Return on Investment

For Information Technology Providers

Using ROI as a Selling and Management Tool

Thomas Pisello

With Introduction by Paul A. Strassmann

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This book is dedicated to the patience of my wife Judy and our daughter Sophia.

First and foremost I would like to thank Paul Strassmann, whose lifelong pursuit of improving the management of Information Technology has inspired me to do the same. I would also like to thank Paul Demopoulos, whom I have worked with on TCO and ROI over the past eight years and who has contributed much to this work. The Alinean team – Steve Arseneault, Mike Friedlander and Betty McNeil – provided invaluable help in developing models and examples, and helped validate them with real-world experience. And Gartner - particularly Bill Kirwin – who provided a valuable forward, and for their continued research and tools on Total Cost of Ownership and value.

Our solution provider experience comes from working with some of the leading technology companies. Kevin Auger, Kathy Quinn, Sharon Seaberg, Lyndon Wilkes, Ken Nichols and Ron Barnes provided invaluable input by reviewing and editing this work, and assisted through practical applications of our models to their selling solutions.

The book would not have been possible without the editing and creative efforts of Judy Robinet.

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Preface

Every day, IT executives are inundated with new technology to help their company improve user productivity, create frictionless supply chains, enhance customer relationships and better handle information overload.

Just a few short years ago, in a rush to meet market demands, corporations could not implement infrastructure and new business solutions such as these quick enough. But the irrational exuberance of the Internet boom is over. As such, corporations are demanding quantifiable proof that the proposed technology will drive corporate benefit, and proof that current projects have actually had an impact. Worse, several new studies indicate that productivity improvements and profits from IT investments may not be as grand as expected. In one-hand lies an e-mail requesting budget cuts from the CEO. In the other hand a new study indicating the lack of value derived from IT. The CIO is armed to draw blood from the IT vendor.

As the boom ends, IT solution providers have been caught off guard. The vendor's unprepared sales professionals and consultants now face a skeptical audience that demands quantifiable return on investment from IT expenditures. Before spending the precious resources of an enterprise, CIOs and IT executives need to see that their capital investments will payoff, and they are seeking vendor partners who clearly understand this new environment of fiscal restraint and responsibility.

This book is written to help Information Technology provides understand this new landscape and present the background necessary for using Return on Investment (ROI) to cost-justify technology solutions. This work develops a methodology and model to take return on investment analysis to the next level – helping IT vendors improve the analysis, procurement and financial management of their technology solutions.

Who Should Read This Book?

This book is aimed at Information Technology (IT) provider executives, product managers, marketing managers, sales professionals and consultants. Specifically, this book takes a micro-economic view of IT projects, providing the background, methodology and tools to predict the costs and benefits of these projects to the business. This book will illustrate how such techniques can be applied to shorten the technology sales cycle, increase sales effectiveness, gain competitive advantage, and increase the returns from the solutions.

As will be discussed, those who are selling IT hardware, software, and solutions are under increasing scrutiny to prove the value of their technology. Businesses are reacting to the end of the greatest period of technology growth during the Internet bubble, with a backlash, demanding that every project add to the bottom-line. IT solution providers must understand how to use the time honored financial analysis tools of business and apply the principal of ROI, directly to their products and offerings. This book will prepare the Information Technology solution provider for the questions and requirements that customers will be presenting in the months and years to come.

How Should This Book Be Read?

The Introduction by Paul Strassmann, esteemed author and ex CIO of Kraft Foods and Xerox, outlines the results of his thirty years of research and experience on IT spending and the Computer Paradox: that although technology seems to positively impact productivity, it is difficult to find the positive results in corporate performance and performance metrics; somehow, corporations are squandering their investments.

Section I – IT Spending and ROI - makes a case for why ROI is such an important topic today, discussing how we arrived at the current market opportunity and what lies ahead; Section II – Return on Investment for IT - introduces the basics of traditional ROI; Section III – the ROI Dashboard - introduces a new and improved ROI model and methodology. And the last section – Selling with ROI - provides useful tips for applying ROI to selling IT solutions. Finally, the Appendices contain a step-by-step guide to the ROI model, a sample ROI model development and Glossary.

Forward

By Bill Kirwin – Vice President and Research Director, Gartner, Inc.

Technology investments are made for many reasons. Some are good, some bad, and most pretty fuzzy. Some technology investments have paid off, some haven't, and mostly we just don't know. Information technology (IT) investments have been notoriously poorly managed from a financial perspective. Early adopters make IT investments for competitive advantage; late adopters are forced to keep up by rapid IT obsolescence. Articles in airline magazines drive IT investments, irrational exuberance drives IT investments, and IT investments drive additional IT investments.

IT was originally bought and sold as a labor reduction platform. "If we buy this system we can fire more than enough people to pay for it." But inevitably the system enabled more "work" and the workforce grew. Mea Culpa.

Then IT was sold as a productivity tool. In the 1980s "personal" productivity reigned. However, after buying billions of personal computers, it was never demonstrated that personal productivity covered either the cost of IT or improved the bottom line of the enterprise. Mea Culpa.

When the IT buyers ran out of justification ideas for IT investments, IT vendors invented solution selling. This was all about solving business problems. The solution consisted of the same hardware and software coupled with a vague notion that the vendor understood a company's business problem better than the company. Caveat Emptor.

Today, the IT investing is done in a much more demanding marketplace. IT spending is a double-digit expense in most enterprises. Almost every great idea has an IT component, and IT is often a business case unto itself. Buyers and sellers of IT need to be much more savvy, yet be able to up-sell to executive level decision makers using tried and true business cases. Newer IT specific tools like Total Cost of Ownership (TCO) and traditional financial tools such as Return on Investment (ROI) must be used in tandem to realistically depict the cost and the benefits of IT investments. Vendors are aggressively using these methodologies in competitive marketing and bid situations. Buyers need to "run the numbers" to make sure their IT investments compete successfully with other opportunities and meet the goals of the business.

Our research at Gartner has shown that a well-presented business case will not only win the funding, but will receive the funding to do the project right. Gartner's industry standard TCO methodology provides the true cost side of the equation, while a well-founded business benefits case will provide the realistic ROI analysis that is critical to today's IT investment decisions. Amen.

Introduction

By Paul Strassmann

Challenge of the Computer Paradox

The computerization of the US economy has progressed at an increasing rate. Spending on information processing equipment and software rose steadily from 18.2% of all business investments in 1987 to a peak of 46.7% at the end of 2000.i

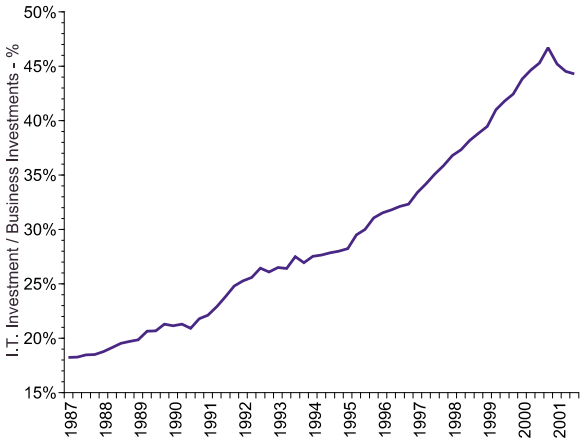

Figure 1

Since then the reliance on information technologies has fallen as disappointments with profitless results were finally realized. In view of the rising skepticism about the benefits of computerization those businesses that are now seeking to increase profits are not likely to view information technologies as their preferred investment means.ii Boards of directors and business executives are now pursuing policies that would shift from investments based on hopeful promises to investments that can depend on verifiable gains.

It is the purpose of this introduction to examine why investments in computers did not meet the past expectations of spectacular productivity gains and why overcoming the increasing reluctance to invest in information technologies represents the greatest challenge to computer professionals – and particularly to vendors – in the decade to come. We will re-visit MIT Professor Robert Solow's 1987 observation that "…you can see the computer age everywhere but in the productivity statistics." This phrase has cropped up repeatedly in the debates about the presumed benefits of computerization. Solow's conundrum of spending without visible results has now been tagged as the "computer paradox."[iii]

My purpose here is to show why the absence of a relationship between computer investments and any measure of productivity persists to this day. Indeed, the "computer paradox" is as alive nowadays as it was fourteen years ago. It will flourish until the euphoric belief in the profit-generation powers of computers becomes tempered by healthy doses of financial sobriety.

Labor Displacement

Initial computerization investments were concentrated on the mechanization of repetitious tasks of clerical and administrative personnel and resulted in rising concerns about massive unemployment of such personnel.[iv] The impact of this approach can be observed from changes in the U.S. occupational structure. From 1983 through 1999 in the U.S. the employment of administrative and clerical personnel increased only from 16.4 million to 18.7 million, or 14.2% while executive, managerial and professional personnel leaped by 73.3%.[v]

Occupation	% of Total Employment in 2000	1983-2000 Employment Growth
Executive, administrative, & managerial	14.6	83.6%
Professional specialty	15.6	64.7%
Technicians & related support	3.2	43.6%
Sales occupations	12.1	38.3%
Administrative support, including clerical	13.8	14.2%
Service	13.5	31.9%
Precision production, craft & repair	11.0	20.7%
Operators, fabricators & laborers	13.5	13.8%
Farming, forestry & fishing	2.5	-8.1%

Figure 2

As the U.S. shifted to an information-based economy, the share of compensation for the information workforce compared to total employment rose to 68.2%.[vi]

	2000 Mean Annual Wage Estimate	% of Total Wages	Estimated Wages - $000
Management & Executives	$68,190	21.1%	$1,058,240,610
Professional Personnel	$48,470	25.9%	$1,296,960,260
Sales and Marketing	$27,990	8.7%	$434,208,870
Office and Administrative Support	$26,300	12.5%	$628,096,600
		68.2%	$3,417,506,340
Service Occupations	$19,570	10.2%	$510,287,750
Farming, fishing & forestry	$18,860	0.5%	$26,950,940
Construction and Extraction	$34,440	5.1%	$256,612,440
Installation, maintenance & Repai	$33,760	3.9%	$196,483,200
Production	$26,450	6.9%	$345,437,000
Transportation	$25,630	5.2%	$258,555,440
Total, All Occupations		100.0%	$5,011,833,110

Figure 3

Most of this expense was corporate and public sector overhead, which made all cost reduction an attractive target.

Organizations found it desirable to obtain savings by substituting increasingly cheaper computers for labor demanding increasing wages. Inserting wave after wave of additional computer capital, even though these assets were rapidly obsolescent, became attractive. Falling prices for office automation were also delivering new capabilities on how to mechanize office functions. For instance, from January 1993 to the end of 2001 the prices for computers show a decline from a base of 100 to 25.4 for mainframes and to 5.9 for personal computers.[vii]

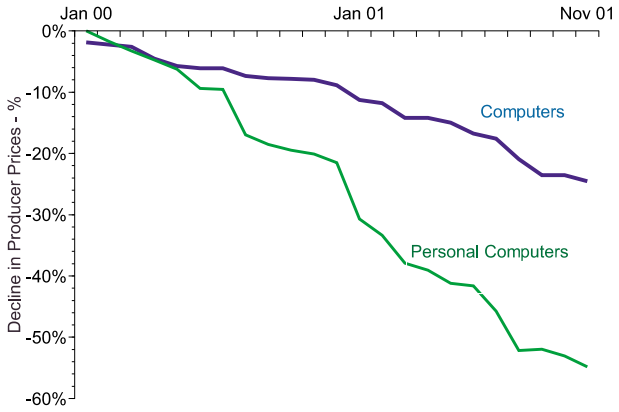

Figure 4

A popular theme that computerization would increase unemployment, especially among women clerical workers, turned out to be a fashionable figment for only a moment. In due course the clerical and administrative workforce became computer enthusiasts and embraced the increased demand for higher technical skills as an escalator into higher paying professional occupations. With increased penetration of personal computers into the workplace saturation levels have been achieved.[viii]

The widespread adoption of computer-based systems resulted in the decline of the support ratio of clerical administrative support personnel to executive, managerial and professional staff by 20%. Had the ratio of administrative and clerical personnel remained as it was in 1983, the U.S. would have had to employ an additional 9.7 million personnel. Such lower staffing levels were then claimed as cost avoidance by computer vendors and computer experts. In this way "savings" of about $400 billion per year were used as justification for more spending. Whether such a claim is credible is arguable. Nevertheless, the fact is that throughout the 1970's and 1980's most of the investment proposals for added computer capacity were rationalized though such "cost avoidance" logic.

It just happens that the $400 billion of clerical and administrative personnel cost avoidance covers only a half of the total annual corporate spending for information technologies. Before such savings could be credited as a gain to payoffs from computer investments one must also consider what happened to other jobs. If one compares the 1983 with the 2000 occupational data, the managerial and professional jobs rose by 17.3 million. This cost anywhere from an additional 84% to 160% in compensation per employee. Of this 17.3 million about one third tracked the growth of the workforce. However, 10.5 million of the growth was the result of a shift of personnel from jobs previously found in lower earning employment categories. This shift of people into higher paying jobs far exceeds the benefits that were claimed as "saved" by avoiding the hiring of additional clerical and administrative people. Although the introduction of computer automation made it possible to upgrade the workforce all of the savings evaporate when they are examined from the standpoint of the overall corporate cost structure.

Decades of computer investment were initially propelled by the theory that capital would displace labor, such as was the case during the industrialization of the U.S. at the beginning of the century. As the U.S. approached the end of this century it became apparent that both the headcount as well as the average cost of the information workforce was rising much faster than the gross domestic

product. Thus the paradox has become not only an economic problem, but potentially the source of a severe misallocation of the workforce unless ways are found to make the enormously expanded professional and managerial occupations more productive.

In the past he migration from farms to factories and then from factories into offices was accompanied by capital investments that delivered enormous gains in labor productivity. The relocation of employees from clerical and administrative jobs into professional and managerial positions does not show a similar pattern. Though more than 90% of the information workforce now use computers, many professional and managerial personnel cannot get their job done in less hours or at a lower cost. The paradox is realized in that it now takes about 20 billion more hours, at salaries that have risen twice as fast as for the rest of the workforce, to get work done.[ix] In another example, retail banking, the sector that has invested most heavily in computerization and that is presumed to be fiscally most prudent has experienced a drop in its labor productivity.[x]

The computer paradox was not exorcised by the labor cost displacement theory. Perhaps the answer can be found elsewhere since the U.S. economy has been enjoying an unprecedented era of prosperity while computerization was picking up pace.

Asset Displacement

To justify spending on IT, computer advocates frequently offered reductions in corporate assets as savings. Faster inventory turns, improved capacity utilization and just-in-time supply management were used as examples of the favorable effects on corporate return-on-assets. To what extent could such claims be substantiated? The only trustworthy method for checking if computerization has allowed U.S. corporations to operate with lower assets is to examine how many net assets (e.g. total assets minus total liabilities) were necessary to support every dollar's worth of revenues since 1990 when the era of most intensive installation of computers took place. The results were contrary to expectations. The median ratios of net assets-to-revenue increased by 47%.[xi]

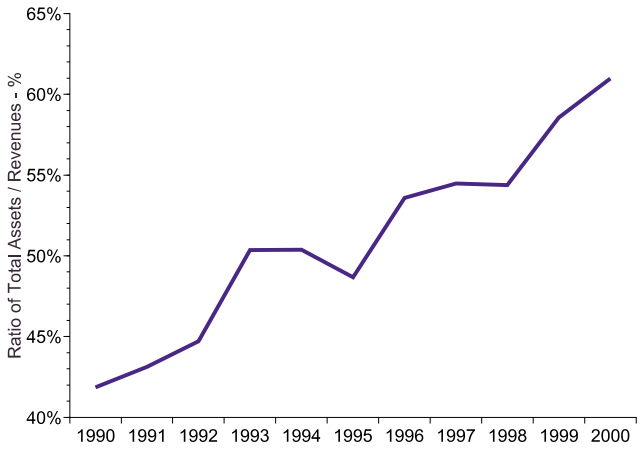

Figure 5

Despite a shift of assets from corporate balance sheets and an expansion in debt, there is no evidence that computerization delivered what was widely promoted and also accepted as an article of self-evident truth.

Overhead Displacement

The next most often cited reason of the benefits of computerization is based on the assumption that direct communications among employees, improved links with customers and suppliers that

simplify workflow, increased the sharing of knowledge and the flattening of hierarchical organization structures will surely deliver lower overhead costs. The insertion of computers into the corporate structure would thus reduce what economics call "transaction costs" which are incurred in the process of managing the movements of goods from sources of supply to consumers. Corporate transaction costs are reported as "sales, general & administrative" costs. The only trustworthy method for checking if computerization has allowed U.S. corporations to operate with lower administrative expenses after a decade of computerization is to check the ratio of sales, general and administrative costs to the costs-of-goods sold. Contrary to expectations, the median and the weighted average of this ratio rose by 42% and 17% respectively from 1990 to 2000.[xii]

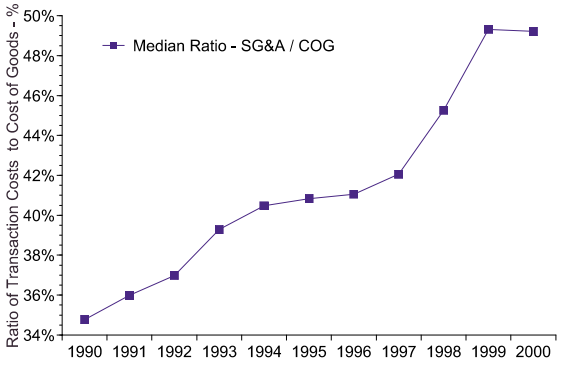

Figure 6

The evidence is now overwhelming that during this period of steadily increased investments in computerization U.S. firms have not reduced the median ratio of information management costs (as defined by the reported sales, general & administrative expenses) to value-added (as defined by subtracting purchases from revenues). For the majority of U.S. firms the overhead ratios – consisting mostly of information processing costs- were higher at the end of year 2000 than they were in 1983. But, median trends do not tell the full story. One must examine each company individually to find out whether increased information management costs nevertheless delivered increased value as a result of a better-paid and therefore more knowledgeable staff.

The available financial information is inadequate in sorting out whether the true benefits of computerization accrued not from substitution of clerical and administrative labor but from rising numbers of managers and professionals acting smarter. As the computer investment started sputtering a number of academics and consultants argued that computerization would unleash increased returns from "knowledge capital." Accordingly, additional well-paid brains, supported by networked workstations, would generate added value and thus deliver returns from intellectual assets. I find it difficult to deal with such arguments because rising profits in the U.S. since 1990 are also a reflection of rapidly decreasing costs of capital, favorable currency and lowered costs of imported goods.

Any savings could be then invested in expanding an increasingly costly managerial overhead. But, the total increase in such personnel does not adequately explain its total impact on profits. During an era of unprecedented prosperity the compensation of this group increased steadily at the annual rate of 18.9% while the average compensation for everyone else averaged only 5.2%.

What it Means

There is little doubt that consumers benefited from improved turnaround in processing routine business transaction thus delivering remarkable improvements in consumer services. If the benefits of the demonstrable applications of information technologies are each examined in isolation, they represent enormous gains in productivity and therefore should have generated corresponding huge gains in profits. Unfortunately, the improvements in productivity did not materialize. Professor

Robert Solow was right when he observed in 1987 that computerization has become pervasive but without evidence that it delivered anticipated benefits.

