

High Costs and Losses of Poor Quality Information

Here are sample anecdotes collected over the past twenty years that illustrate the costs and consequences of poor quality information and Information Systems.

Table 1-1 highlights the high costs of poor quality in Information Systems.

DISCLAIMER

The following anecdotes in Tables 1-1 and 1-2 have been cited from reputable sources. While I have not audited these findings, I have no reason to doubt their accuracy to within a 90 to 95 percent confidence level. I have sought to calculate the exchange rates at the prevailing time period of the failures.

Some of the examples listed are associated with biased and misleading information or fraud. Fraud, of course, is the worst scenario, and some may challenge them as not applicable. However, deliberate distortion of information also has costs to society, hurting individuals, organizations, and society as well. These truly appear as costs, financially, psychologically, and sociologically.

In virtually every disaster, Information Systems and Information Quality failures alike, there will be losses of Customers due to loss of confidence in the companies. British Gas, for one example, lost over 1 million Customers in 2006 alone. The lost revenue from this will exceed the direct cost losses from the failure.

Table 1-1 lists anecdotes of poor quality Information System Software and the costs of poor quality. The source and dates of the anecdotes are found at the end of each Outcome column cell entry. See the legend at the end of the Table.

Table 1-1: The High Costs of Poor Quality Information Systems Software and Databases

COMPANY / INDUSTRY	OUTCOME (COSTS	
	(M = MILLION; B = BILLION; T = TRILLION) (REF/DATE)	US\$ LOSS AMT
Allstate Insurance Co.	Office Automation System abandoned after deployment, costing \$130 M. (WSF, 1993).	\$130,000,000
Arianespace [France]	Software specification and design errors cause \$350 M Ariane 5 rocket to explode. (WSF, 1996).	\$350,000,000
AT&T Wireless	Customer Relationship Management (CRM) upgrade problems lead to revenue loss of \$100 M. (WSF, 2003-4).	\$100,000,000
Avis Europe PLC [UK]	Enterprise Resource Planning (ERP) System canceled after \$54.5 M spent. (WSF, 2004).	\$54,500,000

COMPANY / INDUSTRY	OUTCOME (COSTS (M = MILLION; B = BILLION; T = TRILLION) (REF/DATE))	US\$ LOSS AMT
British Gas (Centrica)	£300 M overhaul of billing System overbills Customers. BG wrote off £200 M due to complaints (11, 2006–2008) and filed suit against its contractor for £182M. (£482M * \$2/£).	\$964,000,000
BSkyB	After a failed Customer Relationship Management system, BSkyB sued EDS for £709 M (\$1.349 B(\$1.9)), for misrepresented EDS' abilities. (11, 2008/05/13).	\$1,349,000,000
Budget Rent-A-Car, Hilton Hotels, Marriott Int'l, and AMR	American Airlines Travel Reservation System canceled after \$165 M spent. (WSF, 1992).	\$165,000,000
Chemical Bank	Software error causes \$15 million to be deducted from 100,000 Customer accounts. (WSF, 1994).	\$15,000,000
CIGNA Corp.	Problems with CRM System contribute to \$445 M loss. (WSF, 2002).	\$445,000,000
Federal Bureau of Investigation	\$170 M for Networked System to replace paper system. Scrapped one year after delivery. (Washington Post, 2006/08/18).	\$170,000,000
Ford Motor Company	Purchasing System abandoned after deployment costing \$400 M. (WSF, 2004).	\$400,000,000
FoxMeyer Drug Company	\$40 M ERP System abandoned after deployment, bankrupting company. (WSF, 1996).	\$40,000,000
Greyhound Lines Inc.	Bus Reservation System crashes repeatedly upon introduction, causing revenue loss of \$61 M. (WSF, 1993).	\$61,000,000
Hershey Foods Corp.	Problems with ERP System contributes to \$151 M loss. (WSF, 1999).	\$151,000,000
Hewlett-Packard Company	Problems with ERP System contribute to \$160 M loss. (WSF, 2004).	\$160,000,000
Hudson Bay Co. [Canada]	Problems with Inventory System contribute to \$33.3 M loss. (WSF, 2005).	\$33,300,000
J Sainsbury PLC [UK]	Supply-Chain System abandoned after deployment costing \$527 M. (WSF, 2004).	\$527,000,000

(continued)

Table 1-1 (continued)

