

# Technology Economics: The Cost Effectiveness of Mainframe Computing

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# Computational Intensity (MIPS and Servers) by Sector

The average organization has a computational platform of .37 Installed MIPS and .17 Servers (Physical) per \$1M of Revenue. Using Gartner 2010 average costs per MIPS and per Physical Server, this equates to an average enterprise expense of \$3,382 per \$1M of Revenue.

Financial Services is the most computationally intense sector as measured by Installed MIPS and Physical Servers at 1.07 and .46 respectively at a cost of \$9,574; Education is the least at .13 and .05 respectively at a cost of \$1,102.

	Sector Averages n=133 companies		Cost per MIPS (Source: Gartner 2010 Key Metrics)	Cost per Server (Source: 2010 Gartner Key Metrics)	Compute Cost (MIPS + Server Cost) per \$1M Revenue
	MIPS per \$1M Revenue	Servers per \$1M Revenue			
<b>Banking</b>	0.98	0.39	\$ 4,445	\$ 10,473	\$ 8,441
<b>Consumer Products</b>	0.19	0.16	\$ 4,445	\$ 10,473	\$ 2,520
<b>Education</b>	0.13	0.05	\$ 4,445	\$ 10,473	\$ 1,102
<b>Electronics</b>	0.25	0.11	\$ 4,445	\$ 10,473	\$ 2,263
<b>Financial Services</b>	1.07	0.46	\$ 4,445	\$ 10,473	\$ 9,574
<b>Food &amp; Beverage Processing</b>	0.18	0.12	\$ 4,445	\$ 10,473	\$ 2,057
<b>Government - Federal</b>	0.49	0.12	\$ 4,445	\$ 10,473	\$ 3,382
<b>Government - State &amp; Local</b>	0.38	0.09	\$ 4,445	\$ 10,473	\$ 2,632
<b>Health Care</b>	0.19	0.13	\$ 4,445	\$ 10,473	\$ 2,206
<b>Insurance</b>	0.33	0.16	\$ 4,445	\$ 10,473	\$ 3,143
<b>Manufacturing</b>	0.21	0.12	\$ 4,445	\$ 10,473	\$ 2,190
<b>Metals &amp; Natural Resources</b>	0.16	0.12	\$ 4,445	\$ 10,473	\$ 1,968
<b>Professional Services</b>	0.14	0.08	\$ 4,445	\$ 10,473	\$ 1,460
<b>Telecommunications</b>	0.85	0.25	\$ 4,445	\$ 10,473	\$ 6,397
<b>Transportation</b>	0.23	0.21	\$ 4,445	\$ 10,473	\$ 3,222
<b>Utilities</b>	0.16	0.08	\$ 4,445	\$ 10,473	\$ 1,549
<b>Cross Industry Average</b>	0.37	0.17	\$ 4,445	\$ 10,473	\$ 3,382

# Computation Platform Costs for the \$10B Enterprise

A \$10B cross sector average company would require 3,713 Installed MIPS and 1,653 Physical Servers to support its business at an annual cost of \$33.8M. In contrast, a \$10B Financial Servers firm would require 10,700 Installed MIPS and 4,600 Physical Servers at an annual cost of \$95.7M

	Platform Size and Costs to Support \$10B Revenue		
	MIPS	Servers	Platform Cost at Gartner 2010 Benchmark Unit Costs
<b>Banking</b>	9,800	3,900	\$ 84,405,700
<b>Consumer Products</b>	1,900	1,600	\$ 25,202,300
<b>Education</b>	1,300	500	\$ 11,015,000
<b>Electronics</b>	2,500	1,100	\$ 22,632,800
<b>Financial Services</b>	10,700	4,600	\$ 95,737,300
<b>Food &amp; Beverage Processing</b>	1,800	1,200	\$ 20,568,600
<b>Government - Federal</b>	4,900	1,150	\$ 33,824,450
<b>Government - State &amp; Local</b>	3,800	900	\$ 26,316,700
<b>Health Care</b>	1,900	1,300	\$ 22,060,400
<b>Insurance</b>	3,300	1,600	\$ 31,425,300
<b>Manufacturing</b>	2,100	1,200	\$ 21,902,100
<b>Metals &amp; Natural Resources</b>	1,600	1,200	\$ 19,679,600
<b>Professional Services</b>	1,400	800	\$ 14,601,400
<b>Telecommunications</b>	8,500	2,500	\$ 63,965,000
<b>Transportation</b>	2,300	2,100	\$ 32,216,800
<b>Utilities</b>	1,600	800	\$ 15,490,400
<b>Cross Industry Average</b>	3,713	1,653	\$ 33,815,241

# Financial Impact of Mainframe Versus Server Tradeoffs

A sector by sector analysis of alternate computational deployment models (use of more than average mainframe or more than average servers) reveals significant cost tradeoffs. In instances in which mainframe computation was applicable to business needs, additional use of mainframe resources and reduction of physical servers resulted in average cost savings of 14.0%. In organizations that favored extended use of server where mainframe computing was applicable, costs were 33.3% higher for the cross industry average model.