The period during which IT spending escaped even rudimentary oversight is now gone forever as corporations are increasingly pressed to increase profits that would match their overblown stock market valuations.[xiii] Information technology executives as well as their vendors will have to devote now at least as much time to communicating about verifiable business benefits as they spend in promoting technological achievements. It is hoped that his publication may be received as a good starting point for making progress toward such an objective.

Paul A. Strassmann
New Canaan, Connecticut, January, 2002

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[i] Bureau of Economic Analysis, Table 5.5. Real Private Fixed Investment by Type, [Billions of chained (1996) dollars], December 21, 2001

[ii] McKinsey's Global Institute, IT and Productivity, 2001. The report found that IT investments did not have an impact on productivity in 53 out of 59 economic sectors; the relationship between IT and productivity improvement is murky and except in rare cases, IT did not increase labor productivity.

[iii] Solow, Robert M., We'd Better Watch Out, The New York Times Book Review of The Myth of the Post-Industrial Economy, July 12, 1987.

[iv] Hearings before the Committee on Science and Technology, U.S. House of Representatives, April 7, 1983 were convened to address the prospect of massive unemployment among clerical and administrative workers because of computerization.

[v] Current Population Survey, Bureau of Labor Statistics, December 2001

[vi] Bureau of Labor Statistics, U.S. Department of Labor, 2001. Occupational Distribution Tables.

[vii] Bureau of Labor Statistics, U.S. Department of Labor, Producer Prices Series: PCU3571. PCU3571#14,December 2001.

[viii] Cho, M.M. and Neiman,B., *Computers, Why the Party is Over*, The McKinsey Quarterly, 2002 Number 1

[ix] Bureau of Labor Statistics

[x] Olazabal, N.G., Banking: The IT paradox, The McKinsey Quarterly, 2002 Number 1.

[xi] Standard & Poor's Compustat, September 6, 2001. Data for 9,559 U.S. firms

[xii] Standard & Poor's Compustat, September 6, 2001. Results for 6,603 U.S. firms.

[xiii] Hunt, B., *IT mismanagement costs businesses*, Financial Times; Sep 27, 2001. A survey of senior board members of 200 UK companies found that about half did not know what their IT budget was; 80 per cent had little idea of what cost-saving they achieved through their systems. The waste is attributed to a lack of consideration at board level, "renegade" IT acquisitions outside the usual IT budget, overly bureaucratic procurement procedures, and an absence of direct management accountability for IT spending.

Section I – IT Spending and ROI

IT Spending and the Internet Bubble

"It hasn't taken long. In just a few short months, information technology has gone from hero of a record-setting 11-year boom to scapegoat of a looming recession." - Ann Harrison, Business 2.0

The marketplace for Information Technology (IT) changed dramatically in 2001. Prior to the bursting of the speculative Internet bubble, IT expenditures reached record highs for almost every industry and organization. The federal government says U.S. businesses devoted 47% of all capital investment funds last year, or $664 billion to IT. That percentage is twice what it was in 1991. Pundits such as Paul Strassmann, recognized author, Director of defense information at the Pentagon and chief information officer at General Foods, Kraft and Xerox, warned that "If this growth rate continues, IT will overwhelm all other investment needs and diminish the availability of funds needed to cope with, say, a possible energy crisis or increased global competition."

Euphoric company managers could not implement solutions quick enough to increase capabilities and drive promised productivity improvements. Information technology spending rose by 9.4% in 1999 and 11.1% in 2000, initially fueled by Y2K worries, soon after followed by Internet fever. [1] For IT vendors, sales professionals and consultants, times were good. Contract values increased, commissions reached record levels, and sales cycles of major IT expenditures were reduced to an average 4 months for major purchasing decisions. Indeed, it was a good time to be selling IT solutions and be an owner of technology stocks.

In 2000, capital spending for hardware alone exceeded investments made in every other major economic sector. But as studies from the early eighties to today vividly highlight, IT capital expenditures are only the tip of the iceberg when it comes to the total cost of ownership (TCO). Computer hardware and software assets account for only a fraction of the TCO. Each dollar of assets requires another $4 in labor costs to manage, support and maintain it. This amounts to a total IT budget in 2000 of about $2 trillion worldwide, twice the total of all corporate profits. At the prior growth rates, if the current trend had continued, IT spending would have grown four times faster than the recent rise in the gross domestic product.[2]

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[1] Research by IDC as reported in Business Week, December 17, 2001

[2] Paul Strassmann research on the macro-economics of IT spending and Information Economics (see bibliography)

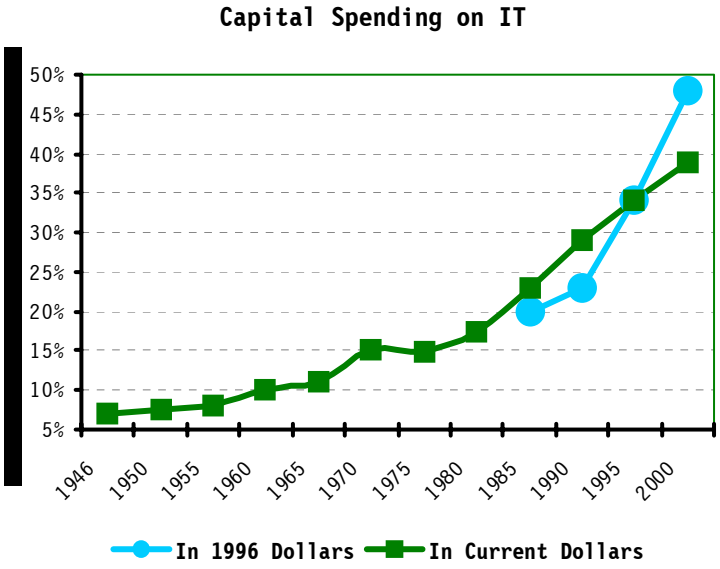

Figure 7: Capital investments in IT as a percentage of all business capital investments have increased during the past 50 years, but the federal government says those investments have been most pronounced during the last decade. Source: Bureau of Economic Analysis

As Paul Strassmann warned: "Even if IT budgets were to maintain the same share of investment funds as they did last year, the value of computing relative to everything else would keep exploding. The economy would be plowing its capital surpluses to keep expending its information-processing power. That would dwarf the worth of every other capital investment such as real estate, transportation equipment and energy exploration. Doing so would leave a steadily diminishing supply of capital funds to finance a growing list of international and domestic economic challenges." Thankfully, the market has recognized this fiscal irresponsibility.

Current growth projections from IDC indicate that US spending on IT is expected to contract 3% in 2001, and rebound to 5% in 2002. Giga Information Group announced more severe cuts in the 5% in 2001, rebounding to 4% in 2002 (down from the more than 20% seen from 1999 to 2000). Most financial analysts provide more conservative figures than the technology analysts, indicating that these growth rates will remain modest, bumping along the bottom for the next five years.

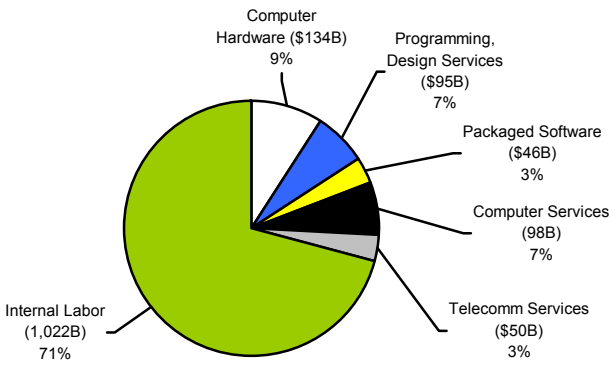

Figure 8: According to the Statistical Abstracts of the United States, Table 906, spending on IT in the US in 1999 topped 1.4 trillion, with only 12% of the spending on hardware and software assets, 7% on outsourced computer services, and a whopping 71% on internal labor.

As the current investment cycle in new Internet technology ends, so does the frenzy surrounding IT investments. The manic cycle of Internet investments led to the highest of highs. As the cycle turns from euphoria to depression, this low promises to be longer and deeper than any prior cycle.

The Party's Over

"Ask 10 of your colleagues what e-business issue burns hottest today, and nine of them will tell you ROI. Conventional wisdom holds that in a slowdown, CEOs, CIOs and shareholders alike are watching every IT penny that goes out the door and making sure an equal or greater number of pennies flows back in. Especially during this slowdown, which follows the most freewheeling IT spending binge in business history." - David Joachim, senior managing editor of *InternetWeek*

As revenues and profits fall and funds are sorely needed to bolster the failing bottom line, IT budgets are bearing their fair share of the cuts. In a recent Alinean survey, more than 60% of the fifty Fortune 1000 company executives interviewed said that investments in new technology weren't paying off as they had hoped.[3] Although technology investments continued to rise, most often in order to gain competitive and strategic advantage and strengthen market share in a fiercely growing economy; many of the projects did not yield the expected fruits. The study attributed much of the blame on the failure to align the investment in IT with specific business value creation. Many of the executives interviewed had stopped performing formal analysis of IT investments without documenting specific and measurable goals for each project. Many of the improvements failed to deliver, and without a method to measure the performance, little was, or could be, done to detect issues and re-capture some of the missing benefits. As well, without specific goals, it is not necessarily that the planned projects failed, but that no measure of success or failure could be easily derived. This reckless abandon is maturing out of fiscal restraint into a new healthier environment of much stricter corporate planning and accountability.

This is not the first cycle where the promise of the new technology, outstripped the reality of actual returns. The euphoric cycle has been repeated several times for the latest technology solutions of the day, starting with automated payrolls in the 1950s, mainframes in the 70s, PCs in the late 80s, client/server and distributed computing in the early 90s, and most recently the Internet bubble of the late 90s.[4] Each investment cycle generates a wave of new start-ups, massive venture capital funding, unconstrained IT investments, followed by periods of intense vendor consolidation and overly constrained spending when the bubble bursts.

"If you add up all the venture capital over the past 20 years, 70% of it was invested in 1999 and 2000". - Tony Perkins, Founder of *Red Herring* Magazine

Many journalists have claimed that the Internet is dead. Similar statements were made regarding the driving technology in every prior investment cycle. The Internet has fundamentally changed the way we do business, conduct research, share information and communicate. It may not have as large an impact as what was predicted during the euphoria, but it is certainly not going away. The reality is however that the spending party is over for the Internet gold rush, as we enter a much more pragmatic cycle of technology spending. The traditional nature of technology spending cycles, coupled with the manic rise of the capital markets through an unprecedented period of prosperity, promises that this current downward cycle may be much more extreme than prior cycles. With the

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[3] Alinean is an ROI researcher and development company focused on raising awareness of ROI as a valuable analysis and selling tool. The study was conducted via a brief phone survey during the fall of 2000, seeking answers to two questions: Are recent IT investments resulting in expected paybacks? If not, why are the paybacks not being achieved?

[4] Some would argue that the cycle even pre-dates computers, pointing to the fervor surrounding radio in the 1920s, a period where the recovery took twenty five years after the boom ended to reach similar levels of corporate value.

euphoric highs achieved with the Internet bubble, it is certain to bring us to the lowest of lows before this cycles plays out to the next euphoric rise in the next hot technology.[5]

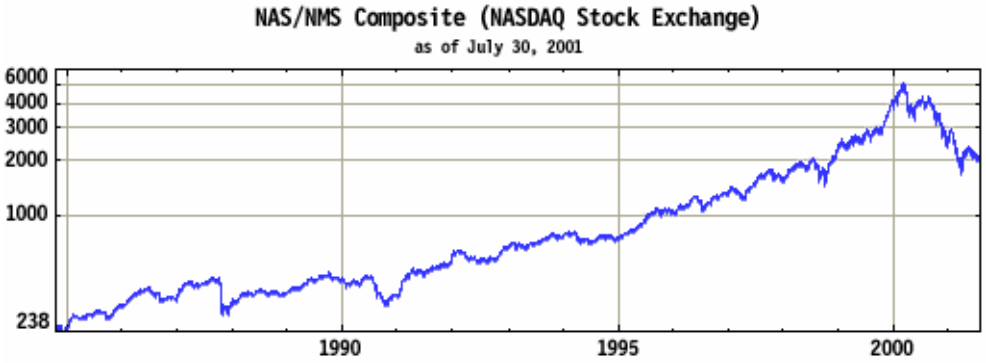

Figure 9: Nasdaq market performance over the past sixteen years highlights several boom bust cycles including the Internet bubble in mid-2000, the client-server computing bubble in 1991, and the PC bubble in 1987. This is only a portion of the six or more technology boom-bust cycles over the past 50 years. As technology becomes more important to the economy as a tool, and in some instances becomes the economy, these boom-bust cycles will have a further impact on the economic well being of nations and individuals.

Start of Investment Cycle	Technology	Estimated Investment
1956	Automated Payroll	$100 million
1963	Data Centers	$1 billion
1969	Time Sharing	$5 billion
1975	Mini-computers	$25 billion
1981	Micro-computers	$150 billion
1988	Client/server	$650 billion
1996	Internet	$ 3 trillion
Est. 2003	Network Services	Est. $6 -15 trillion

Figure 10: Prior investment technology cycles over the past 50 years indicate an alarming escalation in the amount of each new investment cycle, and a shortening of the time between major cycles. The next cycle of network services is being promoted by major IT solution providers such as Microsoft with Dot Net, Sun with One Net, and IBM with WebSphere and GlobalGrid.

[5] When in the downturn it is very difficult for anyone to predict what the next hot technology cycle will be. Will the investments by Microsoft, IBM and SUN move the next generation of computing to network services – component based applications that will be rented as needed, and will communicate and share information easily? Will the dream of Internet everywhere be realized with wireless, providing networked computing power anytime, anywhere and for any purpose? If this current cycle is anything like that of the brief 1992-1993 downturn, the next cycle will not become apparent for another two to four years to all but the most visionary. And, with the amount of money still in venture capital funds even with the downturn, it has the potential to dwarf the prior investment cycle.

The IT Spending Paradox

"We see computers everywhere except in the economic statistics" – Robert Solow, MIT, 1987

"IT investments did NOT have an impact on productivity in 53 out of 59 economic sectors" – McKinsey Report Finding on IT Productivity – 2001

Much has been written about the impact of information technology on productivity, and how this impact was the main catalyst behind the biggest boom in US history. On an individual basis, IT has provided us with services, products and lifestyle advances that were unimaginable ten or twenty years ago. Who imagined being able to surf through and order from online catalogs, view streaming video of breaking news anywhere in the world, obtain stock quotes on a PDA, or manage your own stock portfolio online like a professional. As business people, we can proactively obtain news that matches our interests, stay connected during travel, collaborate with teams worldwide using e-mail, instant messaging and on-line conferencing, build presentations and self-publish white papers and books. Few among us would argue that as individuals, we are empowered as never before to create, connect, communicate, collaborate and produce.

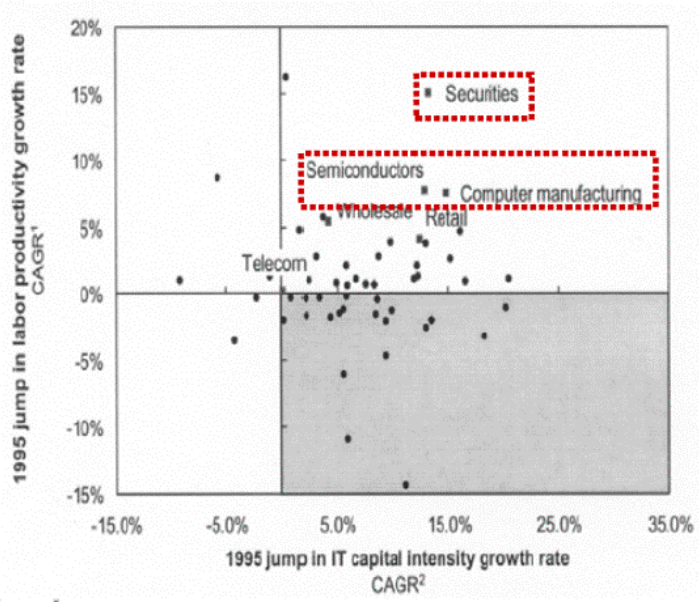

Figure 11 : McKinsey's widely read study from 2001 challenged the status quo understanding that increases in IT spending corresponded to increases in corporate productivity.

So this individual productivity should be easily measurable in the corporate bottom-line – right? Unfortunately several recent studies indicate that although individual productivity has improved, the corporations have squandered the gains somehow. Unfortunately when you run the numbers, there is no correlation between investment in IT and profitability. Although some companies achieve spectacular results through their use of IT systems, higher investment in IT per employee does not result in higher return on equity.

The headlines read "New Economy – What New Economy" and "Deepening Wrinkles in New Economy". A recent study by management consultancy McKinsey was the catalyst for such headlines, questioning the impact of IT on US Productivity Growth. The study analyzed the impact of IT spending on productivity, using government labor and IT spending statistics to quantify the gains and determine the correlation between spending and corporate productivity improvements. Examining productivity growth and IT spending growth by industry produced little correlation between the two. The results of the study showed that

1. In 53 out of 59 industries, increased IT spending did not result in a corresponding jump in productivity;
2. The relationship between IT and productivity improvement is murky;
3. Except in rare cases, IT did not produce dramatic increases in labor productivity.

The productivity leading industry sectors that did see a positive productivity return on their IT investments included Securities, Semiconductors and Computer Manufacturing, Wholesale Retail and Telecom, and even these results were modest at best. [6]

More detailed studies by Paul Strassmann using corporate financial statements and examining over 4,000 companies on an individual basis indicate similar startling results – the computer paradox.[7] Rather than looking at government data on the growth in IT spending compared to increases in productivity, a perhaps better methodology, as proposed by Mr. Strassmann, is to examine the financial statements for public companies and compare information management investments, the input, verses a measure of corporate performance, the output. This can be expressed as:

Value of IT = corporate performance / information management investment

However, there is much debate on which single industry standard measure of company performance to use. Is it the company's output net profits, how many widgets are produced, how many transactions are generated, or is it the return to shareholders in terms of market capitalization?

Since each industry produces different goods, looking at corporate production is not a good measure for cross industry analysis. Using market capitalization relies on the stock market to effectively price companies on their value, meaning that all investors must be rational and agree on risk. Using market capitalization unfortunately leaves too much to the whims of investor sentiment. High market capitalization, such as the Internet boom period can falsely predict a high contribution from IT, and in poor times, such as 2001, the value of the investment may be lost in poor market performance. As well, market capitalization changes so quickly that results are scrambled faster than they can be printed.

Paul Strassmann espouses the use of Information Productivity as the single best indicator of determining the resultant value from IT investments. Information Productivity is a value measurement of IT comparing the company's output, in terms of Economic Value Add (EVA), against the input of Information Management[8]. Those with higher EVA and/or lower Information Management spending perform best.

Information Productivity = EVA / Information Management Spending[9]

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[6] The study by McKinsey has several issues: 1) Getting the most from IT investments is an individual company accomplishment. Examining IT investments and productivity for an entire industry sector tends to the average the performance amongst those that deployed technology well, and those that spent much money but are mismanaging the investments; 2) Financial reports not Government statistics are the best measure of spending and performance. The McKinsey report uses government statistics that are documented in the analysis as inadequate or contradictory – the same statistics used by Alan Greenspan (meeting in April 1999) to illustrate how IT was making a huge impact on productivity; 3) The study concentrates on an obsolete view of labor productivity (as measured in labor hours per capita or in terms of persons employed in production). Corporate management examines the contributions of IT from the standpoint of contribution to profits

[7] Information Productivity – 1999, Information Economic Press

[8] When examining a company's spending, purchases and direct costs are factored out of total spending to determine Information Management Spending, equivalent to Sales, General and Administrative (SG&A) expenses. For a typical company, direct costs are 17%, purchasing is 57%, and SG&A is 26%. Total information management spending should not be confused with total IT spending, which amounts to only 3% of a typical company's budget.