COMPANY / INDUSTRY	OUTCOME (COSTS (M = MILLION; B = BILLION; T = TRILLION) (REF/DATE))	US\$ LOSS AMT
Kmart Corporation	Supply-Chain System canceled after \$130 M spent. (WSF, 2001).	\$130,000,000
London Ambulance Service [UK]	Dispatch System canceled in 1990 at \$11.25 million; second attempt abandoned, costing \$15 M. (WSF, 1993).	\$26,250,000
London Stock Exchange [UK]	Taurus Stock Settlement System canceled after \$600 M spent. (WSF, 1993).	\$600,000,000
McDonald's Corporation	The Innovate Information-Purchasing System canceled costing \$170 M. (WSF, 2002).	\$170,000,000
Nike Inc.	Problems with Supply-Chain System causes \$100 M loss. (WSF, 2001).	\$100,000,000
Oxford Health Plans Inc.	Billing and Claims System problems contribute to quarterly loss; stock plummets, leading to \$3.4 B loss in corporate value. (WSF, 1997).	\$3,400,000,000
Snap-on-Tools	Problems with Order-Entry System causes \$50 M revenue loss. (WSF, 1998).	\$50,000,000
State of California	DMV System canceled after \$44 M spent. (WSF, 1994).	\$4,000,000
State of Mississippi	Tax System canceled after \$11.2 M is spent; state receives \$185 M in damages. (WSF, 1999).	\$196,200,000
State of Washington	Department of Motor Vehicle (DMV) System canceled after \$40 M spent. (WSF, 1997).	\$40,000,000
Sydney Water Corp. [Australia]	Billing System canceled after \$33.2 M spent. (WSF, 2002)	\$33,200,000
Toronto Stock Exchange [CAN]	Electronic Trading System canceled after \$25.5 M is spent. (WSF, 1995).	\$25,500,000
UK Inland Revenue	S/W errors contribute to \$3.45 B tax-credit overpayment. (WSF, 2004–5).	\$3,450,000,000
U.S. Federal Aviation Admin.	Advanced Automation system canceled after \$2.6 B spent. (WSF, 1994).	\$2,600,000,000
U.S. Internal Revenue Service	Tax Modernization effort canceled after \$4 B is spent. (WSF, 1997).	\$4,000,000,000

COMPANY / INDUSTRY	OUTCOME (COSTS (M = MILLION; B = BILLION; T = TRILLION) (REF/DATE))	US\$ LOSS AMT
United Way	Administrative Processing System canceled \$12 M spent. (WSF, 1999).	\$12,000,000
Washington, D.C.	City Payroll System abandoned after deployment \$25 M spent. (WSF, 2000).	\$25,000,000
U.S. Bureau of Indian Affairs	Spent \$12.5 M on Maintenance Repair System for schools that failed to capture quality information. (5: 2003/08).	\$12,500,000
U.S. Business spend on unwanted systems	BPN Forum survey = 10% to more than 20% of IT budget wasted on unwanted systems; Calc: \$13.84 T (U.S. GDP) × 10% (IT budget) = \$138.40 B × 20% (waste rate/yr) = \$24.6 B wasted per year. (BPN Forum,).	\$24,600,000,000
Total Costs of Poor Quality Software in these examples in US\$		\$44,589,450,000

Sources: WSF: "Why Software Fails"; BW = *Business Week*; CEO = *CEO Magazine*; CW = *Computerworld*; IW = *InfoWeek*; FCW = *Federal Computer Week*; For = *Fortune*; NYT = *The New York Times*; Tim = *Time*; WSJ = *The Wall Street Journal*; III = *Information Impact International*; USA = *USA Today*; FT = *Financial Times*; LTim = *London Times*; LTel = *London Telegraph*; TN = *The Tennessean*; N&O = *News and Observer*; Aus = *The Australian*; AFR = *Australian Financial Review*; LAT = *LA Times*; NAO = UK Nat'l Audit Office; Wired.com = <http://www.wired.com/science/discoveries/news/2004/02/62242>.

Table 1-1 illustrates the incredibly high Costs of Poor Quality in Information Systems software. These are Information Systems with such poor quality that they had to be scrapped. For every scrapped Information System, there are hundreds more that have significant defects that Knowledge Workers have to live with. Information Producers and Knowledge Workers are struggling to perform their work when the defects are not so catastrophic as to scrap the systems. This wastes the time of our most important resource: people.

As organizations become more and more dependent on Information Technology, they must ensure they design quality into the Information Management and Information Systems Engineering processes, so they error-proof Information Systems to the extent possible.

When systems fail, business processes stop or must be handled manually, always with a risk of omission and error in capturing data.

Table 1-2 documents anecdotes of actual losses and Costs of Poor Quality Information that cause business processes to fail, requiring costs of recovery from the failure and the Information Scrap and Rework required to find and correct the information so other processes do not fail. Sources and dates of anecdotes are found at the end of each Outcome cell in Table 1-2.

