

Share-Based Compensation

The following table shows a summary of share-based compensation expense included in the Consolidated Statements of Operations during the periods presented (in thousands):

	Fiscal Years		
	2019	2018	2017
Cost of revenue	\$ 2,936	\$ 3,869	\$ 3,189
Research and development	8,551	13,448	10,565
Selling, general and administrative	12,305	14,620	22,581
Total	\$ 23,792	\$ 31,937	\$ 36,335

Amounts presented above include share-based compensation expense of \$0.8 million for fiscal year 2017, which is recorded as discontinued operations related to employees of our Compute business.

As of September 27, 2019, the total unrecognized compensation costs related to outstanding stock options, restricted stock awards and units including awards with time-based, performance-based, and market-based vesting was \$47.0 million, which we expect to recognize over a weighted-average period of 2.9 years.

Stock Options

A summary of stock option activity for fiscal year 2019 is as follows (in thousands, except per share amounts and contractual term):

	Number of Shares	Weighted-Average Exercise Price per Share	Weighted-Average Remaining Contractual Term (in Years)	Aggregate Intrinsic Value
Options outstanding - September 28, 2018	1,408	\$ 32.05		
Granted	585	15.44		
Exercised	(119)	13.48		
Forfeited, canceled or expired	(1,497)	31.68		
Options outstanding - September 27, 2019	376	\$ 13.58	7.03	\$ 3,046
Options vested and expected to vest - September 27, 2019	376	\$ 13.58	7.03	\$ 3,046
Options exercisable - September 27, 2019	91	\$ 9.82	2.48	\$ 1,081

Aggregate intrinsic value represents the difference between our closing stock price on September 27, 2019, and the exercise price of outstanding, in-the-money options. The total intrinsic value of options exercised was \$0.7 million, \$0.9 million and \$8.9 million for fiscal years 2019, 2018 and 2017, respectively.

Stock Options with Time-based Vesting Criteria

In November 2017, we granted 10,924 incentive stock options and 69,076 non-qualified stock options with a total grant date fair value of \$17.55 per share, or \$1.4 million. These stock options were valued using a Black-Scholes model, using a volatility rate of 45.7%, a risk-free rate of 2.21%, a strike price of \$36.61 and an expected term of 6.5 years. Share-based compensation expense is recognized on a straight-line basis over the service period which approximated 4.5 years for these awards. These awards were included in the cancellation during the fiscal first quarter of 2019 as discussed in the section below.

Stock Options with Market-based Vesting Criteria

We grant NQs that are subject to vesting only upon the market price of our underlying public stock closing above a certain price target within seven years of the date of grant. Share-based compensation expense is recognized regardless of the number of awards that are earned based on the market condition and is recognized on a straight-line basis over the estimated service period of approximately three years. If the required service period is not met for these options, then the share-based compensation expense would be reversed. In the event that our common stock achieves the target price per share based on a 30-day trailing average prior to the end of the estimated service period, any remaining unamortized compensation cost will be recognized.

Stock options with market-based vesting criteria granted for fiscal years 2019, 2018 and 2017 were 585,000, 325,000 and 320,000, respectively, at weighted average grant date fair values of \$7.47, \$15.52 and \$13.18 per share, or total grant date fair value \$2.4 million, \$5.0 million and \$4.3 million, respectively.