[9] Information Productivity is a registered trademark of Strassmann, Inc.

EVA is well recognized as an effective measure of the value a company derives from its assets. As defined for our use, economic value-add (EVA) may be expressed as:

EVA = accounting profit – payment for shareholder capital (rent)

Where the Payment for shareholder capital is equal: cost of capital * shareholder equity

Where shareholder equity equals assets minus liabilities

A comparison of the Information Productivity of several technology companies is as follows:

Company	Information Productivity	Economic Value Add per Employee	IT Spending per Employee	IT Spending as a % of Revenue	Return on Equity
Oracle	77.19%	75.6018	$18,393	7.50%	97.5%
Intel	57.12%	58.4469	$16,381	4.18%	28.2%
Microsoft	50.13%	111.7421	$40,231	6.85%	22.8%
Dell Computer	44.06%	35.7955	$10,239	1.48%	31.4%
Apple Computer	24.00%	32.0112	$17,844	2.62%	19.1%
Hewlett Packard	18.05%	19.9005	$15,572	2.83%	26.0%
AOL Time Warner	16.67%	20.8855	$17,516	3.82%	20.0%
Gateway Computer	8.63%	5.3602	$8,411	2.16%	10.1%
Network Appliance	6.03%	9.7317	$3,134	2.04%	15.4%
Cisco	1.25%	2.5043	$29,402	5.28%	10.1%
Motorola	-11.05%	-7.4496	$8,473	3.31%	7.1%
Compaq Computer	-12.22%	-13.8685	$13,415	2.22%	4.7%
Cirrus Logic	-104.15%	-176.2642	$21,756	4.84%	-289.0%

As can be seen from this limited sampling, the amount of spending per employee and as a percentage of revenue varies drastically from company to company. As well, so does economic value add, return on equity and the ratio of EVA and return on equity to IT Spending. To maximize information productivity, the impact of information spending on profits needs to be maximized. As well, a company can tightly control costs, aligning IT to business objectives to maximize returns from each investment.

As an example, let us look in detail at the Information Productivity performance of Dell Computer. Dell relies incredibly on its technology infrastructure – for its direct B2E sales channel, as a sophisticated build to order production management and supply chain management system and as an information worker platform. Although one of the most reliant on technology amongst the computer system solution providers, Dell is the most frugal when it comes to information technology spending – amounting to only 1.48% per revenue and $10,239 per employee, in contrast to HP at 2.83% and $15,572 per employee.[10] A combination of strong return from technology investments and tight IT budgets leads to strong value from IT for Dell. Of course low budgets can be the result of lack of investment in new products and a lack of investment in new IT projects, which can in turn yield long-term vulnerabilities. With the PC and server markets growing more slowly, Dell may need to spend more on IT in the near term to reposition into more attractive markets such as storage and services.

[10] It should be noted that HP still has a healthy Information Productivity ratio of 18.05%, and that its business consists more substantially of software and services than Dell Computer.

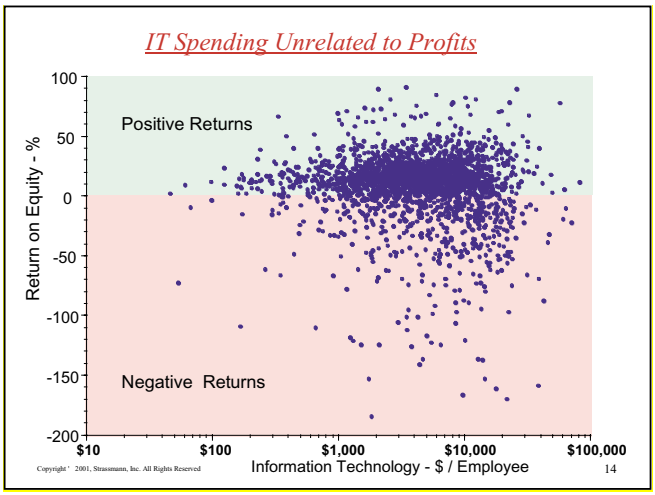

Figure 12: Looking at return on equity (defined as profits / equity) and comparing it to IT spending per employee one would expect to see results that indicate low spending on IT leads to lower returns on equity, while higher spending on IT leads to higher returns. This should appear as a diagonal line moving from low on the left hand side, to higher on the right, whereby as spending per employee increased, so did the return on equity. However, as this scatter diagram indicated, no correlation exists between IT spending, and performance as measured by return on equity – meaning that many companies that spend little on IT manage to still maximize their investments (companies like Dell Computers), while others with large spending per employee somehow manage to squander the capital (like Cirrus Logic). Also notice that return on equity is slightly positive on average, but this accounts for return on equity being equal to cost of capital – meaning that in real terms, the nexus is adjusted to 0%.

Examining the results of over 4,000 companies worldwide reveals that there is little correlation between IT spending and EVA. From a macro-economic viewpoint, those that spent the most on IT did not always see superior results in corporate performance. In fact, over 40% of the companies did not have positive return on equity at all, and of the ones that did, those that had low IT expenditures per employee were just as likely to achieve positive returns on equity than those with high IT spending per employee.

Many would concede that measuring a company's performance using EVA does have its limitations. A company with a high EVA might have products that are late in their life cycle –cash cows that are being effectively milked today to produce high profits in the near term, but who may be on their way out, due to lack of investment in future projects. With little investment in the future, the company may be in trouble over the long term. Conversely, lower EVA may represent a company making an investment in the future, where today the return on assets is low, but profits will indeed be realized in the future. One remedy is to not look at EVA for a single year, but to look at EVA over time, as a trend compared to IT spending, in order to account for corporate and product lifecycles.

Since EVA has some issues, is there perhaps a better comparison metric to determine the value of IT – one based on market capitalization? Many, such as renowned technology author Geoffrey Moore believe that market capitalization – stockholder value - is a more effective way to measure performance, however it is extremely volatile and in the short term influenced by investor sentiment and other emotional factors.

In a way to alleviate some of the volatility, and also incorporate risk adjusted returns, consultants Stern Stewart created the Wealth Added Index, a ranking of 5,069 of the world's largest public companies by shareholder wealth created between June 1996 and June 2001. Central to the WAI rankings is the idea that a company creates value for shareholders only if their returns to investors - from share-price rises and dividends – exceed their "cost of equity" (defined as the minimum return that investors require for putting their money in risky shares). [11] In the rankings, those companies

[11] The Economist, December 1, 2001

whose share values are growing more than the return required by investors to cover their cost of equity are adding value, while those that return less over time are destroying it.[12]

Comparing several U.S. companies' Stern Stewart Index of Wealth Added Index to their IT spending produced similar non-correlated results between IT spending and value.

Sampling of Top US Companies

Company	Stern Stewart Wealth Added Ranking	Wealth Added $ billion	Cost of Equity (%) (Annualized)	Total Shareholder Return (%) (Annualized)	IT Spending per Employee	IT Spending as a % of Revenue
General Electric	1	226.8	10	28	$5,636	1.97%
Microsoft	2	149.5	11	37	$40,231	6.85%
Wal-Mart	4	118.3	9	32	$3,147	2.17%
AOL Time Warner	10	67.8	9	81	$17,516	3.82%
Oracle	11	65.5	11	34	$18,393	7.50%
Home Depot	14	50.5	9	32	$5,040	2.64%
Pfizer	16	43.6	9	29	$24,235	7.38%
Dell Computer	17	42.9	10	75	$10,239	1.48%
Johnson & Johnson	22	34.6	9	17	$19,374	6.55%

Sampling of Bottom 25 Companies

Company	Stern Stewart Wealth Added Ranking	Wealth Added $ billion	Cost of Equity (%) (Annualized)	Total Shareholder Return (%) (Annualized)	IT Spending per Employee	IT Spending as a Percentage of Revenue
Hewlett Packard	5048	-24.2	10	7	$15,572	2.83%
Cisco	5055	-31.5	10	24	$29,402	5.28%
Network Appliance	5058	-37.2	10	49	$3,134	2.04%
Motorola	5060	-46.5	10	-4	$8,473	3.31%
Coca-Cola	5066	-86.8	9	-1	$34,336	6.19%
Lucent	5067	-100.5	10	-7	$10,930	4.07%

Although our sampling using the Wealth Added Index is small, a comparison of these results indicates again that the level of IT spending does not result in wealth added for shareholders, with no correlation from companies spending more on IT to the companies in the top 25 of wealth added verses the bottom 25.

Whether you use productivity figures from the government, EVA from SEC filings, market capitalization or shareholder wealth - Regardless of the comparison metric, it is difficult if not impossible to find a correlation between IT spending and value. Although this is true at a macro-economic level – it is still possible to make money and increase shareholder value from IT investments.

[12] The required return beyond which the shareholder will gain additional wealth is calculated as the cost of equity using the Capital Asset Pricing Model (CAPM).

The Information Economic Paradox

"Spending on information technology was not based on the laws of economics, but was an arms race. People spent money regardless, because they believed that if they didn't they would fall behind competitively. It was driven entirely by panic that somebody would outsmart them. I don't blame chief technology officers alone, because the whole of management over-focused on IT." – Paul Strassmann, *SURVEY - FT-IT REVIEW: Watch the economics and the risk, not the technology*, December 2001

As these studies highlight, IT spending alone does not result in value. Return on investment from IT needs to be managed. CFOs and IT executives are under pressure to cut costs, and with studies such as these highlighting fundamental issues with the prevailing wisdom on productivity and value from IT, it will become harder for these executives to justify continued investments without proof of returns. A company that spends wisely - even if sparsely - on IT will see its performance enhanced. A company that spends indiscriminately on IT will see its performance diminished, because IT will merely amplify its poor business practices.

Unfortunately, most IT solution providers act like arms brokers, selling the latest greatest hardware to one country, then walking to the neighboring country and selling similar arms based on fear. Now with IT budgets under intense scrutiny and the overall impact from investments being questioned – fear will not be a motivating factor for most CIOs as it was in the boom period.

So what are the net results of these reports and new awareness? Budgets already under intense pressure will come under additional scrutiny. CIOs will attempt to counter the computer paradox study results without the tools to do so effectively. The next generation IT vendor will need to step up to help executives understand how to prove the value from IT investments, helping them to select the newest highest yield solutions and maximize returns over the life of each investment. The move from suppliers in an arms race to mercenary in information competition will not be an easy one for many solution providers.

Trends for Information Technology Providers

"Businesses are done with mere technology. From now on, the role of the chief information officer is to make money" – Paul Strassmann

The bubble burst has led to a measurable cut in IT spending. Coupled with the lack of measurable productivity improvements and profits from prior IT investments, solution providers have their hands full. This environment is incubating several important trends that every vendor, executive, sales professional and consultant should be aware of:

- **Extending Life of Investments** – as budgets are reduced, and IT executives recognize the negative impact of current build and junk cycles, innovation becomes secondary, and the life of software and hardware investments will be greatly extended. For desktop computers, the useful life will return to five years, from the three year standards of last year – a 40% increase in lifecycle. For solution providers that rely on upgrade cycles, the extended lifecycle will force them to cost-justify upgrades sooner, and look immediately for alternative revenue streams such as outsourced services
- **Consolidating Operations to Gain Control** – During the go-go period, projects and assets proliferated at a record pace. Companies could not deploy servers and software quick enough to meet the demands of new applications, on-line customers, connected supply chain partners and knowledge workers. IT executives are awakening to the proliferation of and lack of standards in these distributed assets. The IT executives are now forced to build plans to standardize and consolidate operations and assets in order to cut costs and re-gain control.

- **Shift to services** – over 70% of an organization's IT costs are internal labor resources, a large fixed expense with much risk. Many solution providers have recognized this trend and seek to sell hardware and software as a service. New programs from vendors such as Microsoft Dot Net and SUN One Net seek to make software a flexible and scalable component-based, on-demand service. Compaq's Computing on Demand (COD) program - and competing programs from HP, Dell, Storage Networks and IBM - turn traditional corporate computing assets such as personal computers., messaging and storage into a scalable demand-based solution for a fixed monthly fee - including not only the asset itself, but all management and support resources, as well as aggressive service level guarantees. Outsourcing represents the largest single opportunity ever presented to solution providers, and such offerings from the major players will evolve to help promote the trend.
- **Helping the CIO become a leader rather than a manager** – although the near term demands on the CIO is to cut costs and improve operational efficiency, new studies indicate that it is not operational efficiency that delivers corporate results, rather it is competitive advantage and strategic positioning. To be successful, the vendor needs to recognize that they need to become a strategic business partner rather than an infrastructure provider, and they need to help the CIO achieve strategic capability and importance. If IT is to achieve ultimate value for the organization, it must be a vital component in achieving corporate goals, rather than just a cost saving utility.

Total Cost of Ownership studies by Gartner and other analysts have pointed out since the late 80s that the cost of owning a computer asset such as a desktop computer is much more expensive than the asset itself.[13] Although the TCO for technology solutions has improved over the past ten years, it is still more expensive than anticipated – as an example, over $6,800 per PC per year for a typical Windows 2000 workstation. Most of the costs are not for the hardware and software, but for labor to manage and support the PCs, both via formal support - the cost of IT staff to manage and support the assets, and informal support – users supporting themselves and each other in lieu of seeking help from the IT staff and service desk.

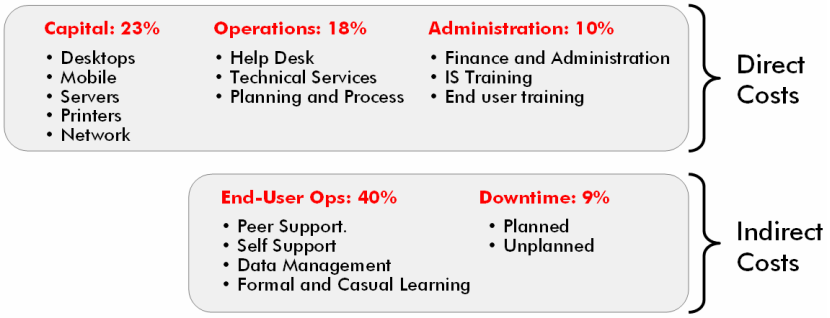

Figure 13: The annual TCO per Windows 2000 PC is estimated to be $6,845 according to Gartner. In their studies on TCO, the cost of the hardware and software consumes only about 23% of the total cost of ownership. The rest of the costs, some 7% are labor related, with the IT and support desk staff consuming an additional 28% (operations and administration), and hidden costs from end user operations – users time spent managing their PCs themselves, as opposed to seeking and using formal support consumes a whopping 40% of the TCO. Because the vast majority of costs are tied to labor related costs, and 49% is hidden in end-user operations and downtime, PC TCO remains unpredictable. CIOs are seeking ways to outsource the labor and hidden cost risks to solution providers.

[13] The Father of TCO, Bill Kirwin – VP Gartner and author of the forward to this book, began studying the TCO of desktop computers in 1988 to answer the question – what does it really cost to own and operate a computer throughout its lifecycle. Everyone at the time was promoting how inexpensive PCs were. To everyone's surprise, including the researchers, by the time the costs were tallied, the total ownership costs were some 4 times more than the cost of the hardware and software.

Using revenue figures for the US on total IT spending, computer hardware, packaged software and telecommunication services represent only 15% of the total spending on IT. Design and computer services represent a growing 14% of the total IT market. Of startling importance is the internal labor each US company devotes to IT – some $1 trillion annually – 71% of the total.

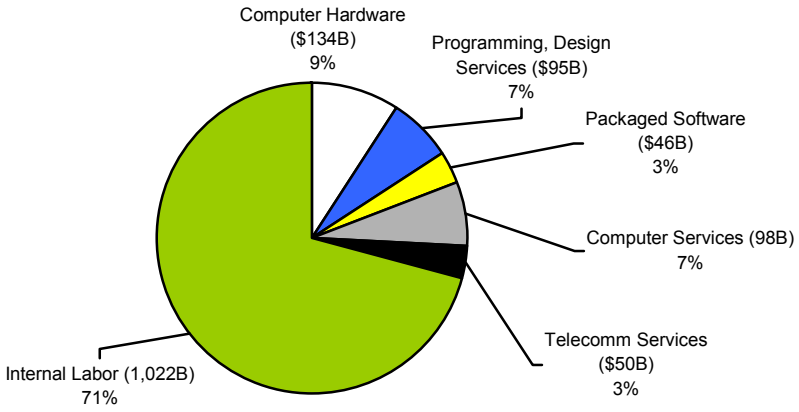

Figure 14: According to the Statistical Abstracts of the United States, Table 906, spending on IT in the US in 1999 topped 1.4 trillion, with only 12% of the spending on hardware and software assets, 7% on outsourced computer services, and a whopping 71% on internal labor.

Extending Asset Lifecycles

"The great majority of enterprises are and will be much more conservative and cautious about their IT investments, focusing on leveraging their existing IT systems more effectively and making them more secure, acquiring new applications and infrastructure only when they deliver tangible benefits, and avoiding large-ticket capital investments whenever possible." - Giga Information Group as reported in *ComputerWorld*

CIOs are now faced with edicts to cut costs. As a direct result, solution providers are facing postponed projects, delayed asset purchases, and requests to cut back on annual service contracts. At the same time, the CIO is scrutinizing their staffing levels – seeking to cut headcount, but only as a last resort – after all the blood can be squeezed from each vendor.

One of the first cost saving measures is to extend the life of the current assets. In recent years, portable computers were rotated out of service every 30 months, and desktops every 36 months. As well, operating system and application upgrades were forced because of the year 2000 issues.

A recent survey by Gartner indicated that many corporations were, as a result of recent budget pressures, delaying upgrades in new operating systems and extending the life of desktops from 3 years to over 4 years. It is anticipated that such budget pressures will continue, with the operating system and packaged application upgrades being delayed 12 months or more, and the useful PC lifecycle extending to 5 years. This is bad news for solution providers, many of whom rely on upgrades to meet revenue and profit forecasts.

For IT budgets, although three-year life cycles were probably too aggressive, extending life cycles to five years or more can cause many hidden issues. If the assets require upgrades such as adding memory or storage, these upgrades require labor for desk side visits, installations and test. These upgrades can be 2-3 times more expensive than the cost of the upgrade itself, and negate any savings from extending the useful life. And there are substantial hidden downtime and service costs that must be factored as reliability declines.

Savvy solution providers will need to develop selling methodologies, which communicate the issues with extended lifecycles and help to justify replacements.

Consolidation

Projects without a quick payback are off the table, and IT money is increasingly being spent on activities that re-engineer business processes with an eye toward cost savings. IT managers are reacting to these budget pressures in various ways, from consolidating systems to renegotiating contracts to postponing technology upgrades. – Gary H. Anthes , *ComputerWorld*

The second major cost cutting measure being implemented is to consolidate operations to reduce costs and regain control. The fast growth in investments over the prior five years led to wanton spending with few standards and little economies of scale. Everyone was in too much of a hurry. Many organizations now have hundreds of servers distributed throughout business departments in many locations. Where once the organization had two-dozen applications, it now has hundreds to support. Standards for these applications, PCs and servers are lacking. In a need to deploy applications and resources quickly, many times business units took charge procurement and deployment. Now with cost cutting as a top priority, distributed budgets and the proliferation of non-standardized distributed assets must end. In a backlash against these ills, CIOs are seeking to regain control – retaking budget responsibility, and consolidating assets from distributed department deployments back to the data center.

