Borrowings bear interest at a floating rate based on a margin over the Company's choice of market observable base rates as defined in the Credit Agreement. As of July 31, 2021, borrowings under the Term Loan bore interest at LIBOR +1.125% and the applicable interest rate for the Revolver was LIBOR +1.000%. In addition, commitment fees are payable on the Revolver at rates between 0.125% and 0.200% per year based on the Company's leverage ratio on the daily amount of the revolving commitment.

In July 2018, the Company entered into a 12-year 220.0 million RMB (approximately $33.0 million) credit agreement with a lender in China to support its facilities expansion. Borrowings bear interest at a floating rate based on the 5 year Loan Prime Rate plus 0.74%. As of July 31, 2021, the Company had $24.8 million outstanding under the agreement.

The carrying amount of the short-term and long-term debt approximates the estimated fair value. These borrowings under the Credit Agreement have a variable interest rate structure and are classified within Level 2 of the fair value hierarchy.

Note 10. Leases

The Company has operating lease arrangements for office space, data center, equipment and other corporate assets. These leases have various expiration dates through December 31, 2040, some of which include options to extend the leases for up to 10 years. Because the Company is not reasonably certain to exercise these renewal options, the options are not considered in determining the lease term and associated potential option payments are excluded from lease payments.

The components of the Company's lease expense during the period presented are as follows:

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2021	2020	2021	2020
	(in thousands)			
Operating lease expense [1]	$ 23,843	$ 23,450	$ 70,818	$ 69,932
Variable lease expense [2]	2,184	1,447	5,361	3,439
Total lease expense	$ 26,027	$ 24,897	$ 76,179	$ 73,371

[1] Operating lease expense includes immaterial amounts of short-term leases, net of sublease income.

[2] Variable lease expense includes payments to lessors that are not fixed or determinable at lease commencement date. These payments primarily consist of maintenance, property taxes, insurance and variable indexed based payments.

Supplemental cash flow information during the period presented is as follows:

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2021	2020	2021	2020
	(in thousands)			
Cash paid for amounts included in the measurement of operating lease liabilities	$ 21,913	$ 18,637	$ 64,516	$ 52,766
ROU assets obtained in exchange for operating lease liabilities	$ 10,742	$ 27,063	$ 92,149	$ 56,846

Lease term and discount rate information related to the Company's operating leases as of the end of the period presented are as follows:

	July 31, 2021	October 31, 2020
Weighted-average remaining lease term (in years)	8.11	8.62
Weighted-average discount rate	2.39 %	2.56 %

The following represents the maturities of the Company's future lease payments due under operating leases as of July 31, 2021:

Fiscal year	Lease Payments (in thousands)
Remainder of fiscal 2021	$ 20,538
2022	94,494
2023	79,441
2024	73,292
2025	63,800
Thereafter	296,021
Total future minimum lease payments	627,586
Less: Imputed interest	60,723
Total lease liabilities	$ 566,863

As of July 31, 2021, the Company has additional operating leases that have not yet commenced with future undiscounted lease payments of $1.9 million. These operating leases may commence in August 2021, with lease terms between 3 years and 5 years.

In addition, certain facilities owned by the Company were leased to third parties under non-cancellable operating lease agreements. These leases have annual escalating payments and have expiration dates through March 31, 2031 in accordance with the terms and conditions of the existing agreement. The lease receipts including sublease income for leased and owned facilities due to the Company as of July 31, 2021 are as follows:

Fiscal year	Lease Receipts (in thousands)
Remainder of fiscal 2021	$ 3,882
2022	15,609
2023	14,912
2024	12,593
2025	6,375
Thereafter	38,032
Total	$ 91,403

Note 11. Accumulated Other Comprehensive Income (Loss)

Components of accumulated other comprehensive income (loss), on an after-tax basis where applicable, were as follows:

	As of	
	July 31, 2021	October 31, 2020
	(in thousands)	
Cumulative currency translation adjustments	$ (48,606)	$ (57,463)
Unrealized gain (loss) on derivative instruments, net of taxes	180	3,389
Unrealized gain (loss) on available-for-sale securities, net of taxes	15	—
Total accumulated other comprehensive income (loss)	$ (48,411)	$ (54,074)

The effect of amounts reclassified out of each component of accumulated other comprehensive income (loss) into net income was as follows:

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2021	2020	2021	2020
	(in thousands)			
Reclassifications from accumulated other comprehensive income (loss) into unaudited condensed consolidated statements of operations:				
Gain (loss) on cash flow hedges, net of taxes				
Revenues	$ 1,563	$ 466	$ 2,597	$ 648
Operating expenses	3,267	(1,175)	9,583	(2,211)
Total reclassifications into net income	$ 4,830	$ (709)	$ 12,180	$ (1,563)

Note 12. Stock Repurchase Program

The Company's Board of Directors (the Board) previously approved a stock repurchase program pursuant to which the Company was authorized to purchase up to $500.0 million of its common stock and has periodically replenished the stock repurchase program to such amount. The Board approved a replenishment of the stock repurchase program to $500.0 million on June 17, 2021. As of July 31, 2021, $325.0 million remained available for future repurchases under the program.

In June 2021, the Company entered into an accelerated share repurchase agreement (the June 2021 ASR) to repurchase an aggregate of $175.0 million of the Company's common stock. Pursuant to the June 2021 ASR, the Company made a prepayment of $175.0 million to receive initial deliveries of shares valued at $140.0 million. The remaining balance of $35.0 million was settled in August 2021. Total shares purchased under the June 2021 ASR were approximately 0.6 million shares, at an average purchase price of $282.13 per share.

Stock repurchase activities as well as the reissuance of treasury stock for employee stock-based compensation purposes are as follows:

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2021[(1)]	2020[(2)]	2021[(1)]	2020[(2)]
	(in thousands)			
Total shares repurchased	521	149	2,114	1,380
Total cost of the repurchased shares	$ 140,000	$ 20,000	$ 538,082	$ 200,000
Reissuance of treasury stock	564	999	2,093	2,807

[(1)] Does not include the 99,573 shares and $35.0 million equity forward contract from the June 2021 ASR.

[(2)] The third quarter of fiscal 2020 includes the settlement of the 148,953 shares and $20.0 million equity forward contract from the February 2020 ASR settled in May 2020.

Note 13. Stock-Based Compensation

The compensation cost recognized in the unaudited condensed consolidated statements of operations for the Company's stock compensation arrangements was as follows:

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2021	2020	2021	2020
	(in thousands)			
Cost of products	$ 9,582	$ 6,478	$ 28,238	$ 18,174
Cost of maintenance and service	3,446	1,959	10,192	6,109
Research and development expense	42,430	31,367	124,231	86,469
Sales and marketing expense	15,330	10,863	45,040	29,483
General and administrative expense	14,374	11,170	40,829	29,920
Stock-based compensation expense before taxes	85,162	61,837	248,530	170,155
Income tax benefit	(13,277)	(10,562)	(38,746)	(29,062)
Stock-based compensation expense after taxes	$ 71,885	$ 51,275	$ 209,784	$ 141,093

As of July 31, 2021, the Company had $594.9 million of total unrecognized stock-based compensation expense relating to options and restricted stock units and awards, which is expected to be recognized over a weighted-average period of 2.3 years. As of July 31, 2021, the Company had $35.3 million of unrecognized stock-based compensation expense relating to its Employee Stock Purchase Plan (ESPP), which is expected to be recognized over a period of approximately 2.0 years.

The intrinsic values of equity awards exercised during the periods are as follows:

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2021	2020	2021	2020
	(in thousands)			
Intrinsic value of awards exercised	$ 30,896	$ 50,087	$ 143,100	$ 152,397

Note 14. Net Income Per Share

The Company computes basic net income per share by dividing net income available to common stockholders by the weighted average number of common shares outstanding during the period. Diluted net income per share reflects the dilution from potential common shares outstanding such as stock options and unvested restricted stock units and awards during the period using the treasury stock method.

The table below reconciles the weighted average common shares used to calculate basic net income per share with the weighted average common shares used to calculate diluted net income per share:

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2021	2020	2021	2020
	(in thousands, except per share amounts)			
Numerator:				
Net income attributed to Synopsys	$ 198,646	$ 252,911	$ 556,069	$ 466,892
Denominator:				
Weighted average common shares for basic net income per share	152,635	151,352	152,619	150,731
Dilutive effect of common share equivalents from equity-based compensation	4,272	4,621	4,539	4,343
Weighted average common shares for diluted net income per share	156,907	155,973	157,158	155,074
Net income per share attributed to Synopsys:				
Basic	$ 1.30	$ 1.67	$ 3.64	$ 3.10
Diluted	$ 1.27	$ 1.62	$ 3.54	$ 3.01
Anti-dilutive employee stock-based awards excluded[(1)]	355	3	405	610

(1) These stock options and unvested restricted stock units were anti-dilutive for the respective periods and are excluded in calculating diluted net income per share. While such awards were anti-dilutive for the respective periods, they could be dilutive in the future.

Note 15. Segment Disclosure

Segment reporting is based upon the “management approach,” i.e., how management organizes the Company’s operating segments for which separate financial information is (1) available and (2) evaluated regularly by the Chief Operating Decision Makers (CODMs) in deciding how to allocate resources and in assessing performance. The Company’s CODMs are its two Co-Chief Executive Officers.

The Company has two reportable segments: (1) Semiconductor & System Design, which includes EDA tools, IP products, system integration solutions and other associated revenue categories, and (2) Software Integrity, which includes a comprehensive solution for building integrity—security, quality and compliance testing—into the customers’ software development lifecycle and supply chain.

The financial information provided to and used by the CODMs to assist in making operational decisions, allocating resources, and assessing performance reflects consolidated financial information as well as revenue, adjusted operating income, and adjusted operating margin information for the Semiconductor & System Design and Software Integrity segments, accompanied by disaggregated information relating to revenue by geographic region.

Information by reportable segment was as follows:

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2021	2020	2021	2020
	(in thousands)			
Total Segments:				
Revenue	$ 1,057,130	$ 964,134	$ 3,051,774	$ 2,659,842
Adjusted operating income	337,396	323,553	941,456	731,890
Adjusted operating margin	32 %	34 %	31 %	28 %
Semiconductor & System Design:				
Revenue	$ 959,155	$ 870,734	$ 2,767,950	$ 2,392,542
Adjusted operating income	328,742	308,730	916,434	697,273
Adjusted operating margin	34 %	35 %	33 %	29 %
Software Integrity:				
Revenue	$ 97,975	$ 93,400	$ 283,824	$ 267,300
Adjusted operating income	8,654	14,823	25,022	34,617
Adjusted operating margin	9 %	16 %	9 %	13 %

Certain operating expenses are not allocated to the segments and are managed at a consolidated level. The unallocated expenses managed at a consolidated level, including amortization of intangible assets, stock-based compensation and certain other operating expenses, are presented in the table below to provide a reconciliation of the total adjusted operating income from segments to the Company's consolidated operating income:

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2021	2020	2021	2020
	(in thousands)			
Total segment adjusted operating income	$ 337,396	$ 323,553	$ 941,456	$ 731,890
Reconciling items:				
Amortization of intangible expense	(20,440)	(23,649)	(60,437)	(70,277)
Stock-based compensation expense	(85,162)	(61,837)	(248,530)	(170,155)
Other	(29,871)	(27,469)	(87,987)	(67,449)
Total operating income	$ 201,923	$ 210,598	$ 544,502	$ 424,009

The CODMs do not use total assets by segment to evaluate segment performance or allocate resources. As a result, total assets by segment are not required to be disclosed.

In allocating revenue to particular geographic areas, the CODMs consider where individual "seats" or licenses to the Company's products are located. Revenue is defined as revenue from external customers. Revenue related to operations in the United States and other geographic areas were:

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2021	2020	2021	2020
	(in thousands)			
Revenue:				
United States	$ 477,218	$ 432,692	$ 1,417,636	$ 1,245,570
Europe	112,877	94,297	324,212	277,951
China	164,172	160,230	405,460	308,663
Korea	110,536	96,344	314,178	291,175
Other	192,327	180,571	590,288	536,483
Consolidated	$ 1,057,130	$ 964,134	$ 3,051,774	$ 2,659,842

Geographic revenue data for multi-regional, multi-product transactions reflect internal allocations and are therefore subject to certain assumptions and to the Company's methodology.

Note 16. Other Income (Expense), Net

The following table presents the components of other income (expense), net:

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2021	2020	2021	2020
	(in thousands)			
Interest income	$ 657	$ 780	$ 1,413	$ 3,137
Interest expense	(757)	(941)	(2,301)	(4,390)
Gain (loss) on assets related to deferred compensation plan	10,473	26,153	62,697	20,166
Foreign currency exchange gain (loss)	2,756	123	5,283	5,255
Other, net	(1,715)	141	(5,158)	(1,584)
Total	$ 11,414	$ 26,256	$ 61,934	$ 22,584

Note 17. Income Taxes

Effective Tax Rate

The Company estimates its annual effective tax rate at the end of each fiscal quarter. The effective tax rate takes into account the Company's estimations of annual pre-tax income, the geographic mix of pre-tax income and interpretations of tax laws and possible outcomes of audits.