Table 1-2: The High Costs of Poor Quality Business Information

COMPANY / INDUSTRY	OUTCOME (COSTS (REF DATE))	LOSS AMOUNT
AIG	Agrees to pay \$1.6 B to settle allegations that it used deceptive accounting practices to mislead investors and regulatory agencies. (TN, 2006/02/10).	\$1,600,000,000
AIG	Bailout money of \$223 B from taxpayers. (TN, 2009/03/03).	\$223,000,000,000
Arthur Andersen	Auditing failure at Enron led to \$1.3 B loss in pension. (FT, 2002/01).	\$1,300,000,000
AT&T	AT&T agrees to pay \$177,000 in fines in Tennessee for billing Customers for services they hadn't authorized. (TN, 2004/03/06).	\$177,000
Australia Dept. of Defence	Defence to lose compensation billions in reforms due to overcompensation due to error in inflation: A\$ 4.3 B = US\$ 2.99 B. (AFR, 2009/03/30).	\$2,990,000,000
Bristol-Myers-Squibb	Fined \$150 M for inflating its revenue. (USA, 2004/04/05).	\$150,000,000
Bristol-Myers-Squibb	Paid \$300 M to settle lawsuit (accounting re: Imclone). (USA, 2004/04/04).	\$300,000,000
Cell Phone Companies	Agree to pay 32 states \$5 M and required to give Customers a grace period for cancellations and better information. (TN, 2004/07/22).	\$5,000,000
City Government	Free garbage pick-up due to oversight for 90 homes outside of Nashville's urban services district for almost 10 years may have cost the city as much as \$55,000. (TN, 2005/03/10).	\$55,000
Citigroup	Citigroup paid \$2 B to settle a lawsuit over its role in helping Enron manipulate its accounting that led it to Enron's collapse. (TN, 2005/06/11).	\$2,000,000,000
Citigroup	Citigroup paid \$2.7 B to investors to settle a class-action lawsuit over losses in WorldCom accounting fraud. It set aside another \$6.7 B for other lawsuits. (USA, 2004/05/11).	\$9,400,000,000

COMPANY / INDUSTRY	OUTCOME (COSTS (REF DATE))	LOSS AMOUNT
Citigroup	Paid \$18 M refunds and settlement for taking \$14 M from Customers' credit card accts. (USA, 2008/08/27).	\$18,000,000
Community Health Systems	CHS to pay \$31 M in settlement due to billing errors. (TN, 2000/03).	\$31,000,000
DirecTV	Paid \$5 M for misleading program packaging. (TN, 2005/12/03).	\$5,000,000
DuPont	DuPont's failure to report widespread exposures to a toxic chemical costs it \$16.5 M in fines & payouts. (TN, 2005/12/13).	\$16,500,000
Enron	Ex-CEO Skilling enters prison for 24-year sentence. He and Ken Lay were convicted on many counts of fraud, conspiracy, and insider trading — loss of \$60 B in stock & \$2 B in pension plans. (TN, 2006/12/14).	\$62,000,000,000
Enron	Settled lawsuit for \$168 M for misleading Stakeholders. (TN 2005/01/09).	\$168,000,000
Fannie Mae	Required to restate 2004 earnings down by \$11 B due to serious accounting problems and earnings manipulation. (TN 2006/05/10).	\$11,000,000,000
Fannie Mae	Spent \$1 B to correct years of false financial reports. (TN 2008/08/24) .	\$1,000,000,000
Federal Agency	Overpaid one set of beneficiaries by \$1.7 B and underpaid another set of beneficiaries by \$600 M. (Private Client, 2005).	\$2,300,000,000
FEMA	The GAO 95% confident that improper FEMA payments were between \$600M & \$1.4B re Katrina & Rita = \$1 B. (USA, 2007/06/15).	\$1,000,000,000
Financial A	Acquired subprime mortgage company without due diligence on data. Write-down \$2.6 B & \$1 B in debt & 100 M loss. (III, BW, 2000).	\$3,700,000,000
Franklin Advisors	Settled lawsuit for \$50 M for illegal, rapid trading transactions. (USA, 2004/08/03).	\$50,000,000

(continued)

Table 1-2 (continued)