For solution providers, the opportunity exists to convey the benefits of consolidation. With consolidation, management and support resources can often be reduced – through configuration standardization, implementation of consistent best practices and physical consolidation. With the resources better configured and closer to management and support resources – availability is also improved. One of the most popular is consolidating distributed department servers and storage into more capable and reliable enterprise operations centers. The migration to enterprise class servers and storage area networks can achieve savings of 20% or more in resources and costs – but does require an investment up-front, something that not every company can afford under extreme budget pressure.

Services

"Interest in IT outsourcing historically accompanies economic lean times. So it's not surprising that the belt-tightening occurring in many companies in the face of an economic slowdown is generating renewed interest in the strategy." - Jon William Toigo, *NetworkComputing*

Many solution providers are seeking to make it easier for CIOs to implement cost saving measures – through services. As we have indicated, the greatest "fixed" cost is not the hardware, software and service contracts, but the staff expenses for resources needed to develop applications, manage and support these assets.

Because of the high fixed cost of management and support costs of the existing infrastructure, little is left over for improving management practices to help improve the efficiency of current resources, and even less is available for innovation. An analysis of IT budgets indicates that a dismal 10% of typical budgets is allocated to new applications and innovations.

The larger the existing infrastructure, the more demand is being placed on the infrastructure resources and budget to manage and support the infrastructure, and the less is available to new programs. According to Gartner's research, the typical help desk five years ago supported 20 to 25 applications, whereas today this number has ballooned to an average of 200 applications. Growth in hardware devices has increased in the range of 300 percent or more over the same five-year period. The staffing, training and tools of the PC support staff have not similarly increased to keep pace – only 30-40% over the same period according to our research – leading to low customer satisfaction

and availability issues. With such increasing demands, and with management and support budgets not growing to keep pace with the infrastructure itself, it is amazing that even 10% is being found to support innovation.

In an ideal world, most CIOs would rather spend 65% of their efforts on improving the company's competitive and strategic initiatives through new programs rather than on operations management and support. The reality is that each asset, application and software package has placed a large, unpredictable burden on the IT staff, and has quietly managed to consume most of the IT budget.

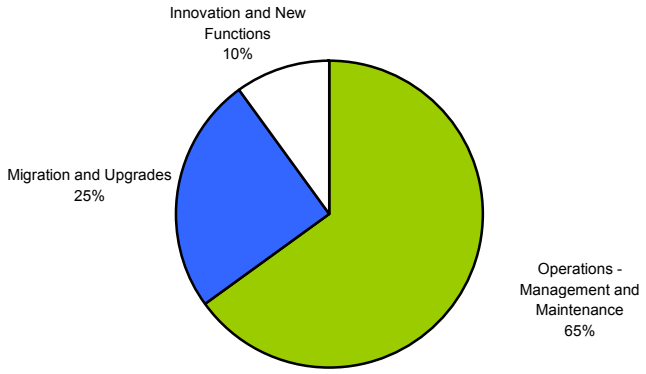

Figure 15 : As many CIOs can attest to, the demands of day to day management and support make it difficult to deliver innovative new programs and functions. As a result of the 65% expended on basic operations maintenance and support, and another 25% dedicated to migrating and upgrading the existing infrastructure and applications – only 10% is left over for strategic innovations.

Besides the high fixed expense, and lack of budget for innovation, IT projects as a whole remain risky. In a year 2000 survey on IT projects by the Standish Group, only 28% of IT projects – a dismal 1 in 4 – could be considered a success, completing on time, within budget and meeting expected features and functionality. The number of successful projects exceeded the number of projects which were canceled by only 5%. Today, internal resources are bearing the brunt of the IT risk. A prudent CIO not only recognizes the large dedication of internal resources, but that there is a huge risk in the application of these resources. With budget constraints, the tolerance for cost overruns and schedule slips has declined – resulting in a trend where even more IT projects will be cancelled or postponed – increasing the risk.

High fixed expenses, the lack of innovation funding, and IT project risk combine to drive companies to seek more aggressive outsourcing programs to help reduce budgets, improve capabilities and service levels and to pass the risks on to the solution providers.

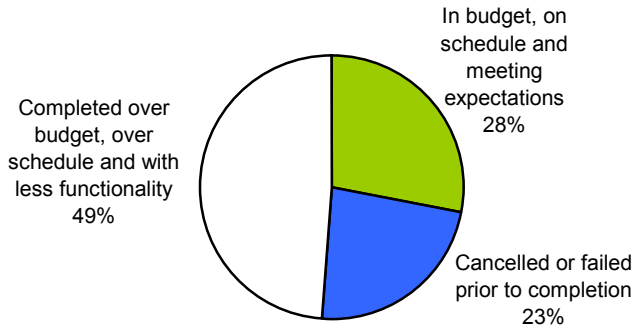

Figure 16 : Standish Group, Year 2000 survey results for 2000 projects

With over $1 trillion spent by US companies on internal resources in the US alone, outsourcing of these services represents the largest opportunity ever presented to IT solution providers. And many solution providers will admit that the timing couldn't be better. In tight economic times, companies seek to delay hardware and software upgrades. IT solution providers are running out of revenue and profit opportunities and they need to capture this opportunity to succeed in the next boom cycle – and for many, services are the answer.

However, IT executives view today's outsourced services as being costly – after all, comparing contract costs for typical professional services programs, they can often hire two resources for the one professional resource that they outsource. For many of the hardware vendors, they have been selling these services the same way for the past 20 years - as build verses buy, as opposed to high availability and redeployment of resources to more strategic programs. The solution providers fail to communicate how their highly trained resources, with best practices, proper tools and back-office support can outperform a team of full time staff members – and how the service level guarantees deliver millions of dollars in availability improvements. These properly deployed outsourced resources make it easier to scale more effectively, set and predict costs, and allow the corporation to focus on their core business.

Once contracted, these same solution providers have also been doing a poor job of communicating the total value of the investment. Each year the vendor reports on all of the tasks that were accomplished – never once mentioning the quantified financial returns from the projects and services, and extending the view even further – the resultant gain in revenue or shareholder value from the investment. As a result, when budgets are scrutinized, the solution providers make it too easy for the CIOs to cut back on their contracts – after all, as the argument goes, our own resources can do the same tasks for less money.

Software vendors moving to more of an ASP model and in the future component-based services such as Dot Net will face many of the same issues. If the software is sold the same way - as a build verses buy decision - then the solutions may seem more expensive than today's packaged solutions. The successful new-age software vendor will need to sell their solutions as highly available, secure and accountable solutions. Availability means that unplanned downtime will be eliminated, planned downtime will be reduced, and that when an issue occurs, the vendor will take full responsibility. Security means that the vendor – not the corporation – will assure that the corporate assets are safe and secure from both internal and external threats. Accountability means that interoperability, scalability and financial returns will be understood and economic performance measured. The initial ASP business models came under intense scrutiny, and many of the vendor's recent forays into component based network services, will as well, until programs are launched that provide these three key factors for success.

Therefore, although the opportunity is extremely large, in the near term services will face even more scrutiny than hardware and software asset purchases – until service vendors change their strategy to address the three key outsourcing issues: and availability, security and accountability.

Vendor	5 year revenue growth – annual %	5 year profit growth – annual %
Microsoft	33.5	46.7
Oracle	27.8	70.2
SUN	20.1	39.4
HP	11.1	16.9
IBM	6.4	20.6

Figure 17: Can the top IT vendors sustain their growth? Figures from 1996 to 2000.

Network Services: The Next Big Thing

"…the trend we're talking about is not for the next two or three years. It's for the next two or three decades. It is a major shift in computing. So, we are entering a new era of computing. We're at the beginning of this new game, not the end." - Carly Fiorina's response to an InformationWeek question about the new generation of HP's E-Services

With an immediate need to reduce fixed costs, find more budget for innovation (even as less funds are available), and reduce risk, corporations will stop building, managing and supporting their own unique hardware and software solutions. Instead, IT executives are seeking to turn their IT investments into computing utilities – a set of network services that can be purchased on a demand basis, much like a telephone service. As such, IT budgets will migrate from project based overhead expenses to a direct cost of operations.

As upgrade cycles are extended, solution providers are realizing that they must change in order to maintain revenue and profit growth. Early entrant Application Service Providers launched in 1998 pioneered the business case for renting key applications – although such initiatives were met with early skepticism, especially during the boom times when motivation was low to move to a risky new business model on the hopes of saving a buck or two. Tier one vendor programs including Microsoft's Dot Net, IBM's WebSphere, Sun's One Net and Oracle's Dynamic Services are taking these initiatives to the next level making software a scalable component-based pay per use utility. As an example, with Microsoft's Dot Net, instead of writing captive applications, you can rent components and data as needed. Through the standard components and XML data structures, guaranteed anywhere access and interoperability is delivered. Compaq's COD, and competitive offerings from Dell/EDS, HP, Storage Networks and IBM seek to do the same for infrastructure, making PCs, storage and messaging available turnkey with all technology, management and support for a fixed monthly fee. As the component based application services business grows, one can anticipate these two types of service offerings merging into a global service of hardware and software utilities for every imaginable purpose.

These new services will displace the current practice of purchasing networked assets and packaged software. Such outsourced utilities promise to implement superior best practice services, and improved service levels, without requiring large up-front capital investments. Technology refresh, upgrades and interoperability are delivered as a standard part of most programs. With the management and support burden placed on the vendor, Corporations are freed to not only save labor

expenses, but also scale more effectively and re-deploy the resources to more strategic programs.[14] With superior service level agreements and availability guarantees in writing – additional significant benefits can occur from increased service response levels and reduced downtime.

As a result of these utility programs, solution providers can increase their share of the IT budget over the next seven years– expanding from the meager 12% hardware and software spending today, to an estimated 40% share – the largest opportunity ever presented to IT solution providers[15]. As, the solution providers struggle with layoffs, extended sales cycles, and lowered revenue and profit estimates, it is difficult for many of the vendor's executives to think that the coming period represents such a unique and huge opportunity. When in the trough from the prior wave of irrational exuberance, one cannot typically see the opportunity of the new approaching wave. As with the prior PC boom, distributed computer boom and Internet boom, this next wave will represent a major change in positioning and selling for the solution provider – and an ever greater opportunity than the wave prior.

As one forecasts these trends forward to the next boom cycle, it would appear that the largest companies stand to gain the most, and that consolidation to only a few major players could occur. Huge service providers such as Microsoft, IBM, Oracle/Sun, Dell/EMC/EDS, HP/Compaq are likely to be the winners in the new Network Services landscape – leaving us with anywhere from two to four powerhouses in the coming decade[16]. The next boom requires an enormous investment to not only implement the services, but to implement effectively the required availability, security and accountability.

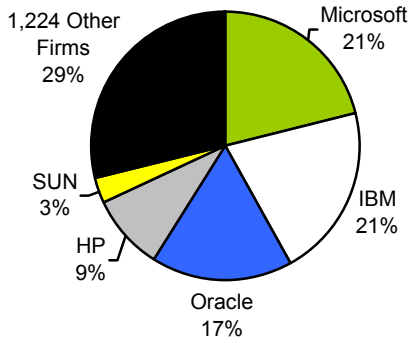

Figure 18: When comparing IT solution providers, most of the $37.3 billion of profit in 1999 was focused within three major leaders. It is expected that this trend will accelerate with the network services trend, consolidating even more profits in the hands of a select few solution providers.

At the same time, the network services trend will create a huge opportunity for start-up companies, able to help the major solution providers create and deliver the three key service elements: availability, security and accountability. Each of the network service frameworks will allow these startups to develop plug-in components for the new services. Initially, the major solution providers themselves will fund many of these companies in order to help gain credibility for their own network services platform as being the standard.[17] Later, these upstarts will fall by the wayside

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[14] Unfortunately, many of the resources will need to be cut as they will be ill-suited for reassignment to strategic management. Resources such as help desk and PC service technicians are at greatest risk.

[15] Although a large opportunity, it is often difficult for vendors to be profitable with services, price them correctly and still provide a positive value proposition.

[16] Already this is true as the majority of profits are isolated into the hands of the largest technology vendors.

[17] In fact, it is the recent failure of many corporate investments by these large vendors that may delay the start of the next cycle. Few of these companies are willing to place venture capital bets again until the climate improves, yet their new initiatives rely on start-up support to fill the gaps and provide utility and support for the services.

unless they deliver the three essential elements to services, or merge with the larger solution providers. And certainly, wireless will play a major role in the next wave delivering services anytime, anywhere.

Corporate IT departments face substantial change as well. The role of in-house IT staff will change from one of doing, to one of leading. In house staffs will be substantially reduced, with the majority of the labor costs transferred to service contracts. Although these services contracts seek to re-deploy existing staff to strategic programs, many of today's resources are technicians are ill equipped to manage outsourced vendors, lead projects, perform financial analysis and align IT to business. Those that are not reduced will have to be retrained in order to maintain their value to the organization.

Information Technology Leaders verses Managers

"If we say that leadership requires courage, we should recognize that courage is not required except in the presence of fear. If you are not scared, you are not leading" – Geoffrey Moore

When you ask traditional CIOs what they view as their key to success, many will tell you "running a tight ship". But recent research indicates that CIOs are focusing on the wrong criteria for success.

Contributors to Profitability	Percent Contribution
Competitive Advantage/Market Position	65%
Strategic Moves	10%
Operating Effectiveness	15%
Random Events - Luck	10%

Figure 19: Contributions to profitability as surveyed by the PIMS Program, a sample of over 3,000 businesses from over 300 corporations , from the Empirimetric Corporation

In a recent analysis of 3,000 business units from over 300 corporations, operating effectiveness – the ability to run a tight ship – contributed only slightly more than luck to a company's success. Overwhelmingly, success relied on the company's competitive advantage and market position. If profitability depends so much on competitive market position, then why do CIOs focus so much of their time on operational efficiency, rather than on the marketplace and competitive advantage that can be delivered by the technology?

Two issues have driven the focus on operations as opposed to market and competitive advantage:

1. CIOs are under whelmed with a budget that leaves no room for innovation and overwhelmed by the management and support tasks of the installed base
2. CIOs have been promoted because they are good managers of the technology, rather than because of their business leadership skills.

CIOs seek operational efficiency, doing what is immediately necessary to execute better than competitors, deliver higher quality, and make the organization more productive. A CIO that is a good manager is indeed an asset to the company. When looking at the lack of correlation between IT spending and business success, many issues can be correlated with a lack of efficiency and over-spending on IT. However, too much of the focus has been on the denominator of the IT value equation – the costs – and not enough attention is placed on the benefits.

Favorable	Strategic Influence	Unfavorable
Differentiated	Product or Service	Commodity
Segmented	Served Market	Unsegmented
High	Relative Market Share	Low
High	Relative Product Quality	Low
Low	Relative Costs	High
Good	Operating Effectiveness	Poor
Low	Investment Intensity	High
Substantial	Perceived Quality	Thin
Growing	Value Added	Shrinking
Positive	Growth Rate	Flat or Negative
High	SG&A and R&D	Low
New	Age of Assets	Old

Figure 20 : Paul Strassmann, in a presentation to the Information Age Collaborative Commerce Conference – October 2001, lists the many areas which a CIO can influence, and some typical measure of success factors across each leadership initiative.

Who in the organization is driving the technology initiative for marketplace and competitive advantage? Who is focused not only on the costs, but also on the benefits? Typically the benefit management comes from the business units, with very little involvement and coordination from IT. – And hence leading to problems in IT delivering what the business unit wants, or a lack of innovation in new technology which could have been effectively applied to better solve a business problem. However, to end the computer paradox and derive measurable profit gains from IT spending, CIOs need to become business leaders, as opposed to just technology managers. Leaders help the company attain sustainable competitive advantage, deliver better value to customers, pick market segment in which they can win, and manage risks.

All well and good, but CIOs have little time and resourced to delve into business innovation, and in many cases are not business leaders, but operational managers. However, in order to improve the value of IT, the next generation CIO needs to solve both cost and benefit issues in order to succeed. As a result, corporations should seek vendor partners who can deliver services such that budget and resources can be freed for innovation. Next, corporations should seek to install business oriented IT leaders to supplement or in some cases replace the operationally oriented CIO. Usually, the best leadership comes from a combination of resources, which often cannot be found in the same person – leadership and management. Therefore, when the unique combination cannot be found in a single person, the corporation should install two leaders – one operational and technology focused – the CTO, and the other focused on information economics – the CIO.

The Solution Providers' Plan for Success

"The deepest and most influential level of competitive advantage comes from catching the technology wave. Miss the wave, and there is no recovery. Catch it just right and it will catapult you to extraordinary heights." – Geoffrey Moore

Solution Providers are faced with a challenging landscape, as was true at the end of each of the prior boom cycles. Budgets have been reduced, and some key studies have been authored questioning the

value of prior IT investments and management. The winning solution providers will be those that learn to navigate through the current backlash, and position themselves for the next wave.

Three key success factors are recommended to succeed over the next seven years. The successful IT vendor will need to deliver:

1. Availability – Reducing costly downtime and assuring that losses do not occur and are insured
2. Security – Recognizing that much of a company's value is not in its hard assets, but in its intellectual capital, and mitigating the threats from internal and external security breaches – securing the wealth of the corporate assets from risk
3. Accountability - Delivering real value and competitive advantage to their clients, and proving it on a micro and macroeconomic basis not only during the sales process, but on an on-going basis

The next generation vendor will need all three of these in concert to lead the next boom.

Availability

"Technical expertise, responsiveness, quality and effectiveness, and availability are the most important mission-critical service attributes used to evaluate and select an external service provider. Solution providers need to put a priority on marketing their capabilities in these areas while ensuring their service delivery is measured and maintains high standards". - Eric Rocco and Bob Igou, Gartner DataQuest

Many organizations are exclusively built on a platform of technology, relying 100% on availability to operate and deliver goods to market. Companies such as Yahoo, Amazon and eBay are completely built on technology, while other more traditional businesses have become more reliant on technology for daily operations and competitive advantage. As such, much more attention is being placed on the cost of downtime and assuring availability.

Unplanned Downtime (Mission Critical)	Typical Uptime	Hours Down per Year	Cost per Unplanned Downtime Hour	Downtime Risk
Average	98.000%	174.72	$ 42,000	$ 7,338,240
Very Good	99.000%	87.36	$ 42,000	$ 3,669,120
Outstanding	99.500%	43.68	$ 42,000	$ 1,834,560
Best in Class	99.900%	8.736	$ 42,000	$ 366,912

Figure 21: Typical downtime risks for various availability levels. Note that a 1% increase in availability translates to over $3 million in value.

Solution providers need to understand that even though corporations are focused on cost cutting measures, budgets cannot be cut such that they will result in increased downtime. Solution providers who understand the downtime equation will be able to not only stave off budget cuts, but also increase budget share – because the availability equation is so compelling. An average company typically has 98% availability – meaning that due to unplanned failures, the computing resources are unavailable 174 hours each year. Using a conservative mission-critical application average of $42,000 per downtime hour according to Gartner, over $7 million is lost each year due to unplanned downtime in the average environment. If a vendor could help the average company step up to just average downtime, some $4 million could be saved annually. And for companies who rely 100% on technology such as on-line brokers, trading platforms and e-commerce, hourly downtime risks can be $1 million or more, making availability an even greater issue.

With each increase in availability, an increasing non-linear investment in planning, technology, training, management and support resources will be required. As an example, the investments are estimated to be 2.5 times more expensive to move from Very Good to Outstanding, and five times more expensive to move to Best in Class.