The following table presents the provision (benefit) for income taxes and the effective tax rates:

	Three Months Ended July 31,		Nine Months Ended July 31,	
	2021	2020	2021	2020
	(in thousands)			
Income before income taxes	$ 213,337	$ 236,854	$ 606,436	$ 446,593
Provision (benefit) for income taxes	$ 14,945	$ (16,057)	$ 51,214	$ (20,299)
Effective tax rate	7.0 %	(6.8)%	8.4 %	(4.5)%

The Company's effective tax rate for the nine months ended July 31, 2021 is lower than the statutory federal corporate tax rate of 21.0% primarily due to U.S. federal research tax credits, foreign-derived intangible income deduction, excess tax benefits from stock-based compensation, and U.S. foreign tax credits, partially offset by state taxes, the effect of non-deductible stock-based compensation, and higher taxes on certain foreign earnings.

The Company's effective tax rate increased in the three and nine months ended July 31, 2021 as compared to the same periods in fiscal 2020, primarily due to enacted legislation in California which limits the use of California research and development tax credits commencing in fiscal 2021 and the federal taxation of foreign earnings offset by deemed paid foreign tax credits during the three months ended July 31, 2020. The Company's effective tax rate also increased in the nine months ended July 31, 2021 as compared to the same period in fiscal 2020 primarily due to the realizability of U.S. foreign tax credits in the nine months ended July 31, 2020.

The timing of the resolution of income tax examinations, and the amounts and timing of various tax payments that are part of the settlement process, are highly uncertain. Variations in such amounts and/or timing could cause large fluctuations in the balance sheet classification of current and non-current assets and liabilities. The Company believes that in the coming 12 months, it is reasonably possible that either certain audits and ongoing tax litigation will conclude or the statute of limitations on certain state and foreign income and withholding taxes will expire, or both. Given the uncertainty as to ultimate settlement terms, the timing of payment and the impact of such settlements on other uncertain tax positions, the range of the estimated potential decrease in underlying unrecognized tax benefits is between $0 and $48 million.

U.S. Examinations

In the third quarter of fiscal 2020, the Company reached a final settlement with the California Franchise Tax Board for fiscal years 2015 through 2017 and recognized $19.2 million in previously unrecognized tax benefits. In the third quarter of fiscal 2021, there were no material audit settlements.

Non-U.S. Examinations

Hungarian Tax Authority

In July 2017, the Hungarian Tax Authority (the HTA) issued a final assessment against the Company's Hungarian subsidiary (Synopsys Hungary) for fiscal years 2011 through 2013. The HTA has applied withholding taxes on certain payments made to affiliates, resulting in an aggregate tax assessment of approximately $25.0 million and interest and penalties of $11.0 million. On August 2, 2017, Synopsys Hungary filed a claim contesting the final assessment with the Hungarian Administrative Court (the Administrative Court). In the first quarter of fiscal 2018, Synopsys Hungary paid the assessments, penalties and interest as required by law and recorded these amounts as prepaid taxes on its balance sheet, while continuing its challenge to the assessment in court. On April 30, 2019, the Administrative Court ruled against Synopsys Hungary. The Administrative Court's opinion was received on May 16, 2019 and Synopsys Hungary filed an appeal with the Hungarian Supreme Court on July 5, 2019. In the second quarter of 2019, as a result of the Court's decision, the Company recorded a tax expense due to an unrecognized tax benefit of $17.4 million, which is net of estimated U.S. foreign tax credits for the tax assessments. The Hungarian Supreme Court heard the Company's appeal on November 12, 2020 and remanded the case to the Administrative Court for further proceedings. The Company received the Hungarian Supreme Court's written decision in the first quarter of fiscal 2021. On April 27, 2021, the Administrative Court reheard the case and again ruled against Synopsys Hungary. The Company received the written opinion from the Administrative Court on May 19, 2021. Synopsys Hungary filed an appeal with the Hungarian Supreme Court on July 19, 2021.

In the second quarter of fiscal 2020, the Company reached a final settlement with the HTA for fiscal years 2014 through 2018 and recognized a net $6.9 million in previously unrecognized tax benefits.

The Company is also under examination by the tax authorities in certain other jurisdictions. No material assessments have been proposed in these examinations.

Note 18. Contingencies

Legal Proceedings

The Company is subject to routine legal proceedings, as well as demands, claims and threatened litigation that arise in the normal course of its business. The ultimate outcome of any litigation is often uncertain and unfavorable outcomes could have a negative impact on the Company's results of operations and financial condition. The Company regularly reviews the status of each significant matter and assesses its potential financial exposure. If the potential loss from any claim or legal proceeding is considered probable and the amount is estimable, the Company accrues a liability for the estimated loss. Legal proceedings are inherently uncertain and, as circumstances change, it is possible that the amount of any accrued liability may increase, decrease or be eliminated.

The Company has determined that, except as set forth below, no disclosure of estimated loss is required for a claim against the Company because: (1) there is not a reasonable possibility that a loss exceeding amounts already recognized (if any) may be incurred with respect to such claim; (2) a reasonably possible loss or range of loss cannot be estimated; or (3) such estimate is immaterial.

Legal Settlement

There have been no changes to the disclosure related to Mentor Graphics Corporation (now part of Siemens AG) since the Company's Annual Report on Form 10-K for the fiscal year ended October 31, 2020. See Note 9. Contingencies of the Annual Report for further information.

Tax Matters

The Company undergoes examination from time to time by U.S. and foreign authorities for non-income based taxes, such as sales, use and value-added taxes, and is currently under examination by tax authorities in certain jurisdictions. If the potential loss from such examinations is considered probable and the amount or the range of loss could be estimated, the Company would accrue a liability for the estimated expense.

In addition to the foregoing, the Company is, from time to time, party to various other claims and legal proceedings in the ordinary course of its business, including with tax and other governmental authorities. For a description of certain of these other matters, see Note 17. Income Taxes.

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

This Quarterly Report on Form 10-Q includes forward-looking statements, which involve risks, uncertainties and other factors that could cause our actual results, time frames or achievements to differ materially from those expressed or implied in our forward-looking statements. Readers are urged to carefully review and consider the various disclosures regarding these risks and uncertainties made in this Quarterly Report on Form 10-Q, including those identified below in Part II, Item 1A. Risk Factors, and in other documents we file from time to time with the Securities and Exchange Commission (SEC). Forward-looking statements include any statements that are not statements of historical fact and include, but are not limited to, statements concerning business outlook, opportunities and strategies; customer demand and market expansion; strategies related to our products and technology; our planned product releases and capabilities; industry growth rates; software trends; planned acquisitions and buybacks; the expected impact of U.S. and foreign government actions on our financial results; and the expected impact and duration of the COVID-19 pandemic. Forward-looking statements may be identified by words including, but not limited to, "may," "will," "could," "would," "can," "should," "anticipate," "expect," "intend," "believe," "estimate," "project," "continue," "forecast," "likely," "potential," "seek," or the negatives of such terms and similar expressions. The information included herein represents our estimates and assumptions as of the date of this filing. Unless required by law, we undertake no obligation to update publicly any forward-looking statements, or to update the reasons actual results could differ materially from those anticipated in these forward-looking statements, even if new information becomes available in the future. All subsequent written or oral forward-looking statements attributable to Synopsys or persons acting on our behalf are expressly qualified in their entirety by these cautionary statements.

The following summary of our financial condition and results of operations should be read together with our unaudited condensed consolidated financial statements and the related notes thereto contained in Part I, Item 1 of this report and with our audited consolidated financial statements and the related notes thereto contained in our Annual Report on Form 10-K for the fiscal year ended October 31, 2020, as filed with the SEC on December 15, 2020.

Overview

Business Summary

Synopsys, Inc. provides products and services used across the entire Silicon to Software spectrum to bring Smart Everything to life. From engineers creating advanced semiconductors to product teams developing advanced electronic systems to software developers seeking to ensure the security and quality of their code, our customers trust that our technologies will enable them to meet new requirements for low power as well as reliability, mobility and security. We are a global leader in supplying the electronic design automation (EDA) software that engineers use to design and test integrated circuits (ICs), also known as chips. We also offer semiconductor intellectual property (IP) products, which are pre-designed circuits that engineers use as components of larger chip designs rather than designing those circuits themselves. We provide software and hardware used to validate the electronic systems that incorporate chips and the software that runs on them. To complement these offerings, we provide technical services and support to help our customers develop advanced chips and electronic systems. These products and services are part of our Semiconductor & System Design segment.

We are also a leading provider of software tools and services that improve the security, quality and compliance of software in a wide variety of industries, including electronics, financial services, automotive, medicine, energy and industrials. These tools and services are part of our Software Integrity segment.

Our EDA and IP customers are generally semiconductor and electronics systems companies. Our solutions help these companies overcome the challenges of developing increasingly advanced electronics products while also helping them reduce their design and manufacturing costs. While our products are an important part of our customers' development process, our sales could be affected based on their research and development budgets, and our customers' spending decisions may be affected by their business outlook and willingness to invest in new and increasingly complex chip designs.

Our Software Integrity business delivers products and services that enable software developers to test their code—while it is being written—for known security vulnerabilities and quality defects, as well as testing for open source security vulnerabilities and license compliance. Our Software Integrity customers are software developers across many industries, including, but also well beyond, the semiconductor and systems industries. Our Software Integrity products and services form a platform that helps our customers build security into the software development lifecycle and across the entire cyber supply chain.

We have consistently grown our revenue since 2005, despite periods of global economic uncertainty. We achieved these results because of our solid execution, leading technologies and strong customer relationships, and because we recognize our revenue for software licenses over the arrangement period, which typically approximates three years. See Note 2 of the Notes to Consolidated Financial Statements in our Annual Report for a discussion on our revenue recognition policy. The revenue we recognize in a particular period generally results from selling efforts in prior periods rather than the current period. As a result, decreases as well as increases in customer spending do not immediately affect our revenues in a significant way, but may affect our revenues and financial performance in future periods.

Our growth strategy is based on maintaining and building on our leadership in our EDA products, expanding and proliferating our IP offerings, driving growth in the software security and quality market and continuing to expand our product portfolio and our total addressable market. In addition, due to our adoption of ASC 606 in the beginning of fiscal 2019, the way in which we are required to account for certain types of arrangements has increased the variability in our total revenue from period to period. Nevertheless, the accounting impact has not affected the cash generated from our business. Based on our leading technologies, customer relationships, business model, diligent expense management and acquisition strategy, we believe that we will continue to execute our strategies successfully.

COVID-19 Pandemic

While the COVID-19 pandemic changed the physical working environment of the majority of our workforce to working from home, it otherwise caused only minor disruptions to our business operations, with a limited impact on our operating results thus far. Given the unpredictable nature of the COVID-19 pandemic's continuing impact on the global economy, our historical results may not be an indication of future performance. We have reopened certain of our non-U.S. offices, subject to operating restrictions to protect public health and the health and safety of our employees. We are preparing plans to open additional offices, including our headquarters in Mountain View, California, in a phased approach in compliance with applicable guidelines, with a focus on employee safety and optimal work environment.

The extent to which the COVID-19 pandemic impacts our business operations in future periods will depend on multiple uncertain factors, including the duration and scope of the pandemic, its overall negative impact on the global economy generally and the semiconductor and electronics industries specifically, and continued responses by governments and businesses to COVID-19. We have not identified trends that we expect will materially impact our future operating results at this time. As we recognize our revenue for software licenses over the arrangement period, any potential impact related to COVID-19 may be delayed. We have not observed any changes in the design activity of customers, but in prior quarters we did experience some slowdowns in customer commitments in our Software Integrity segment. We have not received any significant requests from our customers to either delay payments or modify arrangements due to COVID-19. However, this situation could change in future periods, and the extent that these requests affect our business is uncertain. We have also experienced minor disruptions in our hardware supply chain, which we have been able to address with minimal impact to our business operations to date.

We will continue to consider the potential impact of the COVID-19 pandemic on our business operations. Although no material impairment or other effects have been identified to date related to the COVID-19 pandemic, there is substantial uncertainty in the nature and degree of its continued effects over time. That uncertainty affects management's accounting estimates and assumptions, which could result in greater variability in a variety of areas that depend on these estimates and assumptions as additional events and information become known.

See Part II, Item 1A, *Risk Factors* for further discussion of the possible impact of the COVID-19 pandemic on our business, operations and financial condition.

Business Segments

Semiconductor & System Design. This segment includes our advanced silicon design, verification products and services and semiconductor IP portfolio, which encompasses products and services that serve companies primarily in the semiconductor and electronics industries. EDA includes digital, custom and Field Programmable Gate Array (FPGA) IC design software, verification products and manufacturing software products. Designers use these products to automate the highly complex IC design process and to reduce defects that could lead to expensive design or manufacturing re-spins or suboptimal end products. For IP, we are a leading provider of high-quality, silicon-proven IP solutions for system-on-chips (SoCs). This includes IP that has been optimized to address specific application requirements for the mobile, automotive, digital home, internet of things and cloud computing markets, enabling designers to quickly develop SoCs in these areas.

Software Integrity. This segment includes a broad portfolio of products and services such as leading quality testing technologies, automated analysis and consulting experts. Our Polaris Software Integrity Platform™ is an integrated cloud-based solution that unites key elements to provide an even more valuable way for developers to better develop personalized approaches for open source license compliance and detect and remediate known security vulnerabilities and quality defects early in the development process, thereby minimizing risk and maximizing productivity.

Fiscal Year End

Our fiscal year ends on the Saturday nearest to October 31 and consists of 52 weeks, with the exception that approximately every five years, we have a 53-week year. When a 53-week year occurs, we include the additional week in the first quarter to realign fiscal quarters with calendar quarters. Fiscal 2021 and 2020 are 52-week years ending on October 30, 2021 and October 31, 2020, respectively.