COMPANY / INDUSTRY	OUTCOME (COSTS (REF DATE))	LOSS AMOUNT
General Motors	Takes a \$39 B charge to stay in compliance with accounting law. (USA, 2007/11/07) .	\$39,000,000,000
Goodyear	Billing errors in accounting led to \$100 M loss. (TN, 2003/10/23).	\$100,000,000
Google	Shortchanged thousands of their advertisers and settled a lawsuit for \$60M. (2006/05/08).	\$60,000,000
Government	Billions in 9/11 recovery loans were misused by those who were not affected or did not need them. Estimated at \$2.5 B. (TN, 2005/09/09).	\$2,500,000,000
Government Contractors	U.S. Military suspends \$160 M in charges due to inaccurate and incomplete files and bills. (USA, 2004/05/18).	\$160,000,000
Halliburton	Report questions over \$1.4B of Halliburton Bills. (USA, 2005/06/28).	\$1,400,000,000
Halliburton KBR	Poor accounting costs KBR \$1.2 B for contracting. (WSJ-EU, 2004/04).	\$1,200,000,000
Healthways	Calls off \$307.5 M merger with LifeMasters Supported Self Care over "data & reporting errors" that minimized its value. (TN, 2006/08/03).	\$307,500,000
Hubble Telescope	Error in mirror specification causes a \$700 M repair. (wired.com, 2004/02/11).	\$700,000,000
Institute of Medicine	Report found 1.5 million people harmed by medication errors per year. Extra costs to treat medication-related injuries in hospitals alone amount to at least 3.5 B per year. (USA, 2006/07/21).	\$3,500,000,000
Insurance company A	Lost \$5 B one year and \$3 B the next due to poor risk analysis. (III Private, 2002).	\$8,000,000,000
Insurance company B	One third of staff time is Information Scrap and Rework = \$23.4 M/year. (III Private, 2004).	\$23,430,000

COMPANY / INDUSTRY	OUTCOME (COSTS (REF DATE))	LOSS AMOUNT
Janus Capital	Client pulls \$5 B out of Janus over improper trading. Losses est. at \$250 M/yr. (TN, 2004/07/30).	\$250,000,000
Janus Capital Group	Fined \$226 M for improper trading actions. (WSJ, 2004/04/20).	\$226,000,000
KPMG	Sued \$1 B (£692 M) for accounting irregularities in collapse of New Century Financial. (FT, 2009/04/02)	\$1,000,000,000
L.A. County	Due to poor calculation of pension funds incurred \$1.2 B liability. (LAT, 1998/04/08).	\$1,200,000,000
Lucent	Fined \$25 M for overstating revenue and earnings. (USA, 2004/05/18).	\$25,000,000
Mazda	Fined \$5.25 M for failure to disclose required information on leases. (TN, 1999/10/02).	\$5,250,000
Medical Care	98,000 people a year in U.S. die from medical error @ \$147 M legal costs. (USA, 2002/07/24).	\$147,000,000
Medicare	35M Handbooks with wrong info. 13,000,000 Booklets @ \$.55/book to replace. (TN, 2005/10/6).	\$19,250,000
Medicare	Paid out \$339 M in improper claims. (TN, 1998/10/01).	\$339,000,000
Merck	Merck paid IRS \$2.04 B due to disallowed deductions. (WSJ, 2004/05/10).	\$2,040,000,000
Merck	Merck & Co. settled its U.S. personal injury claims over Vioxx for \$5.2 B in 11/2007 (deceptive advertising). (Aus, 2009/03/30).	\$5,200,000,000
Merck	Merck & Co. seeks to settle its personal injury claims over Vioxx in Australia. Estimated legal costs @ US \$ 400 M. (Aus, 2009/03/30).	\$400,000,000
Mizuho Securities	Typing error leads to 225M loss on Tokyo stock exchange. Trader tried to sell 610,000 shares at 1 yen of com co. He intended to sell 1 share at 610,000 yen. (TN, 2005/12/11).	\$225,000,000

(continued)

Table 1-2 (continued)

COMPANY / INDUSTRY	OUTCOME (COSTS (REF DATE))	LOSS AMOUNT
Morgan Stanley	Paid \$15M fine to settle charges that it hid a large trove of archived information from the U.S. Securities and Exchange Commission. (USA, 2006/05/11).	\$15,000,000
Morgan Stanley	Books a quarterly loss of at least \$1.2 B to \$1.7 B due to wrong accounting treatment of bonds. (WSJ.com, 2009/04/09).	\$1,450,000,000
Morgan Stanley	Fined \$2.2 M for late communication to investors. (WSJ, 2004/07/30).	\$2,200,000
Mutual Fund Companies	Fleeing investors hurt scandal-tainted fund companies worse than fines . Losses estimated at \$500 M. (TN, 2004/09/03).	\$500,000,000
NASA-Mars Climate Orbiter	Miscalculation of English units of measure to metric causes total loss of \$125 M and lost scientific measurement. (CNN.com, 1999/09/30).	\$125,000,000
Nashville Metro Govt.	Overlooked collection of fines and has lost \$57 M. (TN, 2009/01/16).	\$57,000,000
Natwest Bank	Derivatives pricing error led to £91 M = \$152 M loss; selling off Equities division led to \$1.192 B write-off (Tot = \$1.344 B). (USA, 1997/12/03).	\$1,344,000,000
Not-for-Profit org.	Direct Costs due to poor IQ = \$42,192,000 per year. (III Private, 2008).	\$42,192,000
Package Delivery co.	Failed to invoice for 4.2% of packages delivered = \$340 M/year. (III Private, 2006/02).	\$340,000,000
Pentagon	Pentagon's books defy auditors; fixing it costs at least \$13 B. (N&O, 2006/02/12).	\$13,000,000,000
Pharmaceuticals fined	Abbott fined \$600 M for improper marketing of some products. (USA, 2003/07/24): AstraZeneca fined \$354 M for giving drugs to MDs to bill medicare; Ross Products paid \$200 M and \$400 M for criminal/civil penalties; Tap Pharmaceuticals paid \$875 M fine.	\$2,429,000,000