Outage Cost per Minute	
Supply Chain Management	$ 11,000
Electronic Commerce	$ 10,000
Customer Service Center	$ 3,700
ATM/POS/EFT	$ 3,500
Messaging	$ 1,000

Figure 22: According to the Standish Group, outage costs per minute can be extreme, particularly for mission critical applications such as supply chain management and electronic commerce.

Using a combination of mission critical systems, integrated applications, best practice management and global support services, solution providers can outsource much of the availability burden and deliver high availability capabilities that are cost-prohibitive to most organizations. Solution providers, by sharing the availability investment across companies can deliver high availability for a fixed monthly cost that is less prohibitive. Of course, solution providers will need to be able to deliver and prove high availability as a key tenant to any service, and with guaranteed delivery. Remedies for failure to deliver may be as extreme as re-imbursement of lost revenue.

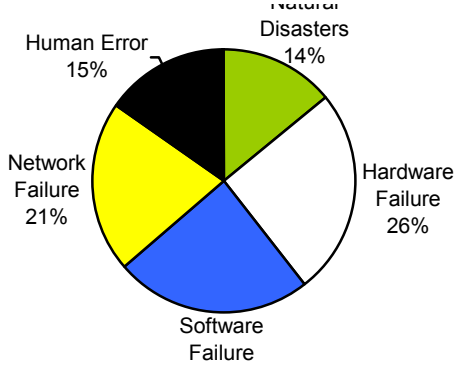

Figure 23: Unplanned downtime has many causes, requiring a focus on all aspects of the computing environment, mitigation of risks from natural disasters, as well as processes, procedures and training to mitigate against human error. Because of the distributed nature of such issues, achieving higher availability becomes cost prohibitive for most IT budgets.

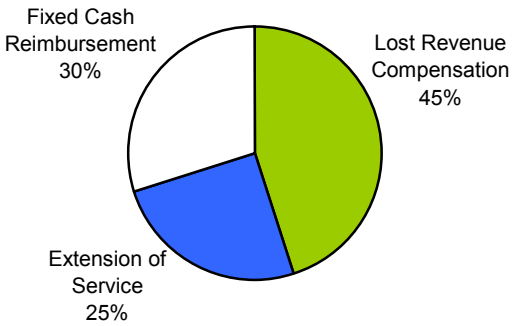

Figure 24: If a vendor fails to deliver on service level guarantees, the majority would like to receive lost revenue compensation and a fixed cash reimbursement.

Security

"IT executives will be more in tune with costs and business benefits, and will be even more skeptical of new, high-cost technologies. And the threats of internal security failure or external disaster will be taken with an unprecedented seriousness." - IT Does the 'Math' In Terrorism Aftermath, Tim Wilson Internet Week, October 5, 2001

"This move towards services and outsourcing is raising issues of security. The problem is that the solution providers are creating major single points of failure. When an information warfare attack comes, it will be against all the vendor's customers, not just one company. This makes security and information warfare the dominant issue in the future development of IT." – Paul Strassmann

"Although e-mail viruses and international espionage steal the media limelight, security spans every business process, application and desktop" – Security TCO Model Helps With More Than Cost Savings, Gartner analysts Roberta Witty and William Malik

With recent tragedies such as September 11th, even more emphasis has been placed on security. Can information technology providers deliver outsourced services and maintain the required security and information integrity needed? This perhaps is the single greatest concern in outsourcing plans, as it should be.

Security threats have been increasing and making headlines in record numbers. The cost of virus attacks alone on information systems around the world reached over $10 billion in 2001, according to Computer Economics of Carlsbad, California. The recent flurry of headlines points to both an increase in the frequency and impact from such threats. This increased awareness has caused companies to implement measures to deal with security threats and has prodded the legislature to begin addressing issues such as online privacy, electronic theft and Internet security.

The 2000 Computer Security Institute's survey reported that 85% of the participating companies detected security breaches within the last 12 months and 64% of the companies acknowledged financial losses due to these breaches. As might be expected, the Internet and e-mail were the primary source of attack with over 80% of the respondents experiencing a virus/Trojan/worm attack and 70% indicating that their Internet connection was a frequent point of attack. As expected, these high profile external threats have been addressed by most companies with over 76% implementing policies and systems such as access passwords, firewalls, virtual private networks, intrusion auditing systems, SSL encryption and anti-virus software. Even with these point solutions, security incidents occurred and attacks succeeded.

Types of External Breaches
Viruses/Trojans/Worms
Denial of service
Exploits related to active program scripting/mobile code
Attacks on protocol weaknesses
Attacks on insecure passwords
Buffer overflows
Attacks on bugs in Web servers

Figure 25: External breaches garner much of the headlines and security budgets

Recent terror attacks certainly highlight the potential for violence unleashed on innocent civilians and businesses, but perhaps the most serious threat is the implication one can make regarding the profile of these new suspects –college educated terrorists. Should the violence move to cyber-

terrorism, not too hard to imagine as many of the terrorists were university trained engineering students, these external threats will become far more sophisticated than today's nuisance attacks – seeking to destroy entire markets or select companies – attacking the world's largest brand names not with suicide bombers but with traffic bombs, information theft and data destruction.

Even more damaging than external breaches, but less known, is the threat from internal security violations. Industry analysts have estimated for a long time that more than 80 percent of data theft and damage occurs from within the organization not from external threats. "Besides having access to the corporate network, insiders are more knowledgeable about the company's information resources, states Dorothy Denning of Georgetown University and author of *Information Warfare and Security*. "That makes it easier to plan and carry out an attack."

Think the internal security threat isn't real? Ask the executives and IS professionals at the following companies about the impact of internal breaches:

- On October 25, 2000 Microsoft acknowledged an attack on the company's corporate jewels with unlimited ramifications. A hacker penetrated Microsoft's corporate network for as many as 12 days, accessing and possibly stealing important operating system and office source code. – Indications are that the attack may have originated from a Microsoft employee's or contract worker's home PC. The attack installed malicious software that allowed the hacker to log in remotely to Microsoft's network.
- At Omega Engineering's Bridgeport NJ manufacturing plant, a former network administrator planted a software time bomb that systematically erased all of the programs and data that ran the company's manufacturing operations. With the only backup tape also missing, the plant was no longer able to manufacture. This caused $12 million in damages, and permanently effected Omega's competitive and strategic positioning.
- At Purity Wholesale Grocers, a $1.5 billion national grocery outlet based in Boca Raton, Florida, a hardware engineer who worked in the IS department downloaded a virus intentionally and crashed the computer network for two days.
- A consultant with Steinberg Diagnostic Medical Imaging in Las Vegas was recently charged with three counts of network intrusion for changing passwords in the network, which, in an act of revenge, locked administrators out of their own system, causing serious administrative support and downtime.

The impact of such internal breaches is hard to quantify. Many of the issues go unreported. Others are an embarrassment to the corporation leading to possible litigation when privacy is breached. New laws have been approved which make destruction and theft of data a federal offense.[18] New privacy policies outlined in the Health Insurance Portability and Accountability Act (HIPAA) and Gramm-Leach-Blily bills mandate that companies ensure the privacy and confidentiality of personal medical and financial information from internal and external threats.

Insider Breaches
Accidental – 48%
Deliberate – 17%
Unsure – 35%

Figure 26: Source - Information Security, September 2000

As current economic conditions continue, internal security risks are expected to increase. Why? Because more layoffs and disgruntled workers mean a greater possibility of internal security breaches, leading to greater potential impact on organizations. Just as external threats are being

[18] To qualify as a federal offense, computer sabotage needs to affect a computer used in interstate commerce and cause more than $5,000 worth of damage to the company over a 12-month span.

addressed through security policies and systems, attention should now be directed internally to thwart internal security risks. As well, service providers need to assure their clients that they have not only protected them against external threats, but have secured operations and data against internal issues.

Internal Security Breach	Typical number of occurrences annually per 1000 users	Typical impact per occurrence	% of companies reporting that a breach occurred in past 12 months
Corruption of Information (intentional)	Once	220 users affected for 4 hours $25,000 lost productivity	35%
System and Data corruption (accidental)	9,600 issues, with 1,200 requiring dispatched support and causing downtime issues	$250,000 in support costs; $70,000 in downtime productivity losses	80%
Accidental Disclosure of Information	15 due to unattended computers being left on and logged in, and an additional 8 disclosures due to external security breaches.	$25,000 per occurrence in fines or business losses	40%
Physical Theft	1 in 4 former employees illegally acquire ill tracked assets upon their departure	Average of $75 per ex-employee	42%
Electronic Theft	Once	$100,000 per occurrence in business losses	24%
Illegal activities and fraud	Once	$50,000 per occurrence in business losses, fines and legal fees	63%
Software license violations	0.33	$250,000 average fine when issued.	75%

Figure 27: Internal security issues can be costly to an organization, and are harder to mitigate. According to the Information Security Survey, September 2000 , The number of companies with insiders who stole, sabotaged, or intentionally disclosed proprietary data increased by 41% over last year, while those reporting physical theft of equipment by insiders nearly doubled. This not only covers company employees, but operations center resources who will have access to the corporate jewels of many major corporations.

Regardless of the source of the threat, external or internal, the vendor as service provider must meet the security issue head-on. As more of a company's assets that drive market value become information based, security becomes a more vital issue.

Security is a hurdle whereby the prospect must trust that the service delivers higher security than what is available by performing the service with internal resources. Security can be a differentiating selling point, one in which the threats are quantified, and the cost of achieving a secure environment illustrated as an alternative to the more cost effective outsourced services.

Accountability

"If the solution providers can't guarantee protection against a wide range of risks, you may want to wait before handing over the keys to a source you can't trust." – Paul Strassmann

Over the next decade solution providers must recognize that the value of IT will no longer be taken for granted. That the spending, as if in an arms race, has ended. Solution providers will need to understand the organization's economics, and prove that the investments in technology are having a positive impact. On a macro-economic level, the largest solution providers will need to help CIOs understand their current competitive position with regard to IT spending and profit performance, and how to improve the performance through innovative programs and more effective management.

On a project-by-project basis, a more micro-economic view, solution providers will need to prove the Return on Investment (ROI) from new projects, tools and management initiatives – not only

during the sales process, but also throughout the project's lifecycle. ROI will include not only the costs and quantifiable benefits, but also a broader view of how the project will impact and influence the corporation. When the ROI of a single project is understood it must be compared and contrasted with the ROI from current investments and proposed projects – such that the entire investment portfolio can be managed effectively.

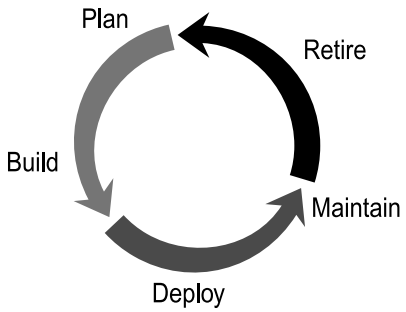

Figure 28: Often financial analysis is performed only during the initial phases of a project. It is important that return on investment analysis be extended to be not just a planning tool, but a lifecycle management tool, and that it include all costs and benefits over time.

The remainder of this work will be dedicated to helping solution providers understand and apply ROI as a sales and management tool - a means to become accountable and deliver on one of the three requirements for success in the next wave.

Section II – Return on Investment for IT

"You can make enormous amounts of money out of computers if you know what you are doing and if you are looking for payoff, rather than glory." – Paul Strassmann

ROI is Now a Requirement

As we have illustrated, the new climate is now one of fiscal restraint, and in a quick reversal, the spendthrifts are carefully scrutinizing most expenditures. IT budgets are being reduced, and high profile reports have corporate executives wondering where the value was in all their IT investments. Vendor sales cycles have returned to more normal durations, from less than four months during the height of the euphoria, to more than a fifteen-month cycle for large purchases. Only those solutions that clearly demonstrate a Return on Investment (ROI) are being considered. Accountability reigns, and corporations are looking for those solution providers that can prove their worth

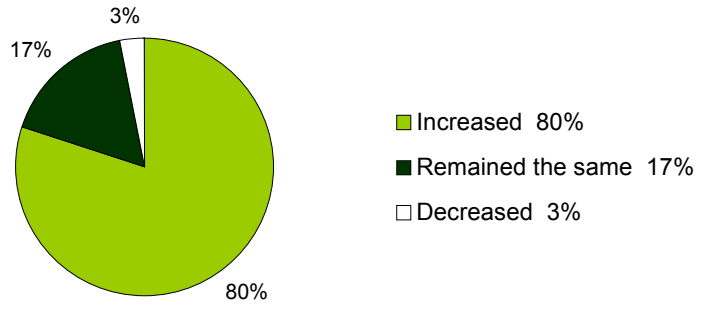

Figure 29: How has the importance of measuring the ROI of technology investments changed from a year ago? Data: InformationWeek Research Return on Investment Study of 200 IT and Business Professionals, summer 2001

With tighter budgets, IT solution providers and IS executives are being put to task to demonstrate how IT investments will deliver real, quantifiable value. As John Chambers, the CEO of Cisco stated in an interview with Computer Reseller News, "There is now a focus on customer profitability that I have not seen in my business career. Today, if you tell a customer CEO that he's going to have to spend $20 million to build out his network infrastructure, his eyes will glaze over.

But if you tell the customer he can expect to save $50 million on his investment and give him a time frame for when he can realize the savings, CEOs will spend the money once they understand." Chambers highlights a crucial point that is often lost in the "booms": IT purchasing decisions need to make economic sense!

During the last wave of IT growth and investment, overabundance of capital forced CIO's to make uninformed decisions out of necessity for infrastructure. In early 2000, the decision as to whether to install a business' network infrastructure was simply deciding which vendor to select rather than whether it made fiscal sense. Now in leaner times large purchasing decisions can be put off and need to provide quantifiable returns before a commitment is made. This is readily evidenced by statements from Continental Airlines CIO Janet Wejman in an interview with *ComputerWorld*, where she states: "Our CFO has reviewed and approved IT and e-business projects based on our projected return on investment. So if we can show profitable returns on something, the company will go ahead with it regardless of the economy."[19]

In the subsequent sections, we will explore the application of ROI analysis to the selling of IT solutions, establishing the detailed models, methodologies and tools for applying ROI to help reduce vendor sales cycles, increase selling efficiency and delivering competitive advantage. As project selection and management improves with the application of ROI, the vendor can be accountable for helping the corporation obtain more value from IT.

What is ROI Analysis?

"Every CIO knows they're under tight budget constraints. We measure ROI on everything, and that ROI calculation has to pass the toughest of all tests, the CFO test." - Bob Napier, Compaq's CIO.

To evaluate whether a project or portfolio of solutions will provide a worthwhile return to an organization, project planners and financial analysts are once again returning to ROI analysis as a means of quantifying the potential gains from proposed solutions. In general terms, the ROI analysis compares a project's costs to it's benefits. Purchasing decisions come down to a micro-economic financial analysis; if the benefits outweigh the overall costs, and the returns are substantial and delivered in a reasonable time frame, the project can be seen as a positive financial business case. From the project to the portfolio, ROI analysis can be used to compare the returns from all proposed solutions to select only the best. And from project selection to project management, ROI analysis can be used to assure that the individual project and portfolio of solutions is delivering as planned throughout the lifecycle.

ROI analysis can be used to improve the discipline of IT investments, helping to assure that they are well researched, align themselves with corporate business goals, are objectively selected, and yield a measurable and demonstrable value to the organization.

Case Study: Traditional ROI Defined

Traditional ROI Analysis is a set of calculations by which costs and benefits are researched, calculated and compared, to determine if a project is a worthwhile pursuit. In its most simple form:

ROI = Net Benefits / Costs.

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[19] These quotes from Continental Airlines preceded the tragic events of September 11th. Such external threats to planned expenditures and investments are difficult to plan for. It is likely that when such events hit, even projects that promise viable returns are questionable, as the up-front cash is often unavailable to reap the longer-term rewards.

In this equation, costs typically include capital expenses, planning and deployment, application development and on-going management and support. Benefits typically include labor savings, operational savings, productivity benefits and profit gains. Net benefits equals benefits minus costs.

The ROI Analysis uses several financial metrics to judge the viability of a given project. These include a calculation of the ROI itself, Net Present Value (NPV) savings, Internal Rate of Return (IRR) and Payback Period (breakeven point).

ROI is used to calculate the value of a change – comparing the cost of change to its benefits. The benefits are calculated from comparing the company's costs, productivity and revenue before project to after project.

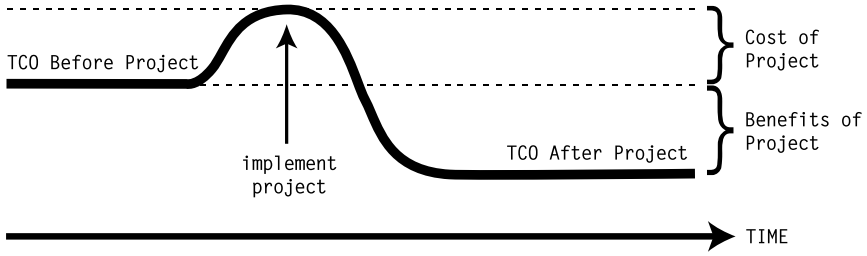

Figure 30: ROI represents a measure of the cost of change and benefits between current state and predicted future state. Shown here is a typical Before/After timeline of a cost-reducing infrastructure project

Project Costs

"Did you hear the news? It came with a shout on Sept. 11 and a quiet sigh as the economy eroded further. Times have changed. Growth is out; efficiency is in. If you want to prevail in the new economy, forget about that fancy e-commerce initiative that may or may not pay off down the road. Business once again wants IT to focus on reducing costs and doing more with fewer resources. And with the nation at war and the economy in a true tailspin, it wants to see payback on these investments immediately." – Steve Ufelder, ComputerWorld

The first step in a traditional ROI analysis is to tally all project expenditures, creating a structure to collect and evaluate costs, making sure that no elements are overlooked. Costs can include capital expenditures such as software, hardware, development tools, network systems, training courses, travel, support contracts and facilities costs, as well as labor expenses for planning, evaluation, testing, application development, deployment and ongoing support and management. Working with the vendor or consultant, as well as purchasing and finance personnel, the IT professional can determine all requirements for the project and provide good faith estimates for capital and labor costs.

As total cost of ownership (TCO) studies since the early eighties have indicated, the capital expenditures on IT investments comprise less than 20% of the total costs of owning the computer asset.[20] As such, it is important to have a discipline in place to capture the initial planning, deployment and on-going management and support costs from the project, to avoid costly surprises. More projects fail to deliver expected returns because of hidden costs, than for any other factor.[21]

[20] See section on TCO vs. ROI for additional information on the TCO model and metrics.

[21] A close second is the lack of expected user adoption to the features required to yield benefits

Project Benefits

"Now ROI is in style again as budgets tighten and investors reward frugality." - David Joachim, senior managing editor of InternetWeek

Similarly, the ROI analysis creates a framework for understanding and quantifying the potential benefits that a project can deliver. Many IT professionals believe that it is too difficult to quantify potential benefits, and therefore avoid using ROI. By decomposing the potential benefits into four main categories, it becomes easier to uncover potential gains, and begin the quantification process. The four categories that are proposed for making analysis of the benefits easier are:

- **Labor Savings** – the savings due to expected headcount reduction from implementing the planned project.[22]
- **Capital Expense Reductions** – the savings in capital expenses such as raw materials costs, office supplies, printing costs, power or facilities expenses from implementing the planned project.
- **Productivity Benefits** – the gains in user productivity from implementing a solution, including reductions in system downtime (loss avoidance) or efficiency gains in performing specific user tasks.[23]
- **Business Benefit –** the gains in profit resulting from increased revenue. These gains can be driven by increased sales, increased profit margin, more effective customer acquisition and conversion percentages, and increased customer retention.

