

Liaison in Fiscal 2019, as well as Hightail, Guidance Software Inc. (Guidance), and Covisint Corporation (Covisint), which were acquired during Fiscal 2018.

Operating Expenses

(In thousands)	Year Ended June 30,				
	2019	Change increase (decrease)	2018	Change increase (decrease)	2017
Research and development	\$ 321,836	\$ (1,073)	\$ 322,909	\$ 41,694	\$ 281,215
Sales and marketing	518,035	(11,106)	529,141	84,687	444,454
General and administrative	207,909	2,682	205,227	34,874	170,353
Depreciation	97,716	10,773	86,943	22,625	64,318
Amortization of acquired customer-based intangible assets	189,827	5,709	184,118	33,276	150,842
Special charges (recoveries)	35,719	6,508	29,211	(34,407)	63,618
Total operating expenses	\$ 1,371,042	\$ 13,493	\$ 1,357,549	\$ 182,749	\$ 1,174,800

<u>% of Total Revenues:</u>			
Research and development	11.2%	11.5%	12.3%
Sales and marketing	18.1%	18.8%	19.4%
General and administrative	7.2%	7.3%	7.4%
Depreciation	3.4%	3.1%	2.8%
Amortization of acquired customer-based intangible assets	6.6%	6.5%	6.6%
Special charges (recoveries)	1.2%	1.0%	2.8%

Research and development expenses consist primarily of payroll and payroll-related benefits expenses, contracted research and development expenses, and facility costs. Research and development assists with organic growth and improves product stability and functionality, and accordingly, we dedicate extensive efforts to update and upgrade our product offerings. The primary driver is typically budgeted software upgrades and software development.

(In thousands)	Change between Fiscal increase (decrease)	
	2019 and 2018	2018 and 2017
Payroll and payroll-related benefits	\$ 12,629	\$ 39,119
Contract labour and consulting	(6,791)	(3,899)
Share-based compensation	(385)	(1,490)
Travel and communication	(588)	(343)
Facilities	(4,775)	7,834
Other miscellaneous	(1,163)	473
Total change in research and development expenses	\$ (1,073)	\$ 41,694

Research and development expenses decreased by \$1.1 million during the year ended June 30, 2019 as compared to the prior fiscal year. This was primarily due to a reduction in contract labour and consulting of \$6.8 million and a reduction in the use of facility and related expenses of \$4.8 million, partially offset by an increase in payroll and payroll-related benefits of \$12.6 million. The increase in payroll and payroll-related benefits was driven primarily by increased headcount from recent acquisitions. Overall, our research and development expenses, as a percentage of total revenues, remained stable at approximately 11% compared to prior fiscal year.

Our research and development labour resources increased by 336 employees, from 3,331 employees at June 30, 2018 to 3,667 employees at June 30, 2019.