COMPANY / INDUSTRY	OUTCOME (COSTS (REF DATE))	LOSS AMOUNT
Putnam Investments	Customers withdrew \$4.4B from Putnam funds over accounting errors. (WSJ, 2003/11/7).	\$4,400,000,000
RiteAid	Errors in accounting led to \$1.81 B write-down over three years. (TN, 2002/6/22).	\$1,810,000,000
Shell	Fined \$151.5 M for overstating oil reserves. (WSJ, 2004/07/30).	\$151,500,000
Sprint	Sprint records \$29.5 B loss in Nextel write-down. Poor service and dropped calls lost Sprint 683,000 subscribers. (Blm, 2008/02/29).	\$29,500,000,000
State of Tennessee	Had to compensate wrongly convicted man \$833,000. (TN, 2004/10/05).	\$833,000
Telco A	Costs of poor quality eliminated over 10 years \$800 M. (Ill Private, 2004).	\$800,000,000
Telco B	Losses of \$50 M in un-invoiced services (Ill Private, 2002).	\$50,000,000
Ten Wall Street firms	Fined a total of \$1.4 B by SEC (misleading investors) (TN, 2004/08/27).	\$1,400,000,000
UBS	Lost \$664 M (911 M Swiss francs) due to poor risk management data. (NYT, 1998/11/18).	\$664,000,000
UBS	Lost 19.7 B Swiss francs (\$17 B) in 2008 as it wrote down the value of some debt assets and wealth management clients withdrew money. (NYT, 2009/5/29).	\$17,000,000,000
U.K. Gov.	Pension calculation errors cause some pensioners to be overpaid by up to £140 M with others underpaid by £100 M. (LTim, 2009/3/9). Tot £240 M x 1.45 (exchange) = \$348 M.	\$348,000,000
U.K. Inland Revenue	Inland Revenue overpaid tax credits for disabled persons of between £510 million and £710 million from errors in understated income. £82M (\$123.3 M). (NAO, 2003/11/19). (exchange= \$1.45:£= \$884.5 M).	\$884,500,000

(continued)

Table 1-2 (continued)

COMPANY / INDUSTRY	OUTCOME (COSTS (REF DATE))	LOSS AMOUNT
U.K. Inland Revenue	Penalties caused by failed Inland Revenue processing. 300,000 at £900 (\$1.504) = \$406 M. (LTel, 2003/03).	\$406,080,000
U.K. Office of Nat'l Statistics	Overpaid staff £11 M (\$16.5 M). (FT, 2003/03/26).	\$16,544,000
U.K. Revenue & Customs	A National Audit found £6.6 B overpayment in tax credits; £1-1.3 B paid in 2004-5 to claimants not entitled; £575 M in 2006; £800m not collected and £340 M overpaid by taxpayers. £135 M (US\$ 191 M) a year lost because tax due on pensions is not collected. (FT, 2007/7/13). £1 = \$2.037. (exch on 2007/07).	\$17,926,000,000
U.S. Bureau of Indian Affairs	After spending \$12.5 M on the system software, they had to spend \$13 M to correct the records. (FCW, 2003/08).	\$13,000,000
U.S. Government	Costs to upgrade voting equipment: \$3.8 B after the 2000 Presidential election failure. This did not solve the problem. (USA, 2002/10).	\$3,800,000,000
U.S. Government	Owed more than \$35 B in fines from criminal and civil cases but collects less than half of that (\$20 B). (TN, 2006/03/09).	\$20,000,000,000
U.S. Government	An error in an addendum that required oil and gas companies to pay federal royalties on offshore leases cost the US \$7B (TN, 2006/03/02).	\$7,000,000,000
U.S. Internal Revenue Service	A study conducted by Treasury Department investigators posing as taxpayers determined that IRS employees gave wrong answers to 28% of the questions. \$50 M est. losses. (TN, 2003/09/04).	\$50,000,000
U.S. Internal Revenue Service	The U.S. tax gap of taxes owed to taxes collected is a deficit of \$290 B per year in 2001 and 2002. (TN, 4/17/2006).	\$290,000,000,000