	Platform Size and Costs to Support \$10B			Mainframe Centric Model Platform Size and Costs to Support \$10B Revenue				Server Centric Model Platform Size and Costs to Support \$10B			
	MIPS	Servers	Platform Cost at Gartner 2010 Benchmark Unit Costs	MIPS	Servers	Platform Cost at Gartner 2010 Benchmark Unit Costs	Gap to "Average Model"	MIPS	Servers	Platform Cost at Gartner 2010 Benchmark Unit Costs	Gap to Average Model
Banking	9,800	3,900	84,405,700	12,000	2,000	\$ 74,286,000	\$(10,119,700)	7,000	7,500	\$ 109,662,500	\$ 25,256,800
Consumer Products	1,900	1,600	25,202,300	2,327	821	\$ 18,934,659	\$ (6,267,641)	1,357	3,077	\$ 38,257,115	\$ 13,054,815
Education	1,300	500	11,015,000	1,592	256	\$ 9,761,099	\$ (1,253,901)	929	962	\$ 14,197,692	\$ 3,182,692
Electronics	2,500	1,100	22,632,800	3,061	564	\$ 19,514,989	\$ (3,117,811)	1,786	2,115	\$ 30,091,923	\$ 7,459,123
Financial Services	10,700	4,600	95,737,300	13,102	2,359	\$ 82,944,110	\$(12,793,190)	7,643	8,846	\$ 126,618,269	\$ 30,880,969
Food & Beverage Processing	1,800	1,200	20,568,600	2,204	615	\$ 16,242,066	\$ (4,326,534)	1,286	2,308	\$ 29,883,462	\$ 9,314,862
Government - Federal	4,900	1,150	33,824,450	6,000	590	\$ 32,846,385	\$ (978,065)	3,500	2,212	\$ 38,718,942	\$ 4,894,492
Government - State & Local	3,800	900	26,316,700	4,653	462	\$ 25,516,549	\$ (800,151)	2,714	1,731	\$ 30,191,346	\$ 3,874,646
Health Care	1,900	1,300	22,060,400	2,327	667	\$ 17,323,429	\$ (4,736,971)	1,357	2,500	\$ 32,215,000	\$ 10,154,600
Insurance	3,300	1,600	31,425,300	4,041	821	\$ 26,554,659	\$ (4,870,641)	2,357	3,077	\$ 42,702,115	\$ 11,276,815
Manufacturing	2,100	1,200	21,902,100	2,571	615	\$ 17,874,923	\$ (4,027,177)	1,500	2,308	\$ 30,835,962	\$ 8,933,862
Metals & Natural Resources	1,600	1,200	19,679,600	1,959	615	\$ 15,153,495	\$ (4,526,105)	1,143	2,308	\$ 29,248,462	\$ 9,568,862
Professional Services	1,400	800	14,601,400	1,714	410	\$ 11,916,615	\$ (2,684,785)	1,000	1,538	\$ 20,557,308	\$ 5,955,908
Telecommunications	8,500	2,500	63,965,000	10,408	1,282	\$ 59,691,209	\$ (4,273,791)	6,071	4,808	\$ 77,338,462	\$ 13,373,462
Transportation	2,300	2,100	32,216,800	2,816	1,077	\$ 23,797,187	\$ (8,419,613)	1,643	4,038	\$ 49,597,308	\$ 17,380,508
Utilities	1,600	800	15,490,400	1,959	410	\$ 13,005,187	\$ (2,485,213)	1,143	1,538	\$ 21,192,308	\$ 5,701,908
Cross Industry Average	3,713	1,653	33,815,241	4,546	848	\$ 29,085,160	\$ (4,730,081)	2,652	3,179	\$ 45,081,761	\$ 11,266,520
							-14.0%				33.3%

# Financial Impact of Mainframe Versus Server Tradeoffs

The tradeoffs are especially apparent in examining “IT cost of goods” across sectors.