Our results of operations for the three and nine months of fiscal 2021 and 2020 ended on July 31, 2021 and August 1, 2020, respectively. For presentation purposes, this Form 10-Q refers to the closest calendar month end.

Financial Performance Summary

In the third quarter of fiscal 2021 compared to the same period of fiscal 2020, our financial performance reflects the following:

- Revenues were $1,057.1 million, an increase of $93.0 million or 10%, primarily due to our continued organic growth.
- Total cost of revenue and operating expenses were $855.2 million, an increase of $101.7 million or 13%, primarily due to increases of $96.2 million in employee-related costs resulting from headcount increases through organic growth and acquisitions and $17.1 million in restructuring costs, partially offset by lower deferred compensation expenses of $15.8 million.
- Operating income was $201.9 million, a decrease of $8.7 million or 4% due to higher restructuring costs.

Critical Accounting Policies and Estimates

Our discussion and analysis of our financial results under *Results of Operations* below are based on our unaudited condensed consolidated financial statements, which we have prepared in accordance with U.S. GAAP. In preparing these financial statements, we make assumptions, judgments and estimates that can affect the reported amounts of assets, liabilities, revenues and expenses and net income. On an ongoing basis, we evaluate our estimates based on historical experience and various other assumptions we believe are reasonable under the circumstances. Our actual results may differ from these estimates. See Note 2 of Notes to Unaudited Condensed Consolidated Financial Statements for further information on our significant accounting policies.

The accounting policies that most frequently require us to make assumptions, judgments and estimates, and therefore are critical to understanding our results of operations, are:

- Revenue recognition;
- Valuation of business combinations; and
- Income taxes.

See Critical Accounting Policies and Estimates in our Annual Report for further information.

Results of Operations

Revenue

Our revenues are generated from two business segments: the Semiconductor & System Design segment and the Software Integrity segment. See Note 15 of Notes to Unaudited Condensed Consolidated Financial Statements for additional information about our reportable segments and revenue by geographic regions.

Further disaggregation of the revenues into various products and services within these two segments is summarized as follows:

Semiconductor & System Design Segment

This segment is comprised of the following:

- EDA software includes digital, custom and Field Programmable Gate Array (FPGA) IC design software, verification products and obligations to provide unspecified updates and support services. EDA products and services are typically sold through Technology Subscription License (TSL) arrangements that grant customers the right to access and use all of the licensed products at the outset of an arrangement and software updates are generally made available throughout the entire term of the arrangement, which is typically three years. We have concluded that the software licenses in TSL contracts are not distinct from the obligation to provide unspecified software updates to the licensed software throughout the license term, because the multiple software licenses and support represent inputs to a single, combined offering, and timely, relevant software updates are integral to maintaining the utility of the software licenses. We recognize revenue for the combined performance obligation under TSL contracts ratably over the term of the license.
- IP & System Integration includes our DesignWare® IP portfolio and system-level products and services. These arrangements generally have two performance obligations which consist of transferring of the licensed IP and providing related support, which includes rights to technical support and software updates that are provided over the support term and are transferred to the customer over time. Revenue allocated to the IP licenses is recognized at a point in time upon the later of the delivery date or the beginning of the license period, and revenue allocated to support is recognized over the support term. Royalties are recognized as revenue in the quarter in which the applicable customer sells its products that incorporate our IP. Payments for IP contracts are generally received upon delivery of the IP. Revenue related to the customization of certain IP is recognized as “Professional Services.”
- In the case of arrangements involving the sale of hardware products, we generally have two performance obligations. The first performance obligation is to transfer the hardware product, which includes software integral to the functionality of the hardware product. The second performance obligation is to provide maintenance on the hardware and its embedded software, which includes rights to technical support, hardware repairs and software updates that are all provided over the same term and have the same time-based pattern of transfer to the customer. The portion of the transaction price allocated to the hardware product is generally recognized as revenue at the time of shipment because the customer obtains control of the product at that point in time. We have concluded that control generally transfers at that point in time because the customer has the ability to direct the use of the asset and an obligation to pay for the hardware. The portion of the transaction price allocated to the maintenance obligation is recognized as revenue ratably over the maintenance term.
- Revenue from Professional Service contracts is recognized over time, generally using costs incurred or hours expended to measure progress. We have a history of reasonably estimating project status and the costs necessary to complete projects. A number of internal and external factors can affect these estimates, including labor rates, utilization and efficiency variances and specification and testing requirement changes.

Software Integrity Segment

- We sell Software Integrity products in arrangements that provide customers the right to software licenses, maintenance updates and technical support. Over the term of these arrangements, the customer expects us to provide integral maintenance updates to the software licenses, which help customers protect their own software from new critical quality defects and potential security vulnerabilities. The licenses and maintenance updates serve together to fulfill our commitment to the customer as both work together to provide functionality to the customer and represent a combined performance obligation. We recognize revenue for the combined performance obligation over the term of the arrangement.

Most of our customer arrangements involve hundreds of products and various license rights, and our customers bargain with us over many aspects of these arrangements. For example, they often demand a broader portfolio of solutions, support and services and seek more favorable terms such as expanded license usage, future purchase rights and other unique rights at an overall lower total cost. No single factor typically drives our customers' buying decisions, and we compete on all fronts to serve customers in highly competitive markets. Customers generally negotiate the total value of the arrangement rather than just unit pricing or volumes.

Total Revenue

	July 31,			
	2021	2020	$ Change	% Change
		(dollars in millions)		
Three months ended				
Semiconductor & System Design Segment	$ 959.1	$ 870.7	$ 88.4	10 %
Software Integrity Segment	98.0	93.4	4.6	5 %
Total	$ 1,057.1	$ 964.1	$ 93.0	10 %
Nine months ended				
Semiconductor & System Design Segment	$ 2,768.0	$ 2,392.5	$ 375.5	16 %
Software Integrity Segment	283.8	267.3	16.5	6 %
Total	$ 3,051.8	$ 2,659.8	$ 392.0	15 %

The overall growth of our business has been the primary driver of the increase in our revenues. Our revenues are subject to fluctuations, primarily due to customer requirements including the timing and value of contract renewals. For example, we experience fluctuations in our revenues due to factors such as the timing of IP product sales, consulting projects, FSA drawdowns, royalties, and hardware sales. As revenues from IP products sales and hardware sales are recognized upfront, customer demand and timing requirements for such IP products and hardware have resulted in increased variability of our total revenues.

The increase in total revenues for the three and nine months ended July 31, 2021 compared to the same periods in fiscal 2020 was primarily attributable to the continued organic growth of the business in most product categories and regions.

See Note 15 of Notes to Unaudited Condensed Consolidated Financial Statements for a discussion of revenue by geographic areas.

Time-Based Products Revenue

	July 31,			
	2021	2020	$ Change	% Change
		(dollars in millions)		
Three months ended	$ 665.6	$ 612.1	$ 53.5	9 %
Percentage of total revenue	63 %	63 %		
Nine months ended	$ 1,945.6	$ 1,758.6	$ 187.0	11 %
Percentage of total revenue	64 %	66 %		

The increase in time-based products revenue for the three and nine months ended July 31, 2021 compared to the same periods in fiscal 2020 was primarily attributable to an increase in TSL license revenue and strong renewals from arrangements booked in prior periods.

Upfront Products Revenue

	July 31, 2021	July 31, 2020	$ Change	% Change
	(dollars in millions)			
Three months ended	$ 203.3	$ 210.9	$ (7.6)	(4)%
Percentage of total revenue	19 %	22 %		
Nine months ended	$ 586.8	$ 491.4	$ 95.4	19 %
Percentage of total revenue	19 %	19 %		

Changes in upfront products revenue are generally attributable to normal fluctuations in the extent and timing of customer requirements, which can drive the amount of upfront orders and revenue in any particular period.

The decrease in upfront product revenue for the three months ended July 31, 2021 compared to the same period in fiscal 2020 was primarily due to a decrease in the sale of IP products driven by lower demand from customers, partially offset by an increase in the sale of hardware products driven by timing of customer requirements.

The increase in upfront products revenue for the nine months ended July 31, 2021 compared to the same period in fiscal 2020 was primarily due to an increase in the sale of IP products in the first half of fiscal 2021 and hardware products driven by timing of customer requirements.

Upfront products revenue as a percentage of total revenue will likely fluctuate based on the timing of IP products and hardware sales. Such fluctuations will continue to be impacted by the timing of shipments or FSA drawdowns due to customer requirements.

Maintenance and Service Revenue

	July 31, 2021	July 31, 2020	$ Change	% Change
	(dollars in millions)			
Three months ended				
Maintenance revenue	$ 61.0	$ 43.7	$ 17.3	40 %
Professional services and other revenue	127.3	97.4	29.9	31 %
Total	$ 188.3	$ 141.1	$ 47.2	33 %
Percentage of total revenue	18 %	15 %		
Nine months ended				
Maintenance revenue	$ 172.6	$ 128.8	$ 43.8	34 %
Professional services and other revenue	346.7	281.0	65.7	23 %
Total maintenance and service revenue	$ 519.3	$ 409.8	$ 109.5	27 %
Percentage of total revenue	17 %	15 %		

The increase in maintenance revenue for the three and nine months ended July 31, 2021 compared to the same periods in fiscal 2020 was primarily due to an increase in the volume of arrangements that include maintenance.

The increase in professional services and other revenue for the three and nine months ended July 31, 2021 compared to the same periods in fiscal 2020 was primarily due to the timing of IP consulting projects.

Cost of Revenue

	July 31, 2021	July 31, 2020	$ Change	% Change
	(dollars in millions)			
Three months ended				
Cost of products revenue	$ 127.6	$ 118.5	$ 9.1	8 %
Cost of maintenance and service revenue	65.6	60.8	4.8	8 %
Amortization of intangible assets	11.9	13.7	(1.8)	(13)%
Total	$ 205.1	$ 193.0	$ 12.1	6 %
Percentage of total revenue	19 %	20 %		
Nine months ended				
Cost of products revenue	$ 389.7	$ 344.5	$ 45.2	13 %
Cost of maintenance and service revenue	202.2	184.9	17.3	9 %
Amortization of intangible assets	35.2	40.7	(5.5)	(14)%
Total	$ 627.1	$ 570.1	$ 57.0	10 %
Percentage of total revenue	21 %	21 %		

We divide cost of revenue into three categories: cost of products revenue, cost of maintenance and service revenue, and amortization of intangible assets. We segregate expenses directly associated with consulting and training services from cost of products revenue associated with internal functions providing license delivery and post-customer contract support services. We then allocate these group costs between cost of products revenue and cost of maintenance and service revenue based on products and maintenance and service revenue reported.

Cost of products revenue. Cost of products revenue includes costs related to products sold and software licensed, allocated operating costs related to product support and distribution costs, royalties paid to third-party vendors, and the amortization of capitalized research and development costs associated with software products that had reached technological feasibility.

Cost of maintenance and service revenue. Cost of maintenance and service revenue includes operating costs related to maintaining the infrastructure necessary to operate our services and costs to deliver our consulting services, such as hotline and on-site support, production services and documentation of maintenance updates. We expect our cost of maintenance and service revenue to increase in future periods because of recent acquisitions, but we do not expect the impact to be material to our total cost of revenue.

Amortization of intangible assets. Amortization of intangible assets, which is recorded to cost of revenue and operating expenses, includes the amortization of core/developed technology, trademarks, trade names, customer relationships, covenants not to compete related to acquisitions and certain contract rights related to acquisitions.

The increase in cost of revenue for the three months ended July 31, 2021 compared to the same period in fiscal 2020 was primarily due to an increase of $16.3 million in personnel-related expenses as a result of headcount increases from organic hiring and acquisitions, partially offset by decreases of $1.8 million in amortization of intangible assets, $1.7 million in servicing IP consulting arrangements, $1.4 million in depreciation and maintenance expenses, and lower deferred compensation expenses of $1.9 million.

The increase in cost of revenue for the nine months ended July 31, 2021 compared to the same period in fiscal 2020, was primarily due to increases of $39.1 million in personnel-related costs as a result of headcount increases from organic hiring and acquisitions, $20.1 million in hardware related costs, $5.0 million in servicing IP consulting arrangements, and higher deferred compensation expenses of $3.8 million, partially offset by decreases of $5.5 million in amortization of intangible assets and $3.4 million in depreciation and maintenance expenses.

Changes in other cost of revenue categories for the above-mentioned periods were not individually material.

Operating Expenses

Research and Development

	July 31,			
	2021	2020	$ Change	% Change
	(dollars in millions)			
Three months ended	$ 371.1	$ 322.6	$ 48.5	15 %
Percentage of total revenue	35 %	33 %		
Nine months ended	$ 1,091.0	$ 939.5	$ 151.5	16 %
Percentage of total revenue	36 %	35 %		

The increase in research and development expenses for the three months ended July 31, 2021 compared to the same period in fiscal 2020 was primarily due to an increase of $51.3 million in personnel-related costs as a result of headcount increases, including those from acquisitions, partially offset by lower deferred compensation expenses of $8.9 million.

The increase in research and development expenses for the nine months ended July 31, 2021 compared to the same period in fiscal 2020 was primarily due to an increase of $122.3 million in personnel-related costs as a result of headcount increases, including those from acquisitions, and higher deferred compensation expenses of $24.8 million.