COMPANY / INDUSTRY	OUTCOME (COSTS (REF DATE))	LOSS AMOUNT
U.S. Internal Revenue Service	"Tax gap" for the IRS in failure to collect taxes is around \$350 B per year in lost revenue in 2005 and 2006. (S. Hrg. 110-698, 2007/04/18). (http://finance.senate.gov/hearings/46363.pdf).	\$350,000,000,000
U.S. Internal Revenue Service	Losses from \$200 to \$300 M in taxes because software that screened for fraudulent refunds was not working. (TN, 2006/07/15).	\$250,000,000
University of California	Sued AOL for overstating ad revenues and subscribers. Loss of \$450 M in value. (USA, 2003/04).	\$450,000,000
WorldCom	Former WorldCom head, Bernie Ebbers jailed over the \$11 B accounting manipulation. (FT, 2005/03/16).	\$11,000,000,000
WorldCom	Fined \$500 M by SEC for its \$9 B accounting scandal. (USA, 2003/05).	\$500,000,000
Xerox and Arthur Andersen	Xerox fined \$10 M and Andersen fined \$7 M for inaccurate financial reporting. (USA, 2002/04).	\$17,000,000
Subtotal	Poor Quality Information Costs – from Table 1-2	\$1,167,785,029,000
Poor Software Quality Costs	Poor Quality Software Costs – from Table 1-1	\$44,589,450,000
Grand Total	Total Costs of Poor Quality Information & Systems	\$1,212,374,479,000

Sources: WSF: "Why Software Fails"; BW = *Business Week*; CEO = *CEO Magazine*; CW = *Computerworld*; IW = *InfoWeek*; FCW = *Federal Computer Week*; For = *Fortune*; NYT = *The New York Times*; Tim = *Time*; WSJ = *The Wall Street Journal*; III = *Information Impact International*; USA = *USA Today*; FT = *Financial Times*; LTim = *London Times*; LTel = *London Telegraph*; TN = *The Tennessean*; N&O = *News and Observer*; Aus = *The Australian*; AFR = *Australian Financial Review*; LAT = *LA Times*; NAO = UK Nat'l Audit Office; S. Hrg. = Senate Hearing; Wired.com = <http://www.wired.com/science/discoveries/news/2004/02/62242>.

If the costs of Poor Quality Information of: **\$1,212,374,479,000** — nearly **One and a Quarter Trillion Dollars** — of waste in these 122 mostly reputable organizations, not counting recurring annual costs, *doesn't shock the heck out of you*, I do not know what will motivate you to address Information Quality within your own organization.

Many organizations may read about these companies and government entities and write them off. "But we are different," they may say. But if they are not in Stage 3 of Information Quality Management maturity, they will only be misleading themselves.

Remember that these are direct costs only and do not list missed or lost opportunity. Also know that your costs to create and develop a sustainable Information Quality Management capability and culture will be a fraction of the waste you are incurring every year in out-of-control information processes.

Also know that you cannot solve your problems by simply buying IQ software and inspecting and correcting your way out of your IQ problems. You must attack this as a serious threat to your enterprise, with your IQ initiative being driven by your Top Leadership Team.

Societal Costs and Losses Caused by Poor Quality Information

It is not just the direct and opportunity costs of poor quality information to the enterprise that are harmful, it is also the societal losses, causing Customers to pay higher prices for goods and services and causing Citizens to pay higher taxes. Defective information can cause death and injury due to medication error or wrong medical procedures. Students may be denied entrance to universities because of errors in scoring required entrance exams. Consumers may buy harmful foods if nutritional labels are not accurate to a minimum level. People will be convicted of crimes they did not commit or guilty offenders may be released in error, putting citizens at risk. See the following sidebars for a small, but representative, examples of such losses.

STUDY: MEDICAL ERRORS KILL AS MANY AS 98,000 U.S. PATIENTS YEARLY

Journal of the American Medical Association reports as many as 98,000 people in the U.S. die from medical errors, despite increased focus on attempts to reduce errors.²

U.S. NAVY SUB HITS MOUNTAIN NOT ON ITS NAVIGATION CHARTS

The nuclear attack submarine, the *San Francisco*, was severely damaged when it cruised at high speed, around 30 knots, into an underwater mountain that was not on its navigation charts. One sailor was killed, while 23 others were injured. Fortunately, the nuclear reactor was not damaged. If damaged, it could have caused long-term problems.³

FATAL AEROBATICS AS NAVIGATION MAP OMITTS GONDOLA**N**

Maps given to Marine flight crews did not show a gondola lift on the steep mountainside at Cavalese in the Italian Alps, even though lifts have been there for decades. Also, the flight rules issued did *not* include a ban on flying below 2,000 feet above the terrain. The Marine pilot was showing off that day, flying faster than authorized and dipping below 400 feet above the terrain.