Industry	Measure	Average IT Cost of Goods	Mainframe Biased	Server Biased
Airlines	Per Passenger Mile	\$ 0.007	\$ 0.0061	\$ 0.0076
Automotive	Per Vehicle	\$ 333	\$ 275	\$ 370
Chemicals	Per Patent	\$ 57,717	\$ 55,800	\$ 59,552
Consulting	Per Consultant	\$ 53,060	\$ 48,900	\$ 62,344
Hospitals	Per Bed per Day	\$ 64.30	\$ 54.4000	\$ 71.7000
Railroads	Per Ton Mile	\$ 0.0014	\$ 0.0012	\$ 0.0018
Retail	Per Store (Door)	\$ 494,818	\$ 421,346	\$ 560,300
Web Sites	Per Search	\$ 0.042	\$ 0.046	\$ 0.041
Trucking	Per Road Mile	\$ 0.177	\$ 0.1550	\$ 0.1940
Armed Service	Per Person	\$ 8,036.00	\$ 6,871.00	\$ 9,839
Utilities	Per MegaWatt Hour	\$ 2.63	\$ 2.21	\$ 2.94
Oil & Gas	Per Barrel of Oil	\$ 2.10	\$ 1.78	\$ 2.32

# Financial Impact of Mainframe Versus Server Tradeoffs

The tradeoffs are especially apparent in examining “IT cost of goods” in the financial services sector.

Retail Segment	Average	Server biased	Mainframe biased
Income per Employee (thousands)	\$ 359	\$ 261	\$ 388
<b>Deposits</b>	<b>Average</b>	<b>Server biased</b>	<b>Mainframe biased</b>
IT spend as % of Deposits Revenue	2.06%	2.37%	1.64%
IT spend as % of Deposits Expense	3.57%	4.15%	2.71%
IT Spend per Deposits Employee	\$ 40,745	\$ 44,143	\$ 25,215
IT spend per Account	\$ 2.75	\$ 3.12	\$ 1.61
IT Spend per Transaction	\$ 0.019	\$ 0.020	\$ 0.012
<b>Consumer Loans</b>	<b>Average</b>	<b>Server biased</b>	<b>Mainframe biased</b>
IT Spend per Consumer Loan	\$ 28.90	\$ 32.26	\$ 22.34
<b>Consumer Real Estate</b>	<b>Average</b>	<b>Server biased</b>	<b>Mainframe biased</b>
IT spend as % of CRE Revenue	6.06%	6.70%	2.33%
IT spend as % of CRE Expense	8.27%	12.93%	4.97%
IT Spend per CRE Employee	\$ 12,981	\$ 20,042	\$ 6,725
IT Spend per Approved CRE Loan	\$ 263.67	\$ 290.80	\$ 98.38
IT Spend per CRE Loan Application	\$ 98.84	\$ 106.89	\$ 37.16
IT Spend per CRE Loan Serviced	\$ 17.11	\$ 17.80	\$ 6.41
<b>Card</b>	<b>Average</b>	<b>Server biased</b>	<b>Mainframe biased</b>
Global Card IT as % of Revenue	6.54%	10.10%	3.54%
Global Card IT as % of Expense	11.04%	15.29%	8.32%
Global Card IT per Employee	\$ 39,812	\$ 53,319	\$ 26,823
Global Card Cost per Account	\$ 3.03	\$ 3.32	\$ 1.97
Global Card Cost per Transaction	\$ 0.16	\$ 0.18	\$ 0.10
<b>Call Center</b>	<b>Average</b>	<b>Server biased</b>	<b>Mainframe biased</b>
Total Call Center IT Cost as % of Expenses	28.10%	33.14%	27.18%
Total Call Center IT Cost per Employee	\$ 23,535	\$ 25,423	\$ 22,552
Combined Call Center Cost per Automated Call	\$ 0.66	\$ 0.79	\$ 0.53
Combined Call Center Cost per Agent Supported Call	\$ 0.92	\$ 1.01	\$ 0.86
<b>ATM</b>	<b>Average</b>	<b>Server biased</b>	<b>Mainframe biased</b>
ATM IT Cost as % of Revenue	6.20%	7.48%	3.77%
ATM IT Cost as % of Expense	8.25%	10.57%	4.29%
ATM IT Cost per Employee	\$108,105	\$ 143,998	\$ 60,952
ATM IT Cost per ATM	\$ 956	\$ 1,155	\$ 578
ATM IT Cost per Transaction	\$ 0.04	\$ 0.03	\$ 0.01
<b>Banking Center</b>	<b>Average</b>	<b>Server biased</b>	<b>Mainframe biased</b>
IT Cost per Banking Center	\$ 18,645	\$ 25,027	\$ 7,127
IT Cost per Teller Transaction	\$ 0.31	\$ 0.35	\$ 0.12
<b>eCommerce</b>	<b>Average</b>	<b>Server biased</b>	<b>Mainframe biased</b>
IT Cost per eCommerce Employee	\$477,165	\$ 618,500	\$ 283,570
IT Cost per Online User	\$ 18	\$ 19	\$ 16
IT Cost per Online Bill Payer	\$ 33	\$ 38	\$ 30
IT Cost per online Product Sale	\$ 66	\$ 71	\$ 62