Changes in other research and development expense categories for the above-mentioned periods were not individually material.

Sales and Marketing

	July 31,			
	2021	2020	$ Change	% Change
	(dollars in millions)			
Three months ended	$ 171.4	$ 156.5	$ 14.9	10 %
Percentage of total revenue	16 %	16 %		
Nine months ended	$ 514.8	$ 455.5	$ 59.3	13 %
Percentage of total revenue	17 %	17 %		

The increase in sales and marketing expenses for the three ended July 31, 2021 compared to the same period in fiscal 2020 was primarily due to an increase of $16.6 million in personnel-related costs as a result of an increase in bonuses, partially offset by lower deferred compensation expenses of $3.0 million.

The increase in sales and marketing expenses for the nine months ended July 31, 2021 compared to the same period in fiscal 2020 was primarily due to an increase of $52.8 million in personnel-related costs as a result of an increase in sales commissions and bonuses, and higher deferred compensation expenses of $9.3 million, partially offset by a decrease of $4.3 million in travel and marketing expenses as a result of travel restrictions related to COVID-19.

Changes in other sales and marketing expense categories for the above-mentioned periods were not individually material.

General and Administrative

	July 31, 2021	July 31, 2020	$ Change	% Change
	(dollars in millions)			
Three months ended	$ 83.8	$ 73.5	$ 10.3	14 %
Percentage of total revenue	8 %	8 %		
Nine months ended	$ 234.0	$ 204.7	$ 29.3	14 %
Percentage of total revenue	8 %	8 %		

The increase in general and administrative expenses for the three months ended July 31, 2021 compared to the same period in fiscal 2020 was primarily due to increases of $12.0 million in personnel-related costs, partially offset by lower deferred compensation expenses of $2.0 million.

The increase in general and administrative expenses for the nine months ended July 31, 2021 compared to the same period in fiscal 2020 was primarily due to increases of $25.8 million in personnel-related expenses and $2.5 million in professional service costs, and higher deferred compensation expenses of $4.2 million.

Changes in other general and administrative expense categories for the above-mentioned periods were not individually material.

Amortization of Intangible Assets

Amortization of intangible assets includes the amortization of contract rights and the amortization of core/developed technology, trademarks, trade names, customer relationships, and in-process research and development related to acquisitions completed in prior years. Amortization expense is included in the unaudited condensed consolidated statements of operations as follows:

	July 31, 2021	July 31, 2020	$ Change	% Change
	(dollars in millions)			
Three months ended				
Included in cost of revenue	$ 11.9	$ 13.7	$ (1.8)	(13)%
Included in operating expenses	8.6	9.9	(1.3)	(13)%
Total	$ 20.5	$ 23.6	$ (3.1)	(13)%
Percentage of total revenue	2 %	2 %		
Nine months ended				
Included in cost of revenue	$ 35.2	$ 40.7	$ (5.5)	(14)%
Included in operating expenses	25.3	29.5	(4.2)	(14)%
Total	$ 60.5	$ 70.2	$ (9.7)	(14)%
Percentage of total revenue	2 %	3 %		

The decrease in amortization of intangible assets for the three and nine months ended July 31, 2021 compared to the same periods in fiscal 2020 was primarily due to intangible assets that were fully amortized, partially offset by additions of acquired intangible assets.

Restructuring Charges

In the third quarter of fiscal 2021, our management approved, committed and initiated a restructuring plan (the Plan) as part of a business reorganization. Total charges under the Plan are expected to be in the range of $42 million and $53 million consist primarily of severance, termination, and retirement benefits under the 2021 Voluntary Retirement Program (VRP). Restructuring charges under the Plan are anticipated to be completed in the first quarter of fiscal 2022.

See Note 8 of Notes to Unaudited Condensed Consolidated Financial Statements for additional information.

Other Income (Expense), Net

	July 31, 2021	July 31, 2020	$ Change	% Change
	(dollars in millions)			
Three months ended				
Interest income	$ 0.7	$ 0.8	$ (0.1)	(13)%
Interest expense	(0.8)	(0.9)	0.1	(11)%
Gain (loss) on assets related to executive deferred compensation plan	10.5	26.2	(15.7)	(60)%
Foreign currency exchange gain (loss)	2.8	0.1	2.7	2,700 %
Other, net	(1.8)	0.1	(1.9)	(1,900)%
Total	$ 11.4	$ 26.3	$ (14.9)	(57)%
Nine months ended				
Interest income	$ 1.4	$ 3.1	$ (1.7)	(55)%
Interest expense	(2.3)	(4.4)	2.1	(48)%
Gain (loss) on assets related to executive deferred compensation plan	62.7	20.2	42.5	210 %
Foreign currency exchange gain (loss)	5.3	5.3	—	— %
Other, net	(5.2)	(1.6)	(3.6)	225 %
Total	$ 61.9	$ 22.6	$ 39.3	174 %

The net decrease in other income (expense) for the three months ended July 31, 2021 as compared to the same period in fiscal 2020 was primarily due to lower gains in the market value of our executive deferred compensation plan assets.

The net increase in other income (expense) for the nine months ended July 31, 2021 as compared to the same period in fiscal 2020 was primarily due to higher gains in the market value of our executive deferred compensation plan assets.

Segment Operating Results

We do not allocate certain operating expenses managed at a consolidated level to our reportable segments. These unallocated expenses consist primarily of stock-based compensation expense, amortization of intangible assets, restructuring, litigation and acquisition-related costs. See Note 15 of Notes to Unaudited Condensed Consolidated Financial Statements for more information.

Semiconductor & System Design Segment

	July 31, 2021	July 31, 2020	Change	% Change
	(dollars in millions)			
Three months ended				
Adjusted operating income	$ 328.7	$ 308.7	$ 20.0	6 %
Adjusted operating margin	34 %	35 %	(1)%	(3)%
Nine months ended				
Adjusted operating income	$ 916.4	$ 697.3	$ 219.1	31 %
Adjusted operating margin	33 %	29 %	4 %	14 %

The increase in adjusted operating income for the three and nine months ended July 31, 2021 compared to the same period in fiscal 2020 was primarily due to an increase in revenue from arrangements booked in prior periods.

Software Integrity Segment

	July 31, 2021	July 31, 2020	Change	% Change
	(dollars in millions)			
Three months ended				
Adjusted operating income	$ 8.7	$ 14.8	$ (6.1)	(41)%
Adjusted operating margin	9 %	16 %	(7)%	(44)%
Nine months ended				
Adjusted operating income	$ 25.0	$ 34.6	$ (9.6)	(28)%
Adjusted operating margin	9 %	13 %	(4)%	(31)%

The decrease in the adjusted operating income for the three and nine months ended July 31, 2021 compared to the same periods in fiscal 2020 was primarily due to an increase in operating expenses, partially offset by an increase in revenue from arrangements booked in prior periods.

Income Taxes

Our effective tax rate increased in the three and nine months ended July 31, 2021 as compared to the same periods in fiscal 2020, primarily due to enacted legislation in California which limits the use of California research and development tax credits commencing in fiscal 2021 and the federal taxation of foreign earnings offset by deemed paid foreign tax credits during the three months ended July 31, 2020. Our effective tax rate also increased in the nine months ended July 31, 2021 as compared to the same period in fiscal 2020 primarily due to the realizability of U.S. foreign tax credits in the nine months ended July 31, 2020.

See Note 17 of Notes to Unaudited Condensed Consolidated Financial Statements for further discussion.

Liquidity and Capital Resources

Our sources of cash and cash equivalents are funds generated from our business operations and funds that may be drawn down under our revolving credit and term loan facilities.

We have considered the potential impact of the COVID-19 pandemic on our liquidity and capital resources. Although we have not observed any material effects on our liquidity, collections from customers or other working capital requirements due to the COVID-19 pandemic to date, there is substantial uncertainty that could result in greater variability as additional events and information become known. We believe that our existing balances of cash and cash equivalents will be sufficient to satisfy our working capital needs, capital asset purchases, share repurchases, acquisitions, debt repayments and other liquidity requirements associated with our existing operations. We are continuously evaluating the COVID-19 pandemic's effects and taking steps to mitigate known risks, including potential constraints on our liquidity and capital resources as a result of customers' reduced expenditures or disruptions to our supply chain. In light of that ongoing assessment, we may choose to temporarily defer certain expenditures due to the effects of the COVID-19 pandemic.

As of July 31, 2021, we held an aggregate of $854.9 million in cash, cash equivalents and short-term investments in the United States and an aggregate of $675.3 million in our foreign subsidiaries. In addition, we have provided foreign withholding taxes on the undistributed earnings of certain of our foreign subsidiaries to the extent such earnings are no longer considered to be indefinitely reinvested in the operations of those subsidiaries.

During the nine months ended July 31, 2021, there were no significant changes to our estimates of future payments under our fixed contractual obligations and commitments as presented in Part II, Item 7, *Management's Discussion and Analysis of Financial Condition and Results of Operations* included in our Annual Report on Form 10-K for the fiscal year ended October 31, 2020.

The following sections discuss changes in our unaudited condensed consolidated balance sheets and statements of cash flows, and other commitments of our liquidity and capital resources during the nine months ended July 31, 2021.

Cash and Cash Equivalents

	July 31, 2021	October 31, 2020	$ Change	% Change
	(dollars in millions)			
Cash and cash equivalents	$ 1,385.4	$ 1,235.7	$ 149.7	12 %
Short-term investments	$ 144.8	$ —	$ 144.8	100 %
Total	$ 1,530.2	$ 1,235.7	$ 294.5	24 %

Cash and cash equivalents and short-term investments increased primarily due to higher cash from our operations and cash received from option exercises and employee stock purchases. The increase in cash and cash equivalents and short-term investments was partially offset by stock repurchases, cash used for acquisitions, purchases of property and equipment and repayment of debt.

Cash Flows

	Nine Months Ended July 31,		
	2021	2020	$ Change
	(dollars in millions)		
Cash provided by operating activities	$ 1,122.1	$ 789.2	$ 332.9
Cash used in investing activities	(385.9)	(324.9)	(61.0)
Cash used in financing activities	(589.4)	(151.5)	(437.9)

Cash Provided by Operating Activities

We expect cash from our operating activities to fluctuate as a result of a number of factors, including the timing of our billings and collections, our operating results, and the timing and amount of tax and other liability payments. Cash provided by our operations is dependent primarily upon the payment terms of our license agreements. We generally receive cash from upfront arrangements much sooner than from time-based products revenue, in which the license fee is typically paid either quarterly or annually over the term of the license.

Cash provided by operating activities for the nine months ended July 31, 2021 was higher compared to the same period in fiscal 2020, primarily attributable to higher operating income and higher cash collections, partially offset by higher disbursements for operations, including tax payments.

Cash Used in Investing Activities

Cash used in investing activities for the nine months ended July 31, 2021 was higher compared to the same period in fiscal 2020, primarily due to purchase of short-term investments of $146.1 million, partially offset by lower purchases of property and equipment of $53.3 million and lower cash paid for acquisitions of $37.0 million.

Cash Used in Financing Activities

Cash used in financing activities for the nine months ended July 31, 2021 was higher compared to the same period in fiscal 2020, primarily due to increased stock repurchase activities of $373.1 million and lower proceeds of $276.5 million from credit facilities drawdowns and , partially offset by lower debt repayments of $262.6 million.

Working Capital

Working capital is comprised of current assets less current liabilities, as shown on our unaudited condensed consolidated balance sheets. Increases in our working capital were primarily due to an increase in cash and cash equivalents of $149.7 million and an increase in short term investments of $144.8 million, partially offset by a decrease in accounts receivable of $202.9 million and an increase in deferred revenue of $154.3 million.

We did not see a significant impact on our working capital during this period from the COVID-19 pandemic.

Other Commitments — Credit and Term Loan Facilities

As of July 31, 2021, we had $82.5 million outstanding balance, net of debt issuance costs, under the Term Loan. Outstanding principal payments under the Term Loan are due as follows:

Fiscal year	(in thousands)
Remainder of fiscal 2021	$ 7,500
2022	75,000
Total	$ 82,500

As of October 31, 2020, we had $102.1 million outstanding balance, net of debt issuance costs, under the Term Loan, of which $75.0 million was classified as long-term liabilities.

There was no outstanding balance under the Revolver as of July 31, 2021 and October 31, 2020. We expect our borrowings under the Revolver will fluctuate from quarter to quarter. Borrowings bear interest at a floating rate based on a margin over our choice of market observable base rates as defined in the Credit Agreement. As of July 31, 2021, borrowings under the Term Loan bore interest at LIBOR +1.125% and the applicable interest rate for the Revolver was LIBOR +1.000%. In addition, commitment fees are payable on the Revolver at rates between 0.125% and 0.200% per year based on our leverage ratio on the daily amount of the revolving commitment.

In July 2018, we entered into a 12-year 220.0 million RMB (approximately $33.0 million) credit agreement with a lender in China to support our facilities expansion. Borrowings bear interest at a floating rate based on the 5 year Loan Prime Rate plus 0.74%. As of July 31, 2021, we had $24.8 million outstanding under the agreement.

See Note 9 of Notes to Unaudited Condensed Consolidated Financial Statements for additional information.

Other

As of July 31, 2021, our cash equivalents consisted primarily of taxable money market mutual funds, time deposits and highly liquid investments with maturities of three months or less. Our short term investments primarily include U.S. government and municipal obligations, investment-grade available-for-sale debt and asset backed securities. We follow an established investment policy and set of guidelines to monitor, manage and limit our exposure to interest rate and credit risk.