"There's no shortage of business and technical details to measure when determining technology's value to the business. The trick is picking the right things to quantify" - Johanna Ambrosio, ComputerWorld

By using these four categories, most of the project's benefits can be categorized and quantified using standard formulas.

Net Tangible Benefits: Comparing Costs and Benefits

"Less than half of IT managers report a positive return on their IT spending, according to a survey of IT executives at 200 businesses in October and November, sponsored by Unisys Corp. The survey says about 44% report a positive return on IT investments, 42% report a level return, and 14% a negative return." - Diane Rezendes Khirallah, Information Week

When the costs and benefits of the project are quantified, they can be compared to determine whether the project yields a quantifiable financial benefit. The comparison of quantifiable costs and benefits results in Net Tangible Benefits.

Unfortunately, there is no single net tangible benefit metric that can be used to effectively assess project viability, so the costs and benefits are compared using a number of financial measures. These primarily include:

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[22] Reduced labor needs in one area may result in re-allocation of extra capacity to other areas of need, or be offset against reduced hiring in the future as business grows.

[23] Often, productivity benefits are discounted, to account for the fact that not all of the savings in work time will yield a gain in productive work time. Users may use the timesavings to reduce some of their unpaid overtime, chat with co-workers or spend time on non-work related activities such as surfing of the Internet.

- **ROI calculation** – a ratio of the net gain of a project compared to the total project's cost
- **Net Present Value (NPV) savings** – the net difference between the costs and benefits of a project in today's dollar terms. Costs and benefits in the future are discounted to account for the time value of money[24]
- **Internal Rate of Return (IRR)** – in conceptual terms, the equivalent return an investment would have to yield to compare to the cash flow of the proposed project
- **Payback period (breakeven point)** – the period in time at which the project achieves breakeven, where, in a cash flow timeline, the cumulative benefits exceed the cumulative costs.

This is where the ROI analysis often becomes very intimidating, as the comparisons often use complex formulas in order to calculate the expected return, or take into account the "time value of money". Fortunately, there are spreadsheet and interactive tools to help crunch the numbers and automate the calculations.

Many question why four different calculations are needed to tally the returns for a proposed solution. Each calculation serves to highlight an important aspect of the cost/benefit ratio and the projected cash flows with the investment. For example the payback period is a great metric for determining how quickly a project will become cash flow positive, which is very important for companies without much available cash. But the payback period does not indicate how much the investment will yield in returns or whether the returns are high enough to outweigh the risks. Each of these investment decision metrics has a strong suit and an Achilles heal; but when combined, they are vital in determining viability and measuring success.

Traditional ROI analysis can be used to assess the validity of a specific project; such as if the projected benefits outweigh the costs. The traditional ROI analysis forms the financial business case, quantifying the costs, tangible benefits and financial returns of the proposed project. The results of an ROI analysis ultimately gives the vendor an opportunity to quantify the costs, benefit and returns from the planned project, in return making project and vendor selection easier, and sales cycles shorter. For the corporation, ROI analysis delivers the education, confidence, documentation and authority to make an objective purchasing decision.

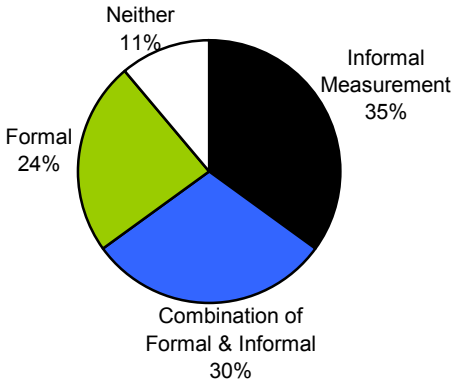


Figure 31: Does your company have a formal ROI measurement system or informal payback scenarios? - Information Week Research ROI Study of 200 IT and Business Professionals.

[24] Money has time value, defined by interest rates and inflation, which act on the money over time. Costs and savings in the future are worth less in today's dollars, because a dollar today has more buying power than a dollar in the future. Under normal conditions, $100 invested today yields $104 in one year (assuming a 4% simple annual interest rate), but depending on inflation, that $104 might not buy the quantity of goods or services next year that $100 would buy today.

Return on Investment (ROI) Defined

ROI Defined: A general concept referring to Earnings from the Investment of Capital, where the earnings are expressed as a proportion of the outlay.[25]

As we have documented, knowing the value of ROI is important when making an IT investment because it clearly demonstrates the financial gains of the proposed project, compared to the relative cost. The Return on Investment (ROI) calculation itself is fairly straightforward. In its simplest terms, ROI is the ratio of the net gain from a proposed project, divided by its total costs. In a formula, this is represented as:

ROI = cumulative net benefit / total costs

When calculated, ROI is represented as a percentage demonstrating the value of the investment and so in formula's ROI% will represent this value. For example, if a project has an ROI% of 200%, the expected net benefits of the project are double those of the expected costs for implementing the project. In more basic terms, every $1 invested in the project will yield $2 in net returns.

The ROI calculation typically uses the total investment costs over the analysis period, and considers all savings and other benefits. The cash flows from such a project may look as follows:

	Initial	Year 1	Year 2	Year 3	Cumulative Total
Total Costs	$ 100,000	$ 25,000	$ 25,000	$ 25,000	$ 175,000
Total Benefits	$ ---	$ 200,000	$ 200,000	$ 200,000	$ 600,000
Net Benefits	$ (100,000)	$ 175,000	$ 175,000	$ 175,000	$ 425,000

ROI% $425,000 / $175,000 = 243%

The ROI was calculated by taking the Cumulative Net Benefits of $425,000 divided by the Cumulative Total Costs of $175,000. Hence, the net benefits are more than double the investment, yielding an ROI% of 243%. Every $1 invested will yield a $2.43 in net returns.

The ROI calculation is valuable because it creates a ratio between the expected net benefits of a project, in relation to its costs. As a simple % of calculation it is easy to understand and explain the results. The ROI calculation will yield high percentage results when the net benefits outweigh the costs in relative terms, regardless of the magnitude of the costs or benefits.

The ROI calculation does have some shortcomings. First, the ROI formula shows the net return from investment but does not indicate the time to returns. Second, the ROI calculation does not take into account that in some cases the projects total cost and benefit value may be so small that the net benefits are not worth considering. As an example, the ROI% of a planned project might be significant 500%, but the net benefits of $10,000 on a $2,000 investment are so small that the project is not worth comparing to the millions of dollars in benefit that most corporations are seeking. In other cases, the costs may be so high, that even though the net benefit is high and the ROI yield is high, the project exceeds a reasonable investment risk. For example, a project with costs totaling $10 million and projected net benefits are $100M, would yielding ROI% of 1000%, but the risk of applying $10 million to a single project might be too high for a cash strapped company. The background economic scenario of each situation must be considered.

[25] The Dictionary of Modern Economics, 4th Edition, The MIT Press, Edited by David W. Pearce

Third, the simple ROI calculation typically does not use net present value terms in its calculations. Net present value calculations use the "time value of money", taking into account the fact that the purchasing power of a dollar in the future is not worth as much as it is today. Hence, if you invest a dollar today, you would expect to receive more than a dollar back in the future in order to make the investment worthwhile. The time value of money uses the discount rate, or cost of capital, to adjust the cost and benefit cash flows over time, into today's dollar terms. The discount rate is typically set to the interest rate at which the company can borrow money. As an example of the time value of money, to equal $1 invested today, with a discount rate of 7%, you would have to receive:

- $1.07 a year from now, equal to $1 + $1 * 7%
- $1.15 two years from now, equal to $1 + ($1 + $1* 7%) * 7%

The time value of money can be represented as an opportunity cost, i.e. how much you would have earned investing the dollar someplace else, or as a cost of capital, i.e. how much interest you would have had to pay if you borrowed a dollar.

Because IT analysis often occurs using three year periods, typically, the ROI calculations lack of using NPV calculations does not cause issues. However, if the discount rate is high, the calculation may not consider that savings in outgoing years are not as valuable when compared to hard dollar up-front costs that are required for the investment. These savings may not be adequate to offset some of the upfront costs, and therefore may not yield a true measure of the projects potential costs and benefits.

Overall, the ROI calculation provides a valuable comparison of the net benefit verses total cost, a ratio that can point towards a solution that delivers optimum financial benefits. But ROI alone is not the only indicator of performance, and should be considered with other factors such as NPV Savings IRR and payback period prior to making a purchase decision.

Net Present Value (NPV)

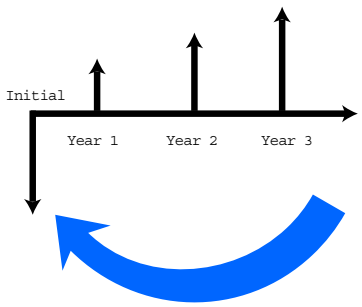
NPV Definition: The sum that results when the discounted value of the expected costs of an investment are deducted from the discounted value of the expected returns. [26]

The Net Present Value (NPV) benefit is a calculation that measures the net benefit of a project, in today's dollar terms. The NPV savings calculation consists of two financial concepts, these are:

- The "net" part of the NPV savings calculation is the difference between all of the costs and all of the benefits (savings and other gains).
- The present value portion of the NPV calculation takes into account the time value of money, to adjust the expenditures and returns as they occur over time so that they can be evaluated equally.

As described earlier, money has a time value, where future payments need to be higher to be equivalent to today's dollars. This time value accounts for the fact that money invested could earn interest elsewhere, also known as the opportunity cost. As well, time value can account for the fact that investment money needs to be borrowed at a specific rate so that it costs the company to borrow over time, the cost of capital. The NPV calculation evaluates a set of costs and benefits over time in order to account for the time value of money. The cash flows are the amounts and times of the various costs and investments, and these are brought into a common term, today's dollars, so that the net benefit can be evaluated.

[26] The Dictionary of Modern Economics, 4th Edition, The MIT Press, Edited by David W. Pearce



Using the same example as that used for the ROI calculation, lets say that a company invests $100,000 in a new application, and that the application requires $25,000 annually thereafter in maintenance and support costs. From this investment, the company expects to save $200,000 each year. An analysis of this investment over three years would yield the following negative (costs) and positive (benefit) cash flows:

	Initial	Year 1	Year 2	Year 3	Cumulative Total
Total Costs	$ 100,000	$ 25,000	$ 25,000	$ 25,000	$ 175,000
Total Benefits	$ -	$ 200,000	$ 200,000	$ 200,000	$ 600,000
Net Benefits	**$ (100,000)**	**$ 175,000**	**$ 175,000**	**$ 175,000**	**$ 425,000**

The cash flows from this investment are shown as the Net Benefit, the Total Benefits minus Total Costs: a cash flow of -$100,000 initially (year 0), with $175,000 in year 1, year 2 and year 3.

The NPV Savings calculation seems intimidating when expressed as a formula, however, when demonstrated in practical terms, is quite intuitive. To express it in its most difficult terms first, the NPV calculation uses the formula:

$$NPV = I_0 + \frac{I_1}{1+r} + \frac{I_2}{(1+r)^2} + \ldots + \frac{I_n}{(1+r)^n}$$

Where the *I* 's represent the net benefits for each year, with the *subscript 0* representing the initial net benefit, the *subscript 1* the year one net benefit, and so on. The exponent in the denominator is also equal to each year of the analysis, up to n, the number of years in the analysis term. The discount rate is *r* and is held constant through the analysis period.

To put the calculation in practical, step-by-step terms, we will use the calculation applied against our example cash flows. The net present value calculation, using a cost of capital/discount rate of 7%, takes the initial costs and ongoing costs and benefit cash flows, to create a single net cost or savings figure. For the example set of cash flows above, the net benefits are as follows:

Initial = I(0) = - $100,000

Year 1 = I(1) = + $175,000

Year 2 = I(2) = + $175,000

Year 3 = I(3) = + $175,000

The initial expense of $100,000 is not discounted, because it is already in today's dollars terms. Year 1 through Year 3 however need to be adjusted to be brought into today's dollar terms, and are calculated as follows:

NPV Year 1 = $175,000 divided by (1+ .07) = $163,551

NPV Year 2 = $175,000 divided by (1+.07) squared = $152,852

NPV Year 3 = $175,000 divided by (1+.07) cubed = $142,852

The total NPV savings is the sum of the initial expense, and the three-year NPV analysis, represented as:

NPV Savings = - $100,000 + $163,551+ $152,852 + $142,852 = $ 359,255

As can be seen, the net benefits from later years are discounted more in today's dollar terms such that they mean less in the overall analysis. As a result, the total NPV savings is only $359,255, compared to the cumulative benefits of $425,000, when the discount rate is not considered.

Because of the properties of the net present value calculation to increase the impact of current costs and near term savings, while reducing the impact of future costs or benefits, the following holds true:

Projects with high initial costs and with savings that grow slowly over time yield lower NPV savings values
Projects with low initial costs and greater initial savings yield higher NPV savings calculations.

The NPV Savings is one of the most popular and accurate methods used to assess IT project viability, using discounted cash flow to accurately quantify the net benefits from a project. Rather than the ROI percentage, a ratio of net benefits to the costs, the NPV savings uses discounted cash flow to quantify in today's dollar terms the projected net gain from the project in net dollar terms.

Like the ROI formula however, it alone cannot determine whether a project is viable. As an example, a project may yield a substantial $100M NPV savings over a three-year period, but the required initial investment of $10M may be so risky for the company, that it is not considered a prudent risk. As well, a project might have a large NPV benefit, but has a long payback period and derives much of its benefits through huge gains in outgoing years.

Internal Rate of Return (IRR)

IRR Defined: It is the DISCOUNT RATE which makes the NET PRESENT VALUE of a project equal to zero[27]

In mathematical terms, Internal Rate of Return is the projected discount rate that makes the Net Present Value calculation equal to zero. From the prior section, the NPV formula is defined as:

$$NPV = I_0 + \frac{I_1}{1+r} + \frac{I_2}{(1+r)^2} + \ldots + \frac{I_n}{(1+r)^n}$$

The IRR calculation is used to derive the value of r, whereby given a series of net benefits (I), the equation yields zero as the NPV. The calculation is performed iteratively, where a computer program guesses at the value of r, and then continuously refines itself, until the equation yields a result at or near zero.

In practical terms, the IRR calculation examines the positive and negative cash flows from a proposed project, and generates an interest rate. ***This rate represents the value another investment would need to generate in order to be equivalent to the cash flows of the investment being considered***. For our example used in the NPV savings calculations, a series of net cash flows is defined as:

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[27] The Dictionary of Modern Economics, 4th Edition, The MIT Press, Edited by David W. Pearce

Initial = I(0) = - $100,000

Year 1 = I(1) = + $175,000

Year 2 = I(2) = + $175,000

Year 3 = I(3) = + $175,000

For this set of net cash flows, the IRR calculation that yields an NPV of zero is 166%.

The IRR calculation is a valuable calculation in that it generates a projected return that can be directly compared to the company's hurdle rate. The hurdle rate is typically the risk adjusted return a project needs to generate in order to be considered. Risk adjusted returns need to be substantially higher than those generated by safe investments in order to be considered equivalent. Hurdle rates across all corporate initiatives might range from as low as 15% for safe investments to over 100% for the riskiest of projects. Due to the complexities associated with new technologies, the short lifecycles of these investments, and the process changes that accompany them, IT project returns are often highly discounted as to the reliability of achieving promised returns within the designated analysis period. IT project hurdle rates of 50 to 100% are common corporate standards.

The value of a high IRR and why hurdle rates are used can be demonstrated in capital market terms. When making a personal investment, money in a savings account is insured, but only yields a 3 to 4% interest rate, while a highly rated bond is not insured, and can generate a modestly risky 5 to 6%, and an equity investment is relatively risky and returns an average gain of 10%. The equity investment needs to generate higher potential returns before you would consider taking on the risk of not having an insured investment. If the equity investment only yielded 5 to 6%, is the marginal gain worth the extra risk? This is the hurdle rate, the rate at which the investment makes sense given a specific risk profile and tolerance. A high return above the hurdle rate provides a return that exceeds the relative risk.

By calculating IRR, a corporation can consider whether the projected risks of applying capital and labor resources to the project are worth the returns.

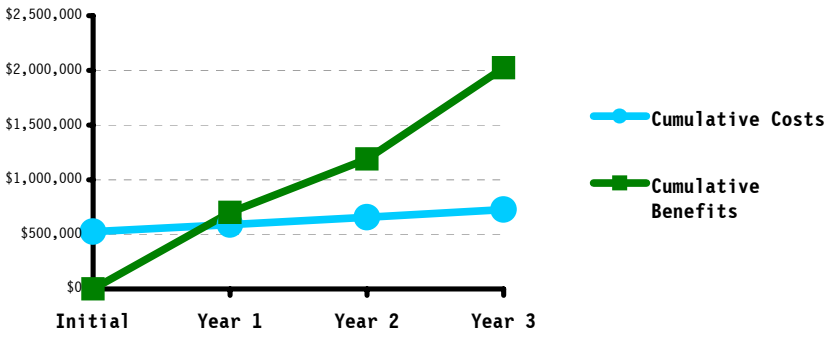
As with the other formulas, IRR also has its weaknesses. As with ROI, it fails to communicate how much investment or benefit is achieved in dollar terms, and does not communicate time to payback.

Payback Period

The time period from the start of the project until the cumulative cash flow turns positive

Perhaps the easiest calculation to understand in traditional ROI analysis is the payback period. The payback period is the time frame it takes for the project to yield a positive cumulative cash flow, typically specified in months. The payback period is measured from the start of the project, until the occurrence when the cumulative benefits, exceed the cumulative costs. On a graph of cumulative benefits and costs, it is the elapsed time from project start to the point where the lines cross (see figure). This point is often referred to as the breakeven point.

	Initial	Year 1	Year 2	Year 3
Cumulative Costs	$ 523,000	$ 588,000	$ 656,000	$ 726,000
Cumulative Benefits	$ -	$ 700,000	$ 1,190,000	$ 2,023,000



Payback period is important because it measures how long it takes for the investment to begin generating a positive cash flow. A longer payback period generates risk, especially if the project time line is delayed or benefits occur later than expected. A shorter payback period does not assure substantial returns for the investment, but assures that there will be positive returns and that the benefits occur early in the cycle and quickly offset the initial investment costs.

Payback period too has its issues, failing to communicate the value of returns, only the time to returns.

Running "What-if" Scenarios

"Most IT managers are far from frivolous when it comes to professional investments. When millions of dollars and the productivity of departments are at stake, managers know they must spend wisely and carefully, especially when budgets are tight. The trouble arises when they have to forecast a return on investment long before a technology is purchased or funds are allocated." – Paula Klien, Managing Editor for Special Projects, InformationWeek.

When the costs and benefits have been quantified, and the analysis results tallied, one of the best ways to determine if a project is viable is to run "what-if" scenarios. Often, business cases are developed aggressively, with much risk of hidden costs and optimistic benefit estimates. This is natural, as the business case does not take into account unforeseen risks. To factor in the possible risks of holding costs to plan, and achieving projected benefits, "what-if" scenarios can be run.

What-if the implementation and ongoing support and maintenance costs are 50% higher, or even double those expected? What if the predicted benefits are half? Does the project still deliver adequate returns? A quick scaling of the implementation costs and derived benefits can determine if the unexpected can de-rail the expected benefits and not provide a high enough ROI to meet risks.