Whether he was aware of the _____, his reckless behavior led to his slicing the gondola cable, causing the car to come crashing down, killing the 20 people on board.⁴

RAPIST REMAINED AT LARGE FOR EIGHT YEARS BECAUSE OF "TYPING ERROR"

A violent rapist in the U.K. remained at large for eight years because of a "typing error" in recording DNA evidence, police said. The rapist attacked and tried to strangle a 19-year-old woman who was walking home in Rainham, Kent, in 1996. But the rapist was not arrested for some time, despite giving a DNA sample that matched police evidence three months after the attack. He was jailed for 12 years by Maidstone Crown Court after admitting to the crime.⁵

DIALYSIS EQUIPMENT SENT TO WRONG PLACE

Four new dialysis chairs were sent to a remote hospital in north Queensland, Australia, where no patients with kidney problems lived. At the same time, no dialysis chairs were provided in locations where many dialysis candidates reside.⁶

EURO COINS ORDERED TO BE REMINTED

Nine million of the first Euro coins minted in France had to be melted down and minted again in 1998. Some of the coins were not minted to specification. The 10-cent and 50-cent coins had to be reminted because they did not conform to the previously agreed specifications that called for raised ridges along the edges.

Vending machine operators found that the 50-cent coin was too light, making it impossible for machines to tell it apart from the 20-cent coin.

This example illustrates the importance of correct product specifications.⁷

SMART BOMBS DESTROY HOUSE, KILLING INNOCENTS

In January 2005, U.S. forces mistakenly dropped a 500-pound bomb on a house, destroying it and killing from five to 14 people, injuring five others. The house was not the intended target.

There have been many unfortunate failures of so-called "smart bombs" and attacks on innocents, due to poor quality information and communication in the Afghanistan and Iraq "wars."⁸

In another incident, a U.S. pilot failed to clearly identify a target and fired on friendly forces, killing a British soldier and injuring several others.⁹

PASSENGER WEIGHT A CAUSE OF CRASH OF FLIGHT US5481

US Airways Express flight 5481 came crashing down just after take off due to two causes. One was the inaccurate average weight of passengers was too low, and the other was that poor maintenance of the cables that attached to the elevator that adjusted the plane's tail flap. As a result of these two problems, the pilots were unable to control the flight, killing all 21 people aboard.

As the American population has grown, literally, in weight, airlines must measure their passengers' weight and adjust the weight measurements to ensure safety of all. The FAA issued a temporary order to add 10 pounds to each passenger's weight and five pounds to the weight of each bag.¹⁰

INCORRECTLY GRADED SAT TEST SCORES LOWERED SCORES FOR 4000

Errors in software that graded the SAT exams of U.S. college applicants in October 2005 caused 4,000 exam takers' scores to be wrong, lower than their actual results. In 5% of the tests, scores were 100 points lower than they should have been. This could have caused college applicants to be denied entrance.

In another incident in Minnesota, a scoring error led to 8,000 students being told they failed a 2000 state math test.

In 2005, 4,000 students taking an ACT Chemistry exam were given wrong scores.¹¹

MISLEADING FOOD LABELS LEAD TO POOR HEALTH DECISIONS

Nutritional information on some food products is "wildly inaccurate," a U.K. consumer magazine has warned. They looked at 370 nutrients in 70 products and found just 7% exactly matched the quantities on the labels. Some 17% fell outside the accepted 20% margin of error, including a kids' pizza with 47% more sugar than stated.

Currently there is no specific law about how accurate the information on food labels should be. They need only show average nutrition values in the U.K.

Worst offenders:

- Rivington's Pink Panther wafers had three times more saturated fat than stated.
- Cadbury's Light Truffles contained 23% more fat than stated.
- Tesco Kids Hot Dog Pizza contained 47% more sugar than claimed.

The consequences are that food choices are made based on misleading nutritional information, which will cause health problems.

Editor Malcolm Coles said: "Nutrition labels help people compare foods and make healthy choices, but only if they're accurate. How can you trust what you're eating when so many labels fall outside even the fairly generous margins of error allowed?"¹²

28% OF MOTOR LICENSES IN SOUTHWEST ENGLAND ARE NOT ACCURATE

A government study reveals that almost 28% of all drivers in the region do not update their licenses when they get married or move. Accurate information is required for police to track down stolen vehicles and for emergency crews at the scene of an accident. Failure to keep data accurate can lead to a £1,000 fine.¹³

FIRM SEEKS 200,000 TIRES SUBJECT TO RECALL

Poor quality information is hampering Bridgestone/Firestone from locating some 200,000 defective recalled tires that may still be on Ford Explorers. Owners may be at risk if they are driving on them, and are urged to notify Bridgestone/Firestone.¹⁴

LOSS OF NASA'S MARS CLIMATE ORBITER IS LOSS OF KNOWLEDGE

While the loss of the \$125 million Mars Climate Orbiter wasted money, the real loss was the inability to capture knowledge about Mars to better understand our universe.¹⁵

The Orbiter's loss was caused by the use of English units of measure to calculate the trajectory and altitude of the Orbiter as it was supposedly sent into orbit around Mars. However, the NASA team entered the data as metric data (NASA's standard). By the time the NASA team realized that the data provided was not metric, it was too late to transmit the corrected data, and the Orbiter was sent in to an altitude below the gravitational pull, sending it crashing down on the backside of Mars.