We proactively manage our cash equivalents balances and closely monitor our capital and stock repurchase expenditures to ensure ample liquidity. Additionally, we believe the overall credit quality of our portfolio is strong, with our global excess cash, and our cash equivalents, invested in banks and securities with a weighted-average credit rating exceeding AA. The majority of our investments are classified as Level 1 or Level 2 investments, as measured under fair value guidance. See Notes 6 and 7 of Notes to Unaudited Condensed Consolidated Financial Statements.

We believe that our current cash and cash equivalents, cash generated from operations, and available credit under our Revolver will satisfy our routine business requirements for at least the next 12 months and the foreseeable future.

Item 3. *Quantitative and Qualitative Disclosures About Market Risk*

See Other Commitments — Credit and Term Loan Facilities, Item 2. *Management's Discussion and Analysis of Financial Condition and Results of Operations*, regarding borrowings under our senior unsecured revolving credit facility.

As of July 31, 2021, our exposure to market risk has not changed materially since October 31, 2020. For more information on financial market risks related to changes in interest rates and foreign currency rates, reference is made to Item 7A. *Quantitative and Qualitative Disclosures About Market Risk* contained in Part II of our Annual Report on Form 10-K for the fiscal year ended October 31, 2020, filed with the SEC on December 15, 2020.

Item 4. *Controls and Procedures*

(a) *Evaluation of Disclosure Controls and Procedures.* As of July 31, 2021, Synopsys carried out an evaluation under the supervision and with the participation of Synopsys' management, including the Co-Chief Executive Officers and Chief Financial Officer, of the effectiveness of the design and operation of Synopsys' disclosure controls and procedures (as such term is defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the Exchange Act)). There are inherent limitations to the effectiveness of any system of disclosure controls and procedures. Accordingly, even effective disclosure controls and procedures can only provide reasonable, not absolute, assurance of achieving their control objectives. Our Co-Chief Executive Officers and Chief Financial Officer have concluded that, as of July 31, 2021, Synopsys' disclosure controls and procedures were effective to provide reasonable assurance that information required to be disclosed in the reports Synopsys files and submits under the Exchange Act is recorded, processed, summarized and reported as and when required, and that such information is accumulated and communicated to Synopsys' management, including the Co-Chief Executive Officers and Chief Financial Officer, to allow timely decisions regarding its required disclosure.

(b) *Changes in Internal Control over Financial Reporting.* There were no changes in Synopsys' internal control over financial reporting during the fiscal quarter ended July 31, 2021 that have materially affected, or are reasonably likely to materially affect, Synopsys' internal control over financial reporting.

PART II. OTHER INFORMATION

Item 1. *Legal Proceedings*

We are subject to routine legal proceedings, as well as demands, claims and threatened litigation that arise in the normal course of our business. The ultimate outcome of any litigation is often uncertain and unfavorable outcomes could have a negative impact on our results of operations and financial condition. Regardless of outcome, litigation can have an adverse impact on Synopsys because of the defense costs, diversion of management resources and other factors.

We regularly review the status of each significant matter and assess its potential financial exposure. If the potential loss from any claim or legal proceeding is considered probable and the amount is estimable, we accrue a liability for the estimated loss. Legal proceedings are inherently uncertain and as circumstances change, it is possible that the amount of any accrued liability may increase, decrease, or be eliminated.

In July 2017, the Hungarian Tax Authority (HTA) issued a final assessment against Synopsys' Hungarian subsidiary (Synopsys Hungary) for fiscal years 2011 through 2013. The HTA disallowed Synopsys Hungary's tax positions taken during these years regarding the timing of the deduction of research expenses and applied withholding taxes on certain payments made to affiliates, resulting in an aggregate tax assessment of approximately $44.5 million and interest and penalties of $18.0 million. On August 2, 2017, Synopsys Hungary filed a claim contesting the final assessment with the Hungarian Administrative Court (the Administrative Court). On November 16, 2017, Synopsys Hungary paid the assessment as required by law, while continuing its challenge to the assessment in court. Hearings were held in February and July 2018, February 26, 2019 and April 30, 2019. On December 10, 2018, Synopsys withdrew its claim contesting the final assessment with regard to the timing of the deduction of research expenses, resulting in a remaining disputed tax assessment of approximately $25.0 million and interest and penalties of $11.0 million. On April 30, 2019, the Administrative Court ruled against Synopsys Hungary. The Administrative Court's opinion was received on May 16, 2019. Synopsys Hungary filed an appeal with the Hungarian Supreme Court on July 5, 2019. In the second quarter of 2019, as a result of the Court's decision, we recorded a tax expense due to an unrecognized tax benefit of $17.4 million, which is net of estimated U.S. foreign tax credits for the tax assessments. The Hungarian Supreme Court heard our appeal on November 12, 2020 and remanded the case to the Hungarian Administrative Court for further proceedings. We received the Hungarian Supreme Court's written decision in the first quarter of fiscal 2021. On April 27, 2021, the Administrative Court reheard the case and again ruled against Synopsys Hungary. We received the written opinion from the Administrative Court on May 19, 2021 and filed an appeal with the Hungarian Supreme Court on July 19, 2021.

For further discussion of the Hungary audit, see Note 17 of Notes to Unaudited Condensed Consolidated Financial Statements under the heading "Non-U.S. Examinations."

Item 1A. *Risk Factors*

A description of the risk factors associated with our business is set forth below. The risks and uncertainties described below could cause our actual results to differ materially from the results contemplated by the forward-looking statements contained in this report. Investors should carefully consider these risks and uncertainties before investing in our common stock.

COVID-19 Pandemic Risks

The COVID-19 pandemic could have a material adverse effect on our business, operations and financial condition.

The COVID-19 pandemic has caused minor disruptions to our business operations to date and could have a material adverse effect on our business, operations and financial condition in the future. For example, we have experienced limited hardware supply chain and logistical challenges as well as a slowdown in customer commitments in our Software Integrity segment. In response to the COVID-19 novel coronavirus pandemic, governments and businesses have taken unprecedented actions to contain the virus, including requiring social distancing, implementing travel restrictions, instituting shelter-in-place orders and various other restrictions on non-essential businesses. These restrictions have significantly curtailed global economic activity and have caused substantial volatility and disruption in global financial markets. We transitioned most of our employees in affected regions to work remotely in order to comply with applicable restrictions and government requirements, and implemented travel restrictions and other changes to our business operations. We are continuing to transition employees back into offices in select jurisdictions in conformity with local guidelines and regulations. Each office must follow physical distancing guidelines and affirmative health measures in compliance with applicable local, state and national requirements. Although we have been able to navigate workplace restrictions and limitations with minimal disruptions to our business operations to date, we may further modify our business practices and real estate needs in response to the risks and negative impacts caused by the COVID-19 pandemic, but we cannot be certain that these measures will continue to be successful.

The extent to which the COVID-19 pandemic impacts our business operations in future periods will depend on multiple uncertain factors, including the duration and scope of the pandemic, its overall negative impact on the global economy and, in some cases, the regional and national economies of areas experiencing a localized surge in COVID-19 cases such as the ongoing surge in India, continued responses by governments and businesses to COVID-19 and its variants, the ability to secure timely payment from customers, the ability to accurately estimate customer demand, reduced willingness of current and potential customers to purchase our products and services due to their own business and market uncertainties, the ability of our business partners and third-party providers to fulfill their responsibilities and commitments, the ability to secure adequate and timely supply of equipment and materials from suppliers for our hardware products, and the ability to develop and deliver our products. For example, India reported an unprecedented number of COVID-19 cases earlier in 2021 and many parts of the United States are experiencing an uptick in the number of COVID-19 cases due to variants of COVID-19. While our operations have experienced minor disruptions to date in connection with recent surges in cases, a continued and sustained increase in the amount of COVID-19 cases in India or other countries or regions where we have operations in the future could have a material adverse effect on our or our customers' businesses, operations and financial conditions. In addition, continued weak economic conditions may result in impairment in value of our tangible and intangible assets. The impact of the COVID-19 pandemic may also have the effect of heightening many of the other risks and uncertainties described in this “Risk Factors” section.

Industry Risks

The growth of our business depends primarily on the semiconductor and electronics industries.

The growth of the EDA industry as a whole, our Semiconductor & System Design segment product sales, and to some extent our Software Integrity segment product sales, are dependent on the semiconductor and electronics industries. A substantial portion of our business and revenue depends upon the commencement of new design projects by semiconductor manufacturers, systems companies and their customers. The increasing complexity of designs of systems-on-chips, integrated circuits, electronic systems and customers’ concerns about managing costs have previously led to, and in the future could lead to, a decrease in design starts and design activity in general. For example, in response to this increasing complexity, some customers may choose to focus on one discrete phase of the design process or opt for less advanced, but less risky, manufacturing processes that may not require the most advanced EDA products. Demand for our products and services could decrease and our financial condition and results of operations could be adversely affected if growth in the semiconductor and electronics industries slows or stalls, including due to the impact of the COVID-19 pandemic. Additionally, as the EDA industry has matured, consolidation has resulted in stronger competition from companies better able to compete as sole source vendors. This increased competition may cause our revenue growth rate to decline and exert downward pressure on our operating margins, which may have an adverse effect on our business and financial condition.

Furthermore, the semiconductor and electronics industries have become increasingly complex ecosystems. Many of our customers outsource the manufacture of their semiconductor designs to foundries. Our customers also frequently incorporate third-party IP, whether provided by us or other vendors, into their designs to improve the efficiency of their design process. We work closely with major foundries to ensure that our EDA, IP and manufacturing solutions are compatible with their manufacturing processes. Similarly, we work closely with other major providers of semiconductor IP, particularly microprocessor IP, to optimize our EDA tools for use with their IP designs and to assure that their IP and our own IP products work effectively together, as we may each provide for the design of separate components on the same chip. If we fail to optimize our EDA and IP solutions for use with major foundries' manufacturing processes or major IP providers' products, or if our access to such foundry processes or third-party IP products is hampered, then our solutions may become less desirable to our customers, resulting in an adverse effect on our business and financial condition.

Consolidation among our customers and within the industries in which we operate, as well as our dependence on a relatively small number of large customers, may negatively impact our operating results.

A number of business combinations, including mergers, asset acquisitions and strategic partnerships, among our customers in the semiconductor and electronics industries have occurred over the last several years, and more could occur in the future. Consolidation among our customers could lead to fewer customers or the loss of customers, increased customer bargaining power or reduced customer spending on software and services. Furthermore, we depend on a relatively small number of large customers, and on such customers continuing to renew licenses and purchase additional products from us, for a large portion of our revenues. Reduced customer spending or the loss of a small number of customers, particularly our large customers, could adversely affect our business and financial condition. In addition, we and our competitors from time to time acquire businesses and technologies to complement and expand our respective product offerings. If any of our competitors consolidate or acquire businesses and technologies that we do not offer, they may be able to offer a larger technology portfolio, additional support and service capability or lower prices, which could negatively impact our business and operating results.

Uncertainty in the global economy, and its potential impact on the semiconductor and electronics industries in particular, may negatively affect our business, operating results and financial condition.

Uncertainty caused by the recent challenging global economic conditions, including due to the effects of the COVID-19 pandemic, could lead some of our customers to postpone their decision-making, decrease their spending and/or delay their payments to us. Such caution by customers could, among other things, limit our ability to maintain or increase our sales or recognize revenue from committed contracts. Outside of a slowdown in customer commitments in our Software Integrity segment, we have not seen evidence of impacts on customer orders from the COVID-19 pandemic to date.

We cannot predict the stability of the economy as a whole or the industries in which we operate. Further economic instability could adversely affect the banking and financial services industry and result in credit downgrades of the banks we rely on for foreign currency forward contracts, credit and banking transactions, and deposit services, or cause them to default on their obligations. There is uncertainty regarding how proposed, contemplated or future changes to the complex laws and regulations governing our industry, the banking and financial services industry and the economy could affect our business. In addition, economic conditions could deteriorate in the future, and, in particular, the semiconductor and electronics industries could fail to grow, including as the result of the effects of, among other things, the COVID-19 pandemic, a sustained global semiconductor shortage and any disruption of international trade relationships such as tariffs, export licenses, or other government trade restrictions. If any of these events or disruptions were to occur, the bookings for our products and services could be adversely affected along with our business, operating results and financial condition. Further, the negative impact of these events or disruptions may be deferred due to our business model. Similarly, in the event of future improvements in economic conditions for our customers, the positive impact on our revenues and financial results may be deferred due to our business model. Any of the foregoing could cause adverse effects on our business, operating results and financial condition, and could cause our stock price to decline.

We operate in highly competitive industries, and if we do not continue to meet our customers' demand for innovative technology at lower costs, our products may become noncompetitive and obsolete, and our business and financial condition may be harmed.

In our Semiconductor & System Design segment, we compete against EDA vendors that offer a variety of products and services, such as Cadence Design Systems, Inc. and Mentor Graphics Corporation (now part of Siemens AG). We also compete with other EDA vendors, including new entrants to the marketplace, that offer products focused on one or more discrete phases of the IC design process. Moreover, our customers internally develop design tools and capabilities that compete with our products, including internal designs that compete with our IP products. In the area of IP products, we compete against numerous other IP providers as well as our customers' internally developed IP.

In our Software Integrity segment, we compete with numerous other solution providers, many of which focus on specific aspects of software security or quality analysis. We also compete with frequent new entrants, which include start-up companies and more established software companies.