Case Study: Applying "What-If" analysis to determine sensitivity

A software solution is expected to cost $1.2 million to implement, with $560,000 in implementation labor costs. The solution is expected to cost $250,000 annually in on-going maintenance and support labor. The benefits are expected to be $2.9 million in labor and operations savings per year. As is, the solution is expected to yield:

- *NPV savings = $6.5 million*
- *IRR = 471%*
- *ROI = 564%*
- *Payback period = 4 months*

By applying "what-if" analysis, a doubling of the implementation costs, and a reduction of the predicted benefits by 50%, reveals:

- *NPV savings = $1.4 million*
- *IRR = 66%*
- *ROI = 73%*
- *Payback period = 16 months*

The business case is still positive, although the returns have been reduced below typical hurdle rates and the payback period is 1.5 years. However, risk has been factored into this plan with the doubling of implementation costs and the predicted benefits halved. Therefore, the business case still makes sense. The good news is that it is unlikely that there will be a doubling of costs and a halving of benefits and that even if this occurs; the business case still yields benefits.

Calculating Costs

"We have found that when people are trying to calculate ROI, their biggest challenge is trying to understand their own costs, especially where there are a lot of people wearing many different hats" – Tom Brennan, VP Marketing ASP ManagedOps.com – ComputerWorld

Now that the net tangible benefits of the ROI analysis are understood, how do you collect the data to actually calculate the ROI results? Cost collection can be the most complex and frustrating of the activities of measuring ROI if those who attempt do not have a clear idea of what they are trying to collect. The first simple step however, requires designating a chart of cost accounts based on metrics that can be easily, readily and repeatedly collected. Methodically collecting a standard set of metrics - such as licensing costs, labor costs, and capital expenditures - makes estimating project labor requirements and crunching the numbers to project total costs relatively straightforward. The chart of accounts is a set of standard buckets into which costs will be tallied and a framework for these costs is suggested below.

Chart of Accounts for Costs

All of the costs that compose a project need to be specified, covering all aspects of the project lifecycle. Careful thought and planning into the chart of accounts will assure that no significant capital costs are overlooked, and that tasks and labor costs are well understood. Specifying a complete chart of accounts is essential for creating a valid ROI analysis.

A chart of accounts for an IT solution will include standard categories such as:

- **Capital Expenses** – the investment in systems, software, networks, peripherals, supplies and equipment to deploy and maintain the project
- **Implementation Labor** – the staff and contract labor to research, purchase, plan, test and deploy the proposed solution
- **On-going Management and Support –** the staff and contract labor to manage and support the solution after it is deployed
- **Operations and Contracts –** the recurring fees, leases, facilities and power costs, and the on-going maintenance and support contracts

For each of these overall cost categories, a detailed chart of accounts is created to detail the required expenditures. For a specific project, working with your team and vendor in a brainstorming session is a great way to develop a specific chart of accounts for the planned project.

Capital Expenses

For Capital Expenses, the investment in systems, software, networks, peripherals, supplies and equipment to deploy and maintain the project, the following chart of account items may apply:

Capital Expenses:

Software

- User operating system licenses
- User application licenses
- Server operating system licenses
- Server application licenses
- Development Tools
- Configuration Management

Systems

- Servers
- Desktops
- Mobile computers
- PDAs and mobile devices

Network

- Routers
- Hubs
- Firewalls
- CSU/DSUs
- Cabling

Peripherals

- Printers
- Storage
- UPS and Backup Power Generators

Supplies and Equipment

- Image and Installation Tools
- Configuration Control Software

For each of the capital expenses in the chart of accounts, the number of units required and unit costs should be recorded and tallied to create a total cost.

A simple capital cost analysis for a project may be specified as follows:

Item	Units	Unit Cost	Total Cost
User licenses	1000	$100	$100,000
Server license	10	$10,000	$100,000
Total Software Licenses			$200,000

It should be noted that certain capital expenses are depreciated, taking the initial purchase price, and accounting for it over the useful life of the asset. Therefore, the costs would not appear as an initial expense in the analysis, but over time. The analysis of capital depreciation is described more fully in Appendix D, which addresses GAAP accounting standards.

Implementation Labor

For implementation labor, the staff and contract labor to research, purchase, plan, test and deploy the proposed solution, the following chart of account items may apply:

Implementation Labor

- Research and Evaluation
- Planning
- Contracts and Negotiations
- Procurement
- Approval
- Formal Training
- Independent Learning
- Testing
- User Communications
- Internal Communications and Meetings
- Application and Database Development
- Creative Services
- Configuration
- Deployment
- Travel Time

For each, specific person, titles should be assigned, and the average salary of the participants should be calculated. The average salary rate should be fully burdened, accounting for all facilities costs, taxes and benefits. The hours required for each line item should be estimated by the team, and verified from vendor case studies and experience. By taking the total hours required for each task, and the average hourly rate, the labor costs for implementation can be calculated. This activity based planning may be represented as follows:

Task	Assigned	Avg. Hourly Burdened Labor Rate	Person Hours	Total Cost
Research	Systems Administrator	$ 48.00	20	$ 960
Planning	Systems Administrator	$ 48.00	40	$ 1,920
Procurement	Procurement Specialist	$ 35.00	25	$ 875
Formal Training	PC Technician	$ 30.00	16	$ 480
Independent Leaning	PC Technician	$ 30.00	16	$ 480
Testing	PC Technician	$ 30.00	100	$ 3,000
Deployment	PC Technician	$ 30.00	40	$ 1,200
Total				**$ 8,915**

On-going Management and Support

For On-going Management and Support, the staff and contract labor to manage and support the solution after it is deployed, the following chart of account items may apply:

On-going Management and Support

- Continued Review and Planning
- Database, User and System Administration
- Application Maintenance and Continued Development
- Reporting
- Continuous Training and Learning
- Tier 1 support (call center operators)
- Tier 2 support (advanced help desk support)
- Tier 3 support (subject matter experts and dispatched support)

As with the labor related costs for implementation, these costs are tallied in a similar way. Activity based costing using labor costs and hours for each task is preferred. However, for ongoing management and support rather than the costs being an initial cost only, the costs are annual.

For out-going years in the analysis, the labor costs for ongoing support and maintenance may be scaled to include annual salary increases as appropriate.

Operations and Contract Expenses

For Operations and Contracts Expenses, the recurring fees, leases, facilities and power costs, and the maintenance and support contracts, the following chart of account items may apply:

Operations and Contracts

- Telecommunication Subscription Fees
- Software Subscription Fees
- Maintenance and Support Contracts
- Equipment Leases
- Facilities Rent
- Power
- Professional services
- Contract Labor
- Training Class Fees
- Travel and Expenses

The costs for operations and contracts are calculated much as the capital expenses, but are tallied as either an implementation expense (such as Training Class Fees and Contract Labor) or, for each year as an on-going expense (such as Facilities and Power expenses, and support contracts).

Now that the cost section of the ROI analysis is understood, we will examine the art of estimating and deriving benefits.

Quantifying the Tangible Benefits

"There's a growing mandate for companies to come up with new and innovative ways to improve business practices and to bring policies more closely in line with goals. IT often supplies the enabling technologies that implement and automate these policies. For an IT manager, this means coming up with the tools that will help the business and its employees get, retain and better service customers. Given the current economic climate, that means deploying systems that have a demonstrable impact on these business goals: increasing revenue and decreasing costs." – ROI: The IT Department's Moving Target, Ron Copeland, InformationWeek.

As mentioned earlier, the tangible benefits of a solution are typically grouped into four categories – Labor Savings, Capital Expense Reduction, Productivity Benefits and Business Benefits. Each category contains a methodology for calculating the potential tangible benefits.

Most find the task of estimating the tangible benefits as the most daunting task of the analysis. With a template to guide the derivation of the tangible benefits, and some basic use of standard metrics and data collection, most IT professionals can calculate the tangible benefits without too much trouble.

Labor Savings

The Labor Savings are tangible benefits derived directly from expected headcount reductions. The labor savings category is used to analyze potential IT staff reductions, both employees and contract labor, due to infrastructure solutions, or improvements to business and user applications that require less support than current solutions. On average, IT labor consumes more than 60% of the IT budget including management, systems administrators, technicians, help desk, support staff and application developers. Because of these budget expenses, certain infrastructure projects or improvements can provide more efficient management and support processes, and deliver ample benefits in IT budget cost reductions.

Some labor categories that can be improved include:

- Support including help desk and dispatched support
- System administration and PC technicians
- Data/Voice Network engineers
- Storage managers and backup administrators
- Asset Managers
- Architecture planning and IT management
- Application and Internet/Intranet developers
- Trainers
- Configuration control staff and librarians
- Procurement and Contracts
- Operations staff

To calculate the potential to improve the efficiency of IT management and support, and derive the savings, it is important to understand the total headcount, and in general, what activities the staff members are performing. Certain sections of IS departments have good records, while others have little documentation. The help desk is often well documented, where help desk logs can be analyzed to determine which issues are developing the most calls and how long it takes to resolve such issues.[28] As well, the number of calls that are handled directly by the help desk support staff, or that require dispatch is often well documented. Unfortunately, most IS organizations do not track the time of more costly systems administrators, network engineers and other managers, making it difficult to know how and where there time is spent, and how planned improvements will derive savings.

Case Study: Help Desk Metrics

To study the performance of help desks is fairly easy because most of the call management and logging systems, and certainly more advanced CRM systems, contain the ability to track and report on various metrics. Unfortunately, 65% of the companies we have worked with had not examined their help desk logs prior to trying to assess their IT performance – even though the help desk is the front line for handling user issues and maintaining user productivity.

By collecting and comparing the following metrics, trouble spots can be uncovered and business cases developed for improvement.

Typical Call Center Metrics	**Technical Help Desk**
Average Number of Calls (monthly)	21,250
Call Response	
> Abandoned	6%
> Automated	4%
> Agent Handled	90%
> Average Queue Time	60 seconds
Call Handling	
> Tier 0/1 (routing/basic)	70% - 8 minutes avg. to resolve
> Tier 2 (advanced)	23% - 24 minutes avg. to resolve
> Tier 3 (expert/dispatch)	7% - 96 minutes avg. to resolve
Cost per Call (excluding abandoned calls)	**$17.00**

Top Ten Help Desk Calls

Service Call	Percentage of Calls
Password Issue	16%
Applications How-to	16%
Remote Connectivity	15%
Windows Issue	14%
PC System Issue	10%
Network Down?	10%
Printer Issues	8%
E-mail issues	6%
Database issues	3%
Restore/Recover Data	1%
Other	1%
Total	**100%**

As well as the tasks, it is important to know either specifically, or using averages, the salaries of the staff, or salaries by titles.

For labor savings, total headcount reductions are sometimes used, but these are difficult to derive and verify. It is often more appropriate to do a more bottoms up analysis through activity based costing. The cost of specific activities can be calculated within today's IS environment. Then, the features of the proposed solution can be applied to derive savings- the labor saving benefits. This bottoms-up approach is the easiest to research and validate, because current tasks can be analyzed, and it is relatively easy to perform research on how specific product features can save time over current methods. This can be represented as:

Task time (annual person hours) * labor rate * savings = derived labor savings

or

Number of times task performed per year * time for each task * labor rate * savings = derived labor savings

The IT vendor, independent analysts or staff can collaborate to estimate how much timesavings can be derived from the proposed solution. It is easiest to derive task savings, by examining how much time IT staff spend on given tasks that relate to the issues the proposed project will solve, the total cost to the organization for such tasks, and how much time can be saved through the proposed IT productivity solution.

Often times, planners are reluctant to translate task savings into headcount and apply the salary savings as benefits in the analysis because they do not want to imply that layoffs will occur. But through these individual time savings, staff can be re-allocated to more productive tasks, not replaced for attrition, not be added when the business grows, or in some cases eliminated for realized cost savings to the corporate bottom line. The reality is that time may be saved on individual tasks, but not directly translate to headcount savings and resultant bottom line corporate benefits. Never-the-less task savings must be translated into headcount reductions or productive re-assignment to new tasks in order to generate bottom line corporate benefits in the ROI analysis. However, the expectation should not be set that labor savings directly translate into layoffs – only into benefits that may be recognized in any number of ways.

Many times the strategic value of the reallocated staff can exceed the single headcount savings analysis, which represents significant upside potential.

Case Study – Enterprise Policy Management

For a simple scenario of how labor savings can be calculated, let's examine a sample implementation of a PC management solution. For our sample, a PC lockdown solution is being considered to help reduce the total cost of managing distributed PCs. The solution works by controlling unnecessary user access to sensitive network and system files and settings, thereby eliminating the risk of costly accidental corruption by users. The solution can help reduce help desk support costs, reduce the need for dispatched support, and reduce systems administrator tasks by maintaining standard configurations and preventing corruption repairs.

By examining the help desk logs in our sample company, it is determined that over 20% of the 2,000 support calls a month are generated because of system configuration and corruption issues. Of these calls, over 50% required the help of an expert (tier II support), and 25% required dispatched support (tier III support). From the help desk logs, the support staff required 15 minutes to resolve a basic support call, 30 minutes when expert support was required, and over 1 hour for dispatched support, which includes travel time between three local facilities and back office repair work.

To calculate the total cost of system issues to the organization, the number of calls, time to resolve the calls and average burdened salaries for each class of support are factored. The support costs for the 1,000-user organization used in this scenario is over $75,000 per year, and can be summarized as follows:

	Total Support Calls Per Month	System Related	Needing an Expert (Tier II)	Needing Dispatched Assistance (Tier III)
Support Calls	2,000	400	100	50
Avg. Minutes of Support Staff Required		15	30	60
Avg Burdened Salary		$ 21.88	$ 34.38	$ 46.88
Total Monthly Cost		**$ 2,188**	**$ 1,719**	**$ 2,344**

Monthly System Support Cost:	**$ 6,250**
Annual System Support Cost:	**$ 75,000**
Annual Cost per User from Systems Support Issues:	**$ 75**

Now that the current costs for the related help desk tasks are understood, the total opportunity for potential savings, the benefits of the proposed solution can be can be applied, to estimate solution savings. The savings estimates are often more art than science, mostly because benefits research rarely expands to a large enough universe to be scientifically relevant, and each company is unique, so general savings figures rarely apply. With this in mind, the possible savings can be derived:

- *From vendor claims, backed up by real world case studies that have relevance to your application*
- *From interviews of the IT staff at reference accounts provided by the solution providers*
- *From analyst estimates, derived from multi-client*
- *Results from test lab trials as well as staged deployments to trial groups*

The closer the IT vendor can come to providing real world, relevant data, and the IT management team can come to obtaining validated metrics, the better the business case will be. However, this is difficult in real world situations, so most of the time, the analysis relies on vendor or analyst case study savings estimates. As the project evolves, these estimates can be replaced with more refined case studies and real world data. It remains critical that all parties to the analysis become familiar

with the estimates and assumptions embedded in the potential savings and accept them as reasonable. It is also recommended that a combination of savings metrics from solution providers, analysts, case studies and experience be applied to determine the range of possible benefits.

For our example scenario, the vendor of the proposed PC lockdown solution has several important corporate installations, and they have partnered with these companies to understand and refine the savings metrics. These case studies have provided real world estimates on savings such as support cost reductions, and these initial estimates can be used for most environments as an initial starting point. Overall, when strict policies are implemented on the PCs, over 20% of the system calls can be reduced. For this scenario, estimated savings of $14,000 per year in support labor. This may not be enough by itself to reduce actual costs as the savings are spread over tier 1, 2 and 3 level support personnel – however, the savings will likely result in enhanced capability for the help desk to support more serious issues effectively, and reduce peak loads.

To recap, the labor saving benefits are best calculated on an activity basis, and can be calculated in six steps as follows:

1. Calculate time spent on each related task
2. Calculate average labor cost per task
3. Calculate total costs per task
4. Estimate derived savings
5. Calculate savings
6. Scale the savings by that which the company can actually realize

A small sample of projects that can be implemented to save IT labor includes:

- Network and systems management
- Directory services
- Enterprise policy management
- Manageable and fault tolerant computer systems
- PC standardization and manageable PCs
- Server consolidation
- Wireless LANs
- Remote management and support
- Support database and automation systems
- Security
- Storage management automation and SAN
- Procurement automation systems and B2B platforms
- Application development and configuration control environments

Capital Expense Reductions

Capital Expense Reductions are the savings in operational expenses such as office supplies, printing costs, power or facilities expenses. The calculations of capital expenses and savings are quite easy for most projects, involving a cost analysis of the expense, and then applying a savings factor to generate the benefit.

Calculating the capital expense often requires some research into department budgets and working with finance or operations to understand the total annual costs. Some examples of possible capital expenses include:

- Computer systems
- Network equipment
- Printers and Peripherals
- Tapes and Removable Media
- Telecommunications
- Paper and Printing
- Raw materials
- Inventory
- Office Supplies
- Warehouse Equipment
- Catalogs and manuals
- Transportation and Delivery
- Travel
- Power Usage
- Facilities
- Construction
- Maintenance, Support and Warranty contracts

Case Study: Demo Automation with an Online Meeting Center

Because of recent perceptions regarding online flight safety, and the goal to reduce travel spending, online meeting and demonstration centers have been proposed as a possible solution. The sales force, to help reduce the number of client visits required to demonstrate solutions, proposes that an online meeting center be implemented. To calculate the potential savings, it is estimated that sales performs 65 live demos per month. Of these demos, 20% require local travel, under 1 hour of travel time each way, 30% requires local travel between 1-2 hours of travel time each way, 10% requires local travel over 2 hours each way, and 40% requires air travel. Because some of the trips are shared with several client visits, calculating the costs is made difficult, but not impossible. The sales executives estimate that the sales costs for travel are typically shared amongst 3 prospects, allocating 30% of these costs to any given demo. The sales costs are tallied as follows:

Demo Profile	Sales Time	Labor Rate	Total Time Costs	Travel Fees	Allocation	Total
Local under 1 hour	1	$ 61.66	$ 61.66	$ 14.00	30%	$ 65.86
Local from 1 to 2 hours	2	$ 61.66	$ 123.32	$ 26.25	30%	$131.19
Local over 2 hours	4	$ 61.66	$ 246.63	$ 42.00	30%	$ 59.23
Airline travel	6	$ 61.66	$ 369.95	$800.00	30%	$ 09.95

Demo Profile	Total Cost	% of Total Calls	Total Calls of Type	Total Cost
Local under 1 hour	$ 65.86	20%	20	$ 1,317.20
Local from 1 to 2 hours	$ 131.19	30%	30	$ 3,935.70
Local over 2 hours	$ 259.23	10%	10	$ 2,592.30
Airline travel	$ 609.95	40%	40	$ 24,398.00
Total				**$ 32,243.20**

The total demonstration travel costs are currently estimated at $32,243 per month – the total opportunity that can be addressed by the demo center. An online meeting center has the theoretical opportunity to save this entire amount in travel cost avoidance and productivity gains if all travel could be eliminated.

The estimated costs for the meeting center, demonstration licensing costs, and telecommunication costs are $5,000 per month with no other costs needed to manage or support the center. An analysis for a single month shows that only 15% of the demos would need to be avoided to breakeven. With the sales force estimating that 50-75% of the demos and travel can be avoided the benefits could be very substantial. All of the operational savings in travel time can indeed be counted into the bottom line corporate benefits; however, we need to be conscious to scale the benefits reasonably. For example, three considerations should to be given to the productivity gains, the first two could lead to more potential benefits, although somewhat intangible, while the third can impact how much of the savings will translate into bottom line business benefits:

1. *Even greater gains can be made because the saved time can translate into more sales call time.*
2. *The savings in travel wear and tear will hopefully lead to a more productive, happier sales force*
3. *Not all of the saved demo time will translate into productivity savings or additional sales calls, because the salespeople were using their own time for some of the travel, and will not use all of the work time that was used for the travel for productive business work*

The typical formula for capital expense reductions is:

Expense * % Reduction = Savings

The calculation of capital expense reductions can be performed in four easy steps:

1. Calculate the unit cost and total annual expense of the line item
2. Derive potential savings in units or as a percentage reduction
3. Calculate the savings
4. Scale the savings downward if the full benefit cannot be realized as bottom line savings to the corporation.