A BROKEN SYSTEM: ERROR RATES IN U.S. CAPITAL CASES 1973-1995

- Overall rate of prejudicial error (serious, reversible error) in the American capital punishment system was 68%.¹⁶
- Capital trials produce so many mistakes it takes three judicial reviews to catch them.
- Of the 2,370 death sentences thrown out due to serious error, 90% were overturned by state judges; many had imposed the sentence in the first place.

Most common errors:

- Defense lawyers didn't look for, or missed evidence that the defendant was innocent.

(continued)

A BROKEN SYSTEM: ERROR RATES IN U.S. CAPITAL CASES *(continued)*

- Police/prosecutors discovered missed or important evidence, but suppressed it.
- 82% of the people whose capital judgments were overturned by state post-convictions courts due to serious error were found to deserve a sentence less than death.
- In 20 out of 23 study years, more than 50% of capital cases had serious flaws. In 10 of the study years, the error rate was 60%.
- Over 90% of death-sentencing states have error rates of 52% or higher. 85% have rates of 60% or higher. Three-fifths have error rates of 70% or higher.

BROKEN ELECTIONS PROCESSES DISENFRANCHISE MILLIONS OF VOTERS

The 2000 Presidential election saw from four to six million voters lose their votes because of over-voting (voting for two or more candidates) or under-voting (not recording a vote, failed chad penetration, or too light pencil marks). The number of disenfranchised voters was the equivalent of more than all the voters who voted in Florida that year!¹⁷

25 PERCENT OF U.S. CONSUMER CREDIT REPORTS CONTAIN MATERIAL ERRORS

Conducted by the U.S. PIRG Education Fund studied reports from thirty states and found 25 percent contained material errors that would deny credit for the individuals affected. In addition:

- 54% contained personal information that was inaccurate or missing.
 - 22 % of reports listed the same mortgage or loan twice.
 - 8 % were missing major credit, loan, or other consumer accounts that demonstrated creditworthiness of the consumer.
 - 30 % contained credit accounts that had been closed by the consumer but remained listed as open.
- Altogether, 79 % contained serious errors or other mistakes.¹⁸

The sad truth in all of these examples and many others ends up costing the Consumers, Citizens, innocent bystanders, and Voters in time and money, paying for the recovery from process failure and Information Scrap and Rework because of organizations' broken information processes.

Revisiting the Costs of Poor Quality Information

The costs of poor quality in manufacturing, service, and government have been well documented over the past seven decades. Table 1-3 lists what the quality gurus peg as the costs of poor quality.

Table 1-3: The High Costs of Low Quality in Manufacturing and Service Sectors

QUALITY AUTHORITIES	INDUSTRY	PERCENT OF REVENUE		
		LOW	TO	HIGH
Philip Crosby	Manufacturing	15%	to	20%
Siegel & Shim	All Sectors	20%	to	25%
F. Steingraber	Manufacturing	25%	to	30%
	Service Sector	20%	to	30%
A.V. Feigenbaum	Manufacturing	15%	to	40%
W.E. Deming	Manufacturing	25%	to	50%
Joseph M. Juran	Manufacturing	20%	to	40%
L.P. Carr	Manufacturing	25%	to	30%
	Service Sector	30%	to	50%
Average for All		22%	to	35%

The Quality thought leaders have clearly identified the significant costs and losses in manufacturing and the service sectors when poor quality exists.

What is our experience of the Costs of Poor Quality Information? In the Costs of Poor Quality Information analyses that we have conducted, combined with the anecdotal evidence we have collected over the past twenty years, the evidence is clear. The Costs of Poor Quality Information as a percent of operating revenue or budget (for government and not-for-profit) is roughly equivalent to the costs of poor quality in the manufacturing and service sectors. In fact, manufacturing costs of poor quality often are caused by Information Quality issues such as errors in engineering and manufacturing specs or inaccurate inventory counts that cause materials shortages or materials and product overages.

In my first book *Improving Data Warehouse and Business Information Quality*, Wiley, (1999), I estimated the Costs of Poor Quality Information at from 10 to 25 percent of operating revenue. I was wrong!!! For the typical immature organization, the costs are much higher.