The industries in which we operate are highly competitive and the demand for our products and services is dynamic and depends on a number of factors, including demand for our customers' products, design starts and our customers' budgetary constraints. Technology in these industries evolves rapidly and is characterized by frequent product introductions and improvements as well as changes in industry standards and customer requirements. For example, the adoption of cloud computing and artificial intelligence technologies can bring new demands and also challenges in terms of disruption to both business models and our existing technology offerings. Semiconductor device functionality requirements continually increase while feature widths decrease, substantially increasing the complexity, cost and risk of chip design and manufacturing. At the same time, our customers and potential customers continue to demand an overall lower total cost of design, which can lead to the consolidation of their purchases with one vendor. In order to succeed in this environment, we must successfully meet our customers' technology requirements and increase the value of our products, while also striving to reduce their overall costs and our own operating costs.

We compete principally on the basis of technology, product quality and features (including ease-of-use), license or usage terms, post-contract customer support, interoperability among products and price and payment terms. Specifically, we believe the following competitive factors affect our success:

- Our ability to anticipate and lead critical development cycles and technological shifts, innovate rapidly and efficiently, improve our existing software and hardware products and successfully develop or acquire such new products;
- Our ability to offer products that provide both a high level of integration into a comprehensive platform and a high level of individual product performance;
- Our ability to enhance the value of our offerings through more favorable terms such as expanded license usage, future purchase rights, price discounts and other differentiating rights, such as multiple tool copies, post-contract customer support, "re-mix" rights that allow customers to exchange the software they initially licensed for other Synopsys products and the ability to purchase pools of technology;
- Our ability to manage an efficient supply chain to ensure availability of hardware products;
- Our ability to compete on the basis of payment terms; and
- Our ability to provide engineering and design consulting for our products.

If we fail to successfully manage these competitive factors, fail to successfully balance the conflicting demands for innovative technology and lower overall costs, or fail to address new competitive forces, our business and financial condition will be adversely affected.

Business Operations Risks

The global nature of our operations exposes us to increased risks and compliance obligations that may adversely affect our business.

We derive roughly half of our revenue from sales outside the United States, and we expect our orders and revenue to continue to depend on sales to customers outside the U.S. We have also continually expanded our non-U.S. operations. This strategy requires us to recruit and retain qualified technical and managerial employees, manage multiple remote locations performing complex software development projects and ensure intellectual property protection outside of the U.S. Our international operations and sales subject us to a number of increased risks, including:

- Ineffective or weaker legal protection of intellectual property rights;
- Uncertain economic and political conditions in countries where we do business;
- Government trade restrictions, including tariffs, export licenses, or other trade barriers, and changes to existing trade arrangements between various countries such as China;
- Difficulties in adapting to cultural differences in the conduct of business, which may include business practices in which we are prohibited from engaging by the Foreign Corrupt Practices Act or other anti-corruption laws;
- Financial risks such as longer payment cycles and difficulty in collecting accounts receivable;
- Inadequate local infrastructure that could result in business disruptions;
- Additional taxes, interest, and potential penalties and uncertainty around changes in tax laws of various countries; and
- Other factors beyond our control such as natural disasters, terrorism, civil unrest, war and infectious diseases and pandemics, including COVID-19.

Furthermore, if any of the foreign economies in which we do business deteriorate or if we fail to effectively manage our global operations, our business and results of operations will be harmed.

There is inherent risk, based on the complex relationships between certain Asian countries such as China and the United States, that political, diplomatic or military events could result in trade disruptions, including tariffs, trade embargoes, export restrictions and other trade barriers. A significant trade disruption, export restriction, or the establishment or increase of any trade barrier in any area where we do business could reduce customer demand and cause customers to search for substitute products and services, make our products and services more expensive or unavailable for customers, increase the cost of our products and services, have a negative impact on customer confidence and spending, make our products less competitive, or otherwise have a materially adverse impact on our future revenue and profits, our customers' and suppliers' businesses, and our results of operations.

For example, beginning in May 2019, the United States government placed certain entities on the "Entity List," restricting the sale of U.S. technologies to the named entities. As a result of this government action, unless and until the restriction is lifted, we are not able to ship products or provide support to these entities. In addition, in May 2020, the United States government placed further restrictions on certain entities on the Entity List to prevent them from sharing designs developed using U.S. software or technology with other entities on the Entity List and obtaining semiconductors manufactured with processes that use U.S. software and technology. In August 2020, the Entity List rules were further revised such that any company with knowledge that a customer will use certain U.S. technologies to design or produce any item for a Huawei-affiliated company on the Entity List must obtain a license prior to any export of such technologies. In December 2020, the Department of Commerce added seventy-seven companies to the Entity List, including Semiconductor Manufacturing International Corporation and ten related entities, which, in all cases, require export licenses for any exports to those entities. The Bureau of Industry and Security also added the first military end user list, where they identified more than one hundred Chinese and Russian companies that are considered to be military end users. We believe that this latest restriction will not materially impact our business at this time, but cannot predict the impact that additional regulatory changes may have on our business in the future. In response to these actions or similar actions taken by the United States, other countries may adopt tariffs and trade barriers that could limit our ability to offer our products and services. Current and potential customers who are concerned or affected by such tariffs or restrictions may respond by developing their own products or replacing our solutions, which would have an adverse effect on our business. In addition, government or customer efforts, attitudes, laws, or policies regarding technology independence may lead to non-U.S. customers favoring their domestic technology solutions that could compete with or replace our products, which would also have an adverse effect on our business.

In addition to tariffs and other trade barriers, our global operations are subject to numerous U.S. and foreign laws and regulations, including those related to anti-corruption, tax, corporate governance, imports and exports, financial and other disclosures, privacy and labor relations. These laws and regulations are complex and may have differing or conflicting legal standards, making compliance difficult and costly. In addition, there is uncertainty regarding how proposed, contemplated or future changes to these complex laws and regulations could affect our business. We may incur substantial expense in complying with the new obligations to be imposed by these laws and regulations, and we may be required to make significant changes in our business operations, all of which may adversely affect our revenues and our business overall. If we violate these laws and regulations, we could be subject to fines, penalties or criminal sanctions, and may be prohibited from conducting business in one or more countries. Although we have implemented policies and procedures to help ensure compliance with these laws and regulations, there can be no assurance that our employees, contractors, agents or partners will not violate such laws and regulations. Any violation individually or in the aggregate could have a material adverse effect on our operations and financial condition.

Our financial results are also affected by fluctuations in foreign currency exchange rates. A weakening U.S. dollar relative to other currencies increases expenses of our foreign subsidiaries when they are translated into U.S. dollars in our consolidated statements of operations. Likewise, a strengthening U.S. dollar relative to other currencies, including the renminbi or Yen, reduces revenue of our foreign subsidiaries upon translation and consolidation. Exchange rates are subject to significant and rapid fluctuations, and therefore we cannot predict the prospective impact of exchange rate fluctuations. Although we engage in foreign currency hedging activity, we may be unable to hedge all of our foreign currency risk, which could have a negative impact on our results of operations.

Our operating results may fluctuate in the future, which may adversely affect our stock price.

Our operating results are subject to quarterly and annual fluctuations, which may adversely affect our stock price. Our historical results should not be viewed as indicative of our future performance due to these periodic fluctuations.

Many factors may cause our revenue or earnings to fluctuate, including:

- Changes in demand for our products—especially products, such as hardware, generating upfront revenue—due to fluctuations in demand for our customers’ products and due to constraints in our customers’ budgets for research and development and EDA products and services;
- Changes in demand for our products due to customers reducing their expenditures, whether as a cost-cutting measure or a result of their insolvency or bankruptcy, and whether due to the COVID-19 pandemic, a sustained global semiconductor shortage or other reasons;
- Product competition in the EDA industry, which can change rapidly due to industry or customer consolidation and technological innovation;
- Our ability to innovate and introduce new products and services or effectively integrate products and technologies that we acquire;
- Failures or delays in completing sales due to our lengthy sales cycle, which often includes a substantial customer evaluation and approval process because of the complexity of our products and services;
- Our ability to implement effective cost control measures;
- Our dependence on a relatively small number of large customers, and on such customers continuing to renew licenses and purchase additional products from us, for a large portion of our revenue;
- Changes to the amount, composition and valuation of, and any impairments to or write-offs of, our inventory;
- Changes in the mix of our products sold, as increased sales of our products with lower gross margins, such as our hardware products, may reduce our overall margins;
- Expenses related to our acquisition and integration of businesses and technology;

- Changes in tax rules, as well as changes to our effective tax rate, including the tax effects of infrequent or unusual transactions and tax audit settlements;
- Delays, increased costs or quality issues resulting from our reliance on third parties to manufacture our hardware products, which includes a sole supplier for certain hardware components;
- Natural variability in the timing of IP drawdowns, which can be difficult to predict;
- General economic and political conditions that affect the semiconductor and electronics industries, such as disruptions to international trade relationships, including tariffs, export licenses, or other trade barriers affecting our or our suppliers' products, as well as impacts due to the COVID-19 pandemic; and
- Changes in accounting standards, which may impact the way we recognize our revenue and costs and impact our earnings.

The timing of revenue recognition may also cause our revenue and earnings to fluctuate. The timing of revenue recognition is affected by factors that include:

- Cancellations or changes in levels of orders or the mix between upfront products revenue and time-based products revenue;
- Delay of one or more orders for a particular period, particularly orders generating upfront products revenue, such as hardware;
- Delay in the completion of professional services projects that require significant modification or customization and are accounted for using the percentage of completion method;
- Delay in the completion and delivery of IP products in development as to which customers have paid for early access;
- Customer contract amendments or renewals that provide discounts or defer revenue to later periods; and
- The levels of our hardware and IP revenues, which are recognized upfront and are primarily dependent upon our ability to provide the latest technology and meet customer requirements.

These factors, or any other factors or risks discussed herein, could negatively impact our revenue or earnings and cause our stock price to decline. Additionally, our results may fail to meet or exceed the expectations of securities analysts and investors, or such analysts may change their recommendation regarding our stock, which could cause our stock price to decline. Our stock price has been, and may continue to be, volatile, which may make it more difficult for our stockholders to sell their shares at a time or a price that is favorable to them.

Cybersecurity threats or other security breaches could compromise sensitive information belonging to us or our customers and could harm our business and our reputation, particularly that of our security testing solutions.

We store sensitive data, including intellectual property, our proprietary business information and that of our customers, and confidential employee information, in our data centers, on our networks, or on the cloud. Despite our security measures, our information technology and infrastructure may be vulnerable to attacks by hackers or breached due to employee error, malfeasance or other disruptions that could result in unauthorized disclosure or loss of sensitive information. As a result of the COVID-19 pandemic and shelter-in-place orders, most of our employees in affected areas are working remotely, which magnifies the importance of the integrity of our remote access security measures.

For example, we discovered unauthorized third-party access to our products and product license files hosted on our SolvNet customer license and product delivery system in 2015. While we identified and remediated the incident, it is possible that our security measures may be circumvented again in the future, and any such breach could harm our business and reputation. The techniques used to obtain unauthorized access to networks, or to sabotage systems, change frequently and generally are not recognized until launched against a target. We may be unable to anticipate these techniques or to implement adequate preventative measures. Furthermore, in the operation of our business we also use third-party vendors that store certain sensitive data, including confidential information about our employees, and these third parties are subject to their own cybersecurity threats. While our standard vendor terms and conditions include provisions requiring the use of appropriate security measures to prevent unauthorized use or disclosure of our data, as well as other safeguards, a breach may still occur. In addition, if we select a vendor that uses cloud storage of information as part of their service or product offerings, or if we are selected as a vendor for our cloud-based solutions, our proprietary information could be misappropriated by third parties despite our attempts to validate the security of such services. Any security breach of our own or a third-party vendor's systems could cause us to be non-compliant with applicable laws or regulations, subject us to legal claims or proceedings, disrupt our operations, damage our reputation, and cause a loss of confidence in our products and services, any of which could adversely affect our business.

Our software products, our hosted solutions as well as our software security and quality testing solutions, may also be vulnerable to cyber attacks. An attack could disrupt the proper functioning of our software, cause errors in the output of our customers' work, allow unauthorized access to our or our customers' proprietary information, or cause other destructive outcomes. As a result, our reputation could suffer, customers could stop buying our products, we could face lawsuits and potential liability, and our financial performance could be negatively impacted.

We offer software security and quality testing solutions. If we fail to identify new and increasingly sophisticated methods of cyber attacks, or fail to invest sufficient resources in research and development regarding new threat vectors, our security testing products and services may fail to detect vulnerabilities in our customers' software code. An actual or perceived failure to identify security flaws may harm the perceived reliability of our security testing products and services, and could result in a loss of customers or sales, or an increased cost to remedy a problem. Furthermore, our growth and recent acquisitions in the software security and quality testing space may increase our visibility as a security-focused company and may make us a more attractive target for attacks on our own information technology infrastructure. Successful attacks could damage our reputation as a security-focused company.

If we fail to protect our proprietary technology, our business will be harmed.

Our success depends in part upon protecting our proprietary technology. Our efforts to protect our technology may be costly and unsuccessful. We rely on agreements with customers, employees and other third-parties as well as intellectual property laws worldwide to protect our proprietary technology. These agreements may be breached, and we may not have adequate remedies for any breach. Additionally, despite our measures to prevent piracy, other parties may attempt to illegally copy or use our products, which could result in lost revenue if their efforts are successful. Some foreign countries do not currently provide effective legal protection for intellectual property and our ability to prevent the unauthorized use of our products in those countries is therefore limited. Our trade secrets may also be stolen, otherwise become known, or be independently developed by competitors.