A small sample of projects that can be implemented to deliver capital cost reductions include:

- Supply chain management
- ERP systems
- Business to business trading platforms
- Marketing and PR automation
- Online e-commerce
- Vertical office automation solutions
- Voice over IP telephony
- Consolidation
- Mobile office automation
- Online demonstration and meeting centers
- Corporate Intranet and online manuals
- Distance Learning
- Virtual storage systems
- Server consolidation
- Efficient printers
- Wireless LAN

Productivity Benefits

Productivity Benefits are the gains in user productivity from implementing a solution, including:

- **Productivity Gains** – efficiency gains in performing specific user tasks, resulting in productivity benefits
- **Productivity Loss Avoidance** - reductions in system downtime, eliminating lost productivity

As with labor savings, productivity savings analysis can be performed using activity based costing. This typically requires a tally of specific user tasks, a costing of each task, and then an estimated savings application from the proposed solution. The formula for productivity benefits is as follows:

Current task time * savings * labor rate = Productivity Gain

Current productivity loss * savings * labor rate = Productivity Loss Avoidance

Case study: Higher Availability

A newer more reliable version of an operating system is available, which claims to improve user uptime. It has been estimated by analysts that each user experiences an average of 2 hours of downtime per month, and that the new operating system can reduce the current downtime issues by 40%, to only 1.2 hours per month, representing reliability of 98.6%. The productivity savings calculation for the improved uptime of a 1,000 person-computing environment would be as follows:

Monthly System Downtime (in hours)	User's Average Hourly Burdened Salary	Monthly Downtime Cost for 1,000 users	Estimated Savings %	Monthly Savings	Annual Savings	Annual Savings per User
2	$ 25.96	$ 51,923	40%	$ 20,769	$249,231	$ 249

The uptime savings alone could pay for the system upgrade, however, productivity savings and gains are often viewed as "soft" benefits, as opposed to the "hard" benefits of operational cost savings and labor savings. Indeed, will the savings in downtime yield a more productive workforce? Will the 0.8 hours of monthly uptime gains translate directly into 0.8 hours of productive work time? It is doubtful that 100% of the savings will result in increased productivity. Typically, it is recommended that no more than 50% be used. Because of the lack of a direct translation of savings to realized benefits, the productivity gains are often discounted. If only 25% of the downtime improvements were being realized as bottom line benefits, $62.25 per user of the savings would be applied in the ROI analysis. However, this should be enough to help justify and gain substantial benefits from the proposed upgrade.

Some typical productivity benefits could include:

- Decreases in time to process a customer call and take an order
- Decreased corporate paperwork and processing time
- Reduced inventory and stocking time
- Decreased system processing wait time
- Reduced system downtime (non-availability of computer, applications and key network and telecommunication resources)
- Reduced futz (users changing system settings, playing games and other non-work related tasks)
- Reduced peer support (users helping each other to solve system and application issues instead of referring to formal support)

Productivity benefits do not always deliver bottom line gains to the corporation, and should be discounted in any ROI analysis. User productivity gains generate timesavings for users. Some of these time savings will result in users spending more time on tasks that can potentially generate additional revenue for the company, or derive less tangible shareholder value such as increased intellectual capital. However, not all of the gains translate into productive tasks. The savings may result in users spending more time on personal items such as non-work related Internet time, personal e-mails, or socializing with other workers. Therefore, productivity gains are often discounted by at least 50%, to account for the lack of direct translation to bottom line benefits from the proposed solution.

The productivity benefits can be calculated in six steps as follows:

1. Calculate time spent on each related task
2. Calculate average labor cost per task
3. Calculate total costs per task
4. Estimate derived savings
5. Calculate savings
6. Scale the savings by that which the company will realize by factoring in non-productive conversion and risk

Projects that can be implemented to drive increased user productivity include those that eliminate downtime or waste inherent in today's systems or workflows, and more importantly, those that drive increased employee capability. Solutions that derive most of their gains from productivity benefits include:

- Office automation such as office suites, e-mail, document management, wireless LANs, order entry and telephony.
- Vertical automation solutions such as customized office management software and document management systems
- Downtime reducers such as uninterruptible power systems, high availability servers, backup systems, desktop management, policy management and network management systems

Business Benefits

"The area where most folks are likely to get into trouble is in defining and quantifying real business benefits.". – ROI: The IT Department's Moving Target, Ron Copeland, InformationWeek.

Business benefits are the gains in profit resulting from revenue gains such as those from increased customer acquisition and conversion percentages, and increased customer retention. Business benefits are typically generated by increases in company revenues due to the planned project. Some typical business benefits include quantifiable revenue gains as a result of:

- Reduced sales cycle
- Increased customer conversion
- Increased sales opportunities
- Increased market share
- Increased employee knowledge
- Increased competitive advantage

As with productivity benefits, business benefits can also attempt to quantify the loss avoidance from business downtime. Two out of five enterprises that experience a disaster — consider such events as Hurricane Andrew in South Florida or the loss of the World Trade Center in New York — go out of business within five years. Business continuity plans and disaster recovery services ensure continuing viability. When there is a risk of business loss that can be predicted, such as the losses from downtime, business loss avoidance savings can be calculated. Some business losses that may be avoided including:

- Corruption of information and systems (intentional and accidental)
- Reduced digital and physical theft
- Avoided information disclosure and public relations issues
- Prevented illegal activities and fraud
- Physical losses and damage from terrorism and natural disasters
- Slowed operations, business interruptions, and lost customers

Often in an ROI analysis, business benefits are the most difficult to quantify precisely. With regard to sales oriented benefits, these tend to be easier, while those regarding business loss avoidance, increased employee knowledge and increased market or competitive advantage are more difficult to pin a precise revenue gain to. When tallies are indeed possible, the benefits are often overly optimistic, requiring discounts for risk and bottom line business translation.

For business benefits some typical formulas are:

- **Average order amount * increase in order amount * number of orders = revenue gain**
- **Average number of customers * Average revenue per customer * % who do not re-order * increase in customer retention = revenue gain**
- **New leads per year * current close efficiency * average size per deal = revenue gain**
- **Sales cycle * Reduction in sales cycle * sales per month = revenue gain**

For business loss avoidance, the calculations involve the potential losses when an event occurs, some typical formulas include:

- **Typical business impact of security breach * typical number of events per year for a similar company* personal risk of occurrence (%) = business loss**
- **Number of orders per time period (hour, day) * time to recovery * risk of occurrence = business loss**
- **Number of users effected * time to recovery * revenue per employee * risk of occurrence (%) = business loss**

It is essential, when calculating business benefits, that the revenue gain or loss be scaled by the company's profit margin to determine the bottom line benefits. This can be represented as follows:

Revenue gain or loss * profit margin = business benefit

Case Study: Customer relationship management (eCRM)

A company is considering the implementation of an eCRM solution which promises to increase customer loyalty and generate an increase of 30% on the amount of the average customer orders by personalizing additional product offers to the clients interests. The business benefit gains from such a solution might be calculated as:

- *Average customer order = $120*
- *Average number of customer orders per year = 1.5*
- *30% increase in orders = $54 per customer*

With regard to the revenue gains, it is important to consider not only the overall revenue against the expenses, but in most cases, compare the projected profit to calculate the net benefit. To do this, one must multiply the revenue by the profit margin. In our simplified eCRM example, it would be a mistake to take the total $54 gain to the company bottom line. Instead, the profit from the increase in revenue must be considered. In this example, there is a 25% net profit margin, so only $13.50 can be considered in the business case. However, with 2 million customer orders per year, a gain of $13.50 per client could net $27M to the company in increased profitability.

For some organizations, in some circumstances such as the heady growth days of the Internet boom, revenue growth was all that was important. Competitive advantage, market share, and collateral benefit may be incentive enough for some companies to undertake certain projects, and sufficient weight should be given to intangible benefits in these cases. But when each new toaster sold costs more to make and sell than the revenue generated – organizations must remain cognizant that increased sales will drive them into debt, and that volume will not make up for a broken business model.

As with Productivity Benefits, there is a risk that all of the predicted business benefit gains do not directly translate to increased profitability. As an example, even though an ROI sales tool campaign is projected to eliminate the lengthy cost justification process, and the sales cycle is expected to be reduced by 40%, a reduction in overall sales cycle for current opportunities might not lead to a direct increase in new sales opportunities. Therefore, the business benefit gains should be scaled by a reasonable risk factor of around 50% or less, whereby, only 50% or less of the gains will be realized against the costs.

The business benefits can be calculated in four steps as follows:

1. Calculate the unit gain in revenue
2. Calculate the total revenue gain across customers, transactions and/or employees
3. Calculate the profit benefits from the revenue
4. Scale the savings by that which the company will likely realize by factoring in risk

Many Internet and Intranet solutions that are on the top of IT priority project lists are designed to drive and deliver business benefits. These projects include:

- Wireless computing
- Sales force automation
- Business intelligence and knowledge management
- Data Warehouse and Mining
- Competitive intelligence
- Customer relationship management
- Corporate internet site enhancements
- ROI selling tools
- CD-ROM demos and sales/marketing presentation systems
- Marketing and PR automation
- Marketing and advertising campaigns

As well, security and management solutions are at the top of many lists, especially with the renewed awareness post the 9-11 disaster. Security and management solutions help to reduce potential business losses. These projects include:

- Security policy and disaster planning
- Firewalls
- VPN
- Backup systems and disaster recovery solutions
- Anti-virus solutions
- Encryption and authentication systems
- Intrusion detection systems
- Enhanced Password Protection
- Lockdown and configuration control
- Access control and monitoring
- Asset tagging and tracking
- Physical theft prevention
- Background employee checks

Section III: The ROI Dashboard – a New ROI Model

Why did ROI Analysis fall from favor?

"Strict adherence to ROI was frequently ignored as businesses worldwide spent a total of $2.2 trillion on IT last year to ensure that they would not be left behind in the technology and internet revolution" – Meta Group, Information Week article Payback Time: Making Sure ROI Measures Up, Mary Hayes

ROI Analysis fell from favor over the past four years, for many of the same reasons that the investment discipline in the traditional measures of evaluating a company's market value were abandoned during the irrational exuberance of the Internet Bubble. Financial discipline of ROI analysis, as with the analysis discipline of profitability was replaced by new economy measures such as unique visitors, click-through, growth potential and intellectual capital. IT investments, particularly e-business expenditures, were thought to inherently deliver competitive and market value gains. So much so was the potential for profit that the time it would take to perform an ROI analysis was seen as a threat to realizing the astounding gains to shareholders and employees from these projects.

Creating a new ROI model to Address Issues

"When the relationship between profits and IT is random, it doesn't mean you can't make money with IT." – Paul Strassmann

In the public markets, before the bubble burst, the market was driven by the potential of an idea – as to how much market share could be captured by a fast moving new economy company. When the bubble burst, suddenly the financial performance of a company became important. Suddenly, fiscal discipline such as profit, cash flow, debt ratios, revenue per employee and customer acquisition costs mattered again. At one time, prominent technology analysts focusing on securities, such as Mary Meeker would evaluate a company on traffic, click-through and business model potential. Now detail oriented financial analysts once again rule in a surprising backlash, enticing clients to invest on traditional fundamentals. The public markets proved that the new economy fad was short lived, and that sound traditional metrics such as expenses and profitability still matter.

As a result of the new public market metrics, corporate IT departments, as with every other department, are now being measured on bottom line impact. The pendulum has swung to put more credibility on the promise of hard bottom-line returns. The tangible fundamentals of a project need to make sense again in order to merit an investment.

Even with the lessons of the public markets, that fundamentals do matter in any investment, several IT journalists and pundits have criticized ROI analysis, as an outdated means of assessing a project's value. Of course most of this criticism was weighed at a time when new economy metrics were more important than they are today. Rather than discard the criticism, we want to embrace and

examine these criticisms. With the renewed interest in ROI, the criticism can help us to redefine traditional ROI analysis into a new and improved tool.

Journalists and industry pundits have sometimes criticized traditional ROI because it:

1. Does not include intangible benefits
2. Requires an investment
3. May not be used objectively
4. Does not include risk
5. Can be abused by overzealous IT solution providers

We will examine each of these critiques in detail, and revise traditional ROI analysis to resolve each issue.

Tangible verses Intangible Benefits

"Businesses won't abandon investments that are demonstrating soft benefits, such as happier customers and a broad reach around the globe, even though project managers can't easily prove immediate cost savings or increased revenue on a spreadsheet. Soft ROI typically calls into the areas of improving customer satisfaction, increased employee productivity and a better competitive edge, all of which are vital to business" – Mary Hayes, Information Week

This first criticism of traditional ROI analysis is that the analysis does not do an adequate job of considering non-financial benefits. Most benefits for a project can be quantified into dollar and cent gains in categories such as labor savings, operational cost reductions, productivity improvements or revenue/profit gains. But often, there are reasons to consider a project not because it can reduce costs, or because it delivers tangible revenue gains, but because it delivers harder to quantify benefits such as reduced market risk, increased strategic advantage, improved financial market perception, better employee morale, or any of a number of important business advantages.

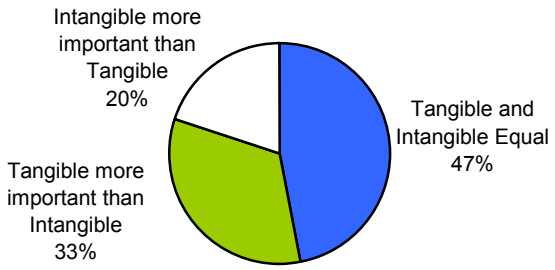


Figure 32: Which of the following best describes the importance your company places on intangible assumptions of benefits compared with standard ROI measurements when determining where to invest IT dollars? - Information Week ROI Study of 200 IT professionals.

The "harder to quantify benefits", which we will call intangible benefits, can be extremely important to the business as a growing concern and to long-term shareholder value. As such, ROI analysis should be advanced to include these elements as a key part of the analysis. An ROI analysis can include additional evaluation measures beyond just a quantified financial evaluation, to ensure that all aspects, both tangible and intangible, of the investment are considered.

To extend the ROI analysis, intangible benefits can be easily added to ROI analysis. The measure or intangible value can be grouped into the following analysis categories:

1. **Brand Advantage** – the change of or bolstering of a corporate brand image and worth
2. **Competitive Advantage** – the ability to more effectively respond to or leapfrog a competitor; the ability to increase the companies value relative to the competition
3. **Strategic Advantage** – the scalability to better anticipate market conditions or meet customer demand, and the ability to increase the companies value relative to the market in general
4. **Intellectual Capital** – the increase in the value of the company's brand, gains in employee morale, improvements in corporate culture, increase in staff knowledge and capability, and the ability to better manage, share and promote intellectual property across the organization
5. **Organizational Advantage** – the improvement or reinforcement of culture, and its ability to accomplish goals and improve market valuations

In an analysis that considers intangible benefits, the tangible benefits and financial measures such as ROI, IRR, NPV and payback can and should still be quantified. It is the combination of all costs and all benefits, both easily quantifiable and intangible which lead to ultimate gain in value for the company.

Case Study: Business Intelligence Systems

Many solution providers, when measuring their solutions using traditional ROI analysis, have a difficult time justifying the initial investment. Business intelligence systems can be difficult to justify on tangible gains alone. In their simplest sense, these solutions exist to help knowledge workers find important business, strategic and competitive information more effectively, often proactively mining the Internet, databases, e-mail and documents for pertinent information, matching vital information with those that need it most, and providing productivity tools for on-demand research. Solutions can cost hundreds of thousands of dollars for mid-size corporations to implement. Is this expense worthwhile?

To develop the tangible business case, one can look at the activities of typical knowledge workers and ways in which the business intelligence system can save time. Metrics such as:

- *How many information searches are conducted each month on the Internet, in documents and in databases?*
- *How long do the searches typically take?*
- *How much timesavings can be gained through business intelligence automation?*
- *Are there librarians and research assistants who can be re-allocated or reduced through the business intelligence systems?*

Indeed, although many claim there are not tangible benefits to these systems, a little research can uncover valuable cost savings for mining content and finding answers to important business questions. But these savings certainly do not address all of the valuable benefits of the business intelligence system. For most implementations, just looking at the tangible benefits will not be enough to justify the costs. For a given company:

- *What is it worth to proactively find key strategic information that may be buried in a competitor's web site, in a chat room, in a research note or press release on the Internet?*
- *What is it worth for the company to find potentially damaging disclosure of intellectual property or misinformation on a message board or in a chat room?*
- *What are the benefits of having co-workers in different locations connect on key strategic research and patents based on a search of their on-line knowledge profiles.*
- *What is it worth to have key performance metrics available to all workers daily, to increase visibility on important business trends?*

As indicated in the PIMS Program study, over 60% of a company's ability to achieve profitability is a result on market and competitive advantage. But it is clearly difficult to quantify these intangible benefits to improve market share, outmaneuver a competitor, or improve overall knowledge capital. The ability for business intelligence systems to help sustain the company's brand, improve the corporate culture, increase innovation and improve management aptitude far exceed the modest cost savings from improving the ability to find and recall information more effectively. The intangible benefits in competitive advantage, strategic advantage and intellectual capital can easily exceed the tangible benefits, and justify the solution.

ROI Analysis Requires an Investment

"The challenge is trying to balance the need for financial accountability with the rapid pace of change and the reality that some things can't be easily measured." – Mary Hayes, Information Week, Payback Time: Making Sure ROI Measures Up

An often-heard criticism, especially during go-go investment periods, is that the ROI analysis consumes too many resources to accomplish, and that it can be too time consuming.

However, the adoption of an effective ROI analysis and management program can lead to better decision-making. Projects that are being objectively selected will often have higher returns than those that would have been selected otherwise. In study after study, the value of proper project planning can yield substantial returns, and ROI analysis should be a part of every project planning session. When considering the costs of a typical IT project, planning is less than 3% of the total costs, yet ROI studies have indicated that proper planning can yield savings of 20% to 40% in reduced implementation, management and support costs, and yield even greater returns by guiding the company to the highest yield investments.[29] By using ROI as part of the planning process, more of the projects costs can be uncovered and planned, leading to less budget overruns. Resources can be allocated to those projects that derive the greatest corporate benefit. The time spent performing an ROI analysis should yield better understanding of costs and benefits, better resource allocation, and a higher return from each project.

To achieve a higher return from the ROI analysis, every effort should be made to make the ROI analysis as easy as possible, automating as much of the process as possible. It can take time to build an ROI framework and to populate the cost, benefit and analysis model with valid metrics.

The good news is that many boutique companies, several analysts and consultancies, and many IT solution providers have created spreadsheets or interactive software to provides the necessary ROI framework, and have populated many of the metrics driving typical costs and savings.

For sales professionals, these automated ROI selling tools help save time in the sales process, automatically developing the cost-justification business case for the solution. Many times these tools are specifically developed for the value proposition of the company's solutions. These tools let the sales professional collaborate with the IS executives to quickly evaluate and justify the expense. Research from Gartner and Meta Group indicate that IT solution providers that deliver a quantified ROI proposal are 60% more likely to get approved, and sales