From time to time, we may need to commence litigation or other legal proceedings in order to:

- Assert claims of infringement of our intellectual property;
- Defend our products from piracy;
- Protect our trade secrets or know-how; or
- Determine the enforceability, scope and validity of the propriety rights of others.

If we do not obtain or maintain appropriate patent, copyright or trade secret protection, for any reason, or cannot fully defend our intellectual property rights in certain jurisdictions, our business and operating results would be harmed. In addition, intellectual property litigation is lengthy, expensive and uncertain. Legal fees related to such litigation will increase our operating expenses and may reduce our net income.

We may not be able to realize the potential financial or strategic benefits of the acquisitions we complete, or find suitable target businesses and technology to acquire, which could hurt our ability to grow our business, develop new products or sell our products.

Acquisitions and strategic investments are an important part of our growth strategy. We have completed a significant number of acquisitions in recent years. We expect to make additional acquisitions and strategic investments in the future, but we may not find suitable acquisition or investment targets or we may not be able to consummate desired acquisitions or investments due to unfavorable credit markets, commercially unacceptable terms or other risks, which could harm our operating results. Acquisitions and strategic investments are difficult, time-consuming, and pose a number of risks, including:

- Potential negative impact on our earnings per share;
- Failure of acquired products to achieve projected sales;
- Problems in integrating the acquired products with our products;
- Difficulties entering into new markets in which we are not experienced or where competitors may have stronger positions;
- Potential downward pressure on operating margins due to lower operating margins of acquired businesses, increased headcount costs and other expenses associated with adding and supporting new products;
- Difficulties in retaining and integrating key employees;
- Substantial reductions of our cash resources and/or the incurrence of debt;
- Failure to realize expected synergies or cost savings;
- Difficulties in integrating or expanding sales, marketing and distribution functions and administrative systems, including information technology and human resources systems;
- Dilution of our current stockholders through the issuance of common stock as part of the merger consideration;
- Difficulties in negotiating, governing and realizing value from strategic investments;
- Assumption of unknown liabilities, including tax and litigation, and the related expenses and diversion of resources;
- Disruption of ongoing business operations, including diversion of management’s attention and uncertainty for employees and customers, particularly during the post-acquisition integration process;
- Potential negative impacts on our relationships with customers, distributors and business partners;
- Exposure to new operational risks, regulations, and business customs to the extent acquired businesses are located in regions where we are not currently conducting business;
- The need to implement controls, processes and policies appropriate for a public company at acquired companies that may have previously lacked such controls, processes and policies;
- Negative impact on our net income resulting from acquisition or investment-related costs; and
- Requirements imposed by government regulators in connection with their review of an acquisition, including required divestitures or restrictions on the conduct of our business or the acquired business.

If we do not manage the foregoing risks, the acquisitions or strategic investments that we complete may have an adverse effect on our business and financial condition.

We pursue new product and technology initiatives from time to time, and if we fail to successfully carry out these initiatives, our business, financial condition, or results of operations could be adversely impacted.

As part of the evolution of our business, we have made substantial investments to develop new products and enhancements to existing products through our acquisitions and research and development efforts. If we are unable to anticipate technological changes in our industry by introducing new or enhanced products in a timely and cost-effective manner, or if we fail to introduce products that meet market demand, we may lose our competitive position, our products may become obsolete, and our business, financial condition or results of operations could be adversely affected.

Additionally, from time to time, we may invest in efforts to expand into adjacent markets, including, for example, software security and quality testing solutions. Although we believe these solutions are complementary to our EDA tools, we have less experience and a more limited operating history in offering software quality testing and security products and services, and our efforts in this area may not be successful. Our success in these and other new markets depends on a variety of factors, including the following:

- Our ability to attract a new customer base, including in industries in which we have less experience;
- Our successful development of new sales and marketing strategies to meet customer requirements;
- Our ability to accurately predict, prepare for and promptly respond to technological developments in new fields, including, in the case of our software quality testing and security tools and services, identifying new security vulnerabilities in software code and ensuring support for a growing number of programming languages;
- Our ability to compete with new and existing competitors in these new industries, many of which may have more financial resources, industry experience, brand recognition, relevant intellectual property rights or established customer relationships than we currently do, and could include free and open source solutions that provide similar software quality testing and security tools without fees;
- Our ability to skillfully balance our investment in adjacent markets with investment in our existing products and services;
- Our ability to attract and retain employees with expertise in new fields;
- Our ability to sell and support consulting services at profitable margins; and
- Our ability to manage our revenue model in connection with hybrid sales of licensed products and consulting services.

Difficulties in any of our new product development efforts or our efforts to enter adjacent markets, including delays or disruptions as a result of the COVID-19 pandemic, could adversely affect our operating results and financial condition.

We may have to invest more resources in research and development than anticipated, which could increase our operating expenses and negatively affect our operating results.

We devote substantial resources to research and development. New competitors, technological advances in the semiconductor industry or by competitors, our acquisitions, our entry into new markets or other competitive factors may require us to invest significantly greater resources than we anticipate. If we are required to invest significantly greater resources than anticipated without a corresponding increase in revenue, our operating results could decline. Additionally, our periodic research and development expenses may be independent of our level of revenue, which could negatively impact our financial results. Finally, there can be no guarantee that our research and development investments will result in products that create additional revenue.

Product errors or defects could expose us to liability and harm our reputation and we could lose market share.

Software products frequently contain errors or defects, especially when first introduced, when new versions are released, or when integrated with technologies developed by acquired companies. Product errors, including those resulting from third-party suppliers, could affect the performance or interoperability of our products, could delay the development or release of new products or new versions of products and could adversely affect market acceptance or perception of our products. In addition, any allegations of manufacturability issues resulting from use of our IP products could, even if untrue, adversely affect our reputation and our customers' willingness to license IP products from us. Any such errors or delays in releasing new products or new versions of products or allegations of unsatisfactory performance could cause us to lose customers, increase our service costs, subject us to liability for damages and divert our resources from other tasks, any one of which could materially and adversely affect our business and operating results.

Our hardware products, which primarily consist of prototyping and emulation systems, subject us to distinct risks.

The growth in sales of our hardware products subjects us to several risks, including:

- Increased dependence on a sole supplier for certain hardware components, which may reduce our control over product quality and pricing and may lead to delays in production and delivery of our hardware products, should our supplier fail to deliver sufficient quantities of acceptable components in a timely fashion;
- Increasingly variable revenue and less predictable revenue forecasts, due to fluctuations in hardware revenue, which is recognized upfront upon shipment, as opposed to most sales of software products for which revenue is recognized over time;
- Potential reductions in overall margins, as the gross margin for our hardware products is typically lower than those of our software products;
- Longer sales cycles, which create risks of insufficient, excess or obsolete inventory and variations in inventory valuation, which can adversely affect our operating results;
- Decreases or delays in customer purchases in favor of next-generation releases, which may lead to excess or obsolete inventory or require us to discount our older hardware products;
- Longer warranty periods than those of our software products, which may require us to replace hardware components under warranty, thus increasing our costs; and
- Potential impacts on our supply chain, including due to the effects of the COVID-19 pandemic and a sustained global semiconductor shortage.

Liquidity requirements in our U.S. operations may require us to raise cash in uncertain capital markets, which could negatively affect our financial condition.

As of July 31, 2021, approximately 44% of our worldwide cash and cash equivalents balance is held by our international subsidiaries. We intend to meet our U.S. cash spending needs primarily through our existing U.S. cash balances, ongoing U.S. cash flows, and available credit under our term loan and revolving credit facilities. Should our cash spending needs in the U.S. rise and exceed these liquidity sources, due to the impact of the COVID-19 pandemic or otherwise, we may be required to incur additional debt at higher than anticipated interest rates or access other funding sources, which could negatively affect our results of operations, capital structure or the market price of our common stock.

From time to time we are subject to claims that our products infringe on third-party intellectual property rights.

We are from time to time subject to claims alleging our infringement of third-party intellectual property rights, including patent rights. Under our customer agreements and other license agreements, we agree in many cases to indemnify our customers if our products infringe a third party's intellectual property rights. Infringement claims can result in costly and time-consuming litigation, require us to enter into royalty arrangements, subject us to damages or injunctions restricting our sale of products, invalidate a patent or family of patents, require us to refund license fees to our customers or to forgo future payments or require us to redesign certain of our products, any one of which could harm our business and operating results.

We may not be able to continue to obtain licenses to third-party software and intellectual property on reasonable terms or at all, which may disrupt our business and harm our financial results.

We license third-party software and other intellectual property for use in product research and development and, in several instances, for inclusion in our products. We also license third-party software, including the software of our competitors, to test the interoperability of our products with other industry products and in connection with our professional services. These licenses may need to be renegotiated or renewed from time to time, or we may need to obtain new licenses in the future. Third parties may stop adequately supporting or maintaining their technology, or they or their technology may be acquired by our competitors. If we are unable to obtain licenses to these third-party software and intellectual property on reasonable terms or at all, we may not be able to sell the affected products, our customers' use of the products may be interrupted, or our product development processes and professional services offerings may be disrupted, which could in turn harm our financial results, our customers, and our reputation.

The inclusion of third-party intellectual property in our products can also subject us and our customers to infringement claims. Although we seek to mitigate this risk contractually, we may not be able to sufficiently limit our potential liability. Regardless of outcome, infringement claims may require us to use significant resources and may divert management's attention.

Some of our products and technology, including those we acquire, may include software licensed under open source licenses. Some open source licenses could require us, under certain circumstances, to make available or grant licenses to any modifications or derivative works we create based on the open source software. Although we have tools and processes to monitor and restrict our use of open source software, the risks associated with open source usage may not be eliminated and may, if not properly addressed, result in unanticipated obligations that harm our business.

If we fail to timely recruit and retain senior management and key employees, our business may be harmed.

We depend in large part upon the services of key members of our senior management team to drive our future success. If we were to lose the services of any member of our senior management team, our business could be adversely affected. To be successful, we must also attract and retain key technical, sales and managerial employees, including those who join us in connection with acquisitions. There are a limited number of qualified EDA and IC design engineers, and competition for these individuals is intense and has increased. Our employees are often recruited aggressively by our competitors and our customers. Any failure to recruit and retain key technical, sales and managerial employees could harm our business, results of operations and financial condition, and our recruiting and retention efforts may be negatively impacted by restrictions on travel and business activity due to the COVID-19 pandemic. Additionally, efforts to recruit and retain qualified employees could be costly and negatively impact our operating expenses.

We issue equity awards from employee equity plans as a key component of our overall compensation. We face pressure to limit the use of such equity-based compensation due to its dilutive effect on stockholders. If we are unable to grant attractive equity-based packages in the future, it could limit our ability to attract and retain key employees.

In preparing our financial statements we make certain assumptions, judgments and estimates that affect amounts reported in our consolidated financial statements, which, if not accurate, may significantly impact our financial results.

We make assumptions, judgments and estimates for a number of items, including the fair value of financial instruments, goodwill, long-lived assets and other intangible assets, the realizability of deferred tax assets, the recognition of revenue and the fair value of stock awards. We also make assumptions, judgments and estimates in determining the accruals for employee-related liabilities, including commissions and variable compensation, and in determining the accruals for uncertain tax positions, valuation allowances on deferred tax assets, allowances for doubtful accounts, and legal contingencies. These assumptions, judgments and estimates are drawn from historical experience and various other factors that we believe are reasonable under the circumstances as of the date of the consolidated financial statements. Actual results could differ materially from our estimates, and such differences could significantly impact our financial results. In addition, we cannot predict the full impact of the COVID-19 pandemic on our business operations. The uncertainty affects management's estimates and assumptions, which could result in greater variability in a variety of areas that depend on these estimates and assumptions.

Legal and Regulatory Risks

Changes in United States Generally Accepted Accounting Principles (U.S. GAAP) could adversely affect our financial results and may require significant changes to our internal accounting systems and processes.

We prepare our consolidated financial statements in conformity with U.S. GAAP. These principles are subject to interpretation by the Financial Accounting Standards Board (FASB), the SEC and various bodies formed to interpret and create appropriate accounting principles and guidance.

The FASB periodically issues new accounting standards on a variety of topics, including, for example, revenue recognition and accounting for leases. These and other such standards generally result in different accounting principles, which may significantly impact our reported results or could result in variability of our financial results. For example, the new revenue recognition standard became applicable to us at the beginning of fiscal 2019 and there is an increased volatility in our total revenue with less predictability than under the prior accounting standard.

Our results could be adversely affected by a change in our effective tax rate as a result of tax law changes and related new or revised guidance and regulations, changes in our geographical earnings mix, unfavorable government reviews of our tax returns, material differences between our forecasted and actual annual effective tax rates, future changes to our tax structure, or by evolving enforcement practices.

Our operations are subject to income and transaction taxes in the United States and in multiple foreign jurisdictions. Because we have a wide range of statutory tax rates in the multiple jurisdictions in which we operate, any changes in our geographical earnings mix, including those resulting from our intercompany transfer pricing or from changes in the rules governing transfer pricing, could materially impact our effective tax rate. Furthermore, a change in the tax law of the jurisdictions where we do business, including an increase in tax rates, an adverse change in the treatment of an item of income or expense or limitations on our ability to utilize tax credits, could result in a material increase in our tax expense and impact our financial position and cash flows. For example, in response to the fiscal impact of the COVID-19 pandemic, the State of California enacted legislation on June 29, 2020 that would suspend the use of certain corporate research and development tax credits for a three-year period beginning in our fiscal 2021, which resulted in an impact in our tax expense.

On December 22, 2017, the President of the United States signed into law the Tax Cuts and Jobs Act (Tax Act), which significantly changed prior U.S. tax law and includes numerous provisions that affect our business. The Tax Act includes certain new provisions that began to affect our income from foreign operations in the first quarter of fiscal 2019. Further, President Biden has proposed The American Jobs Act and various bills have been introduced by members of the House of Representatives and the Senate proposing changes to the corporate tax rate as well as other provisions. On August 9, 2021 the Senate released the fiscal 2022 budget resolution with reconciliation instructions for a potential $3.5 trillion spending bill, which is expected to be paid for through a mix of corporate and individual tax increases. As we gather more information and perform more analysis, our results may materially differ from previous estimates, and those differences may materially affect our financial position. Accounting for certain of these provisions requires the exercise of significant judgment.

Further changes in the tax laws of foreign jurisdictions could arise as a result of the *Programme of Work to Develop a Concensus Solution to the Tax Challenges Arising from the Digitalization of the Economy (Programme of Work)* agreement by the Organisation for Economic Co-operation and Development, which represents a coalition of member countries, including the United States. The *Programme of Work* is evaluating potential changes to numerous long-standing tax principles. These changes, if enacted, by various countries in which we do business may increase our taxes in these countries. Changes to these and other areas in relation to international tax reform, including future actions taken by foreign governments in response to the Tax Act, could increase uncertainty and may adversely affect our tax rate and cash flow in future years.

Our income and non-income tax filings are subject to review or audit by the Internal Revenue Service and state, local and foreign taxing authorities. We exercise significant judgment in determining our worldwide provision for income taxes and, in the ordinary course of our business, there may be transactions and calculations where the ultimate tax determination is uncertain. We may also be liable for potential tax liabilities of businesses we acquire, including future taxes payable related to the transition tax on earnings from their foreign operations, if any, under the Tax Act. Although we believe our tax estimates are reasonable, the final determination in an audit may be materially different than the treatment reflected in our historical income tax provisions and accruals. An assessment of additional taxes because of an audit could adversely affect our income tax provision and net income in the periods for which that determination is made.

In July 2017, the HTA issued a final assessment against Synopsys Hungary for fiscal years 2011 through 2013. The HTA has applied withholding taxes on certain payments made to affiliates, resulting in an aggregate tax assessment of approximately $25.0 million and interest and penalties of $11.0 million. We paid the tax assessments, penalties and interest in the first quarter of fiscal 2018 as required by law and recorded these amounts as prepaid taxes on our balance sheet. On April 30, 2019, the Administrative Court ruled against Synopsys Hungary. We filed an appeal with the Hungarian Supreme Court on July 5, 2019. The Hungarian Supreme Court heard our appeal on November 12, 2020 and remanded the case to the Hungarian Administrative Court for further proceedings. We received the Hungarian Supreme Court's written decision in the first quarter of fiscal 2021. On April 27, 2021, the Administrative Court reheard the case and again ruled against Synopsys Hungary. We received the written opinion from the Administrative Court on May 19, 2021 and filed an appeal with the Hungarian Supreme Court on July 19, 2021. For further discussion of the Hungary audit, see Note 17 of Notes to Unaudited Condensed Consolidated Financial Statements under the heading "Non-U.S. Examinations."

We maintain significant deferred tax assets related to certain tax credits. Our ability to use these credits is dependent upon having sufficient future taxable income in the relevant jurisdiction and in the case of foreign tax credits, how such credits are treated under provisions of the Tax Act. Changes in our forecasts of future income could result in an adjustment to the deferred tax asset and a related charge to earnings that could materially affect our financial results.

We may be subject to litigation proceedings that could harm our business.

We may be subject to legal claims or regulatory matters involving stockholder, consumer, employment, customer, supplier, competition and other issues on a global basis. Litigation is subject to inherent uncertainties, and unfavorable rulings could occur. An unfavorable ruling could include monetary damages or, in cases for which injunctive relief is sought, an injunction prohibiting us from manufacturing or selling one or more products. If we were to receive an unfavorable ruling on a matter, our business and results of operations could be materially harmed. Further information regarding certain of these matters is contained in Part II, Item 1, Legal Proceedings.

Our business is subject to evolving corporate governance and public disclosure regulations that have increased both our compliance costs and the risk of noncompliance, which could have an adverse effect on our stock price.

We are subject to changing rules and regulations promulgated by a number of governmental and self-regulatory organizations, including the SEC, the Nasdaq Stock Market and the FASB. These rules and regulations continue to evolve in scope and complexity and many new requirements have been created in response to laws enacted by Congress, making compliance more difficult and uncertain. For example, our efforts to comply with the Dodd-Frank Wall Street Reform and Consumer Protection Act and other regulations, including "conflict minerals" regulations affecting our hardware products, have resulted in, and are likely to continue to result in, increased general and administrative expenses and a diversion of management time and attention from revenue-generating activities to compliance activities.

There are inherent limitations on the effectiveness of our controls and compliance programs.

Regardless of how well designed and operated it is, a control system can provide only reasonable assurance that its objectives will be met. Further, the design of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their costs. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, have been detected. Moreover, although we have implemented compliance programs and compliance training for employees, such measures may not prevent our employees, contractors or agents from breaching or circumventing our policies or violating applicable laws and regulations. Failure of our control systems and compliance programs to prevent error, fraud or violations of law could have a material adverse impact on our business.

Our investment portfolio may be impaired by any deterioration of capital markets.

From time to time, our cash equivalent and short-term investment portfolio consists of investment-grade U.S. government agency securities, asset-backed securities, corporate debt securities, commercial paper, certificates of deposit, money market funds, municipal securities and other securities and bank deposits. Our investment portfolio carries both interest rate risk and credit risk and may be negatively impacted by the economic effects of the COVID-19 pandemic. Fixed rate debt securities may have their market value adversely impacted due to a credit downgrade or a rise in interest rates, while floating rate securities may produce less income than expected if interest rates fall or a credit downgrade occurs. As a result of capital pressures on certain banks, especially in Europe, and the continuing low interest rate environment, some of our financial instruments may become impaired.

Our future investment income may fall short of expectations due to changes in interest rates or if the decline in fair value of investments held by us is judged to be other-than-temporary. In addition, we may suffer losses in principal if we are forced to sell securities that decline in market value due to changes in the issuer's credit quality or changes in interest rates.

General Risks

Catastrophic events may disrupt our business and harm our operating results.

Due to the global nature of our business, our operating results may be negatively impacted by catastrophic events throughout the world. We rely on a global network of infrastructure applications, enterprise applications and technology systems for our development, marketing, operational, support and sales activities. A disruption or failure of these systems in the event of a major earthquake, fire, telecommunications failure, cybersecurity attack, terrorist attack, epidemic or pandemic (including the COVID-19 pandemic), or other catastrophic event could cause system interruptions, delays in our product development and loss of critical data and could prevent us from fulfilling our customers' orders. In particular, our sales and infrastructure are vulnerable to regional or worldwide health conditions, including the effects of the outbreak of contagious diseases such as the COVID-19 pandemic. Moreover, our corporate headquarters, a significant portion of our research and development activities, our data centers, and certain other critical business operations are located in California, near major earthquake faults and sites of recent historic wildfires. A catastrophic event that results in the destruction or disruption of our data centers or our critical business or information technology systems would severely affect our ability to conduct normal business operations and, as a result, our operating results would be adversely affected.

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

In June 2021, we entered into an accelerated share repurchase agreement (the June 2021 ASR) to repurchase an aggregate of $175.0 million of our common stock. Pursuant to the June 2021 ASR, we made a prepayment of $175.0 million to receive initial deliveries of shares valued at $140.0 million. The remaining balance of $35.0 million was settled in August 2021. Total shares purchased under the June 2021 ASR were approximately 0.6 million shares at an average purchase price of $282.13 per share.

The table below sets forth information regarding our repurchases of our common stock during the three months ended July 31, 2021:

Period [1]	Total number of shares purchased [2]	Average price paid per share [2]	Total number of shares purchased as part of publicly announced programs	Maximum approximate dollar value of shares that may yet be purchased under the programs[1]
Month #1				
May 2, 2021 through June 5, 2021	—	$ —	—	$ 59,839,990
Month #2				
June 6, 2021 through July 3, 2021	520,717	$ 268.86	520,717	$ 325,000,000
Month #3				
July 4, 2021 through July 31, 2021	—	$ —	—	$ 325,000,000
Total	520,717	$ 268.86	520,717	$ 325,000,000

[1] As of July 31, 2021, $325.0 million remained available for future repurchases under the program.

[2] Amounts are calculated based on the settlement date.

See Note 12 of Notes to Unaudited Condensed Consolidated Financial Statements for further information regarding our stock repurchase program.

Item 6. *Exhibits*

Exhibit Number	Exhibit Description	Incorporated By Reference				Filed Herewith
		Form	File No.	Exhibit	Filing Date	
3.1	Amended and Restated Certificate of Incorporation	10-Q	000-19807	3.1	9/15/2003	
3.2	Amended and Restated Bylaws	10-K	000-19807	3.2	12/15/2020	
4.1	Specimen Common Stock Certificate	S-1	33-45138	4.3	2/24/1992 (effective date)	
31.1	Certification of Co-Chief Executive Officer pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Exchange Act					X
31.2	Certification of Co-Chief Executive Officer pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Exchange Act					X
31.3	Certification of Chief Financial Officer pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Exchange Act					X
32.1	Certification of Co-Chief Executive Officers and Chief Financial Officer furnished pursuant to Rule 13a-14(b) or Rule 15d-14(b) of the Exchange Act and Section 1350 of Chapter 63 of Title 18 of the United States Code					X
101.INS	Inline XBRL Instance Document					X
101.SCH	Inline XBRL Taxonomy Extension Schema Document					X
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document					X
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document					X
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document					X
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document					X
104	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101)					

SIGNATURES

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.

SYNOPSYS, INC.

Date: August 20, 2021	By:	/s/ TRAC PHAM
		Trac Pham **Chief Financial Officer** **(Principal Financial Officer)**

Exhibit 31.1

CERTIFICATION

I, Aart J. de Geus, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Synopsys, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officers and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officers and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 20, 2021

/s/ Aart J. de Geus

Aart J. de Geus
Co-Chief Executive Officer and Chairman
(Co-Principal Executive Officer)

Exhibit 31.2

CERTIFICATION

I, Chi-Foon Chan, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Synopsys, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officers and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officers and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 20, 2021

/s/ Chi-Foon Chan

Chi-Foon Chan
Co-Chief Executive Officer and President
(Co-Principal Executive Officer)

Exhibit 31.3

CERTIFICATION

I, Trac Pham, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Synopsys, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant’s other certifying officers and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
   (c) Evaluated the effectiveness of the registrant’s disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
   (d) Disclosed in this report any change in the registrant’s internal control over financial reporting that occurred during the registrant’s most recent fiscal quarter (the registrant’s fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant’s internal control over financial reporting; and

5. The registrant’s other certifying officers and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant’s auditors and the audit committee of the registrant’s board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant’s ability to record, process, summarize and report financial information; and
   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant’s internal control over financial reporting.

Date: August 20, 2021

/s/ Trac Pham

Trac Pham
Chief Financial Officer
(Principal Financial Officer)

Exhibit 32.1

Certification Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (Subsections (a) and (b) of Section 1350, Chapter 63 of Title 18, United States Code)

Pursuant to the requirement set forth in Rule 13a-14(b) of the Securities Exchange Act of 1934, as amended (the “Exchange Act”) and Section 1350, Chapter 63 of Title 18 of the United States Code (18 U.S.C-§1350), each of Aart J. de Geus, Co-Chief Executive Officer and Chairman of Synopsys, Inc., a Delaware corporation (the “Company”), Chi-Foon Chan, Co-Chief Executive Officer and President of the Company, and Trac Pham, Chief Financial Officer of the Company, does hereby certify, to such officer’s knowledge that:

The Quarterly Report on Form 10-Q for the fiscal quarter ended July 31, 2021 (the “Form 10-Q”) to which this Certification is attached as Exhibit 32.1 fully complies with the requirements of Section 13(a) or 15(d) of the Exchange Act. The information contained in the Form 10-Q fairly presents, in all material respects, the financial condition and results of operations of the Company.

IN WITNESS WHEREOF, the undersigned have set their hands hereto as of August 20, 2021.

/s/ Aart J. de Geus

Aart J. de Geus
Co-Chief Executive Officer and Chairman

/s/ Chi-Foon Chan

Chi-Foon Chan
Co-Chief Executive Officer and President

/s/ Trac Pham

Trac Pham
Chief Financial Officer

The foregoing certification is being furnished solely pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (subsections (a) and (b) of Section 1350, Chapter 63 of Title 18, United States Code) and is not deemed filed with the Securities and Exchange Commission as part of the Form 10-Q or as a separate disclosure document and is not to be incorporated by reference into any filing of the Company under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended (whether made before or after the date of the Form 10-Q), irrespective of any general incorporation language contained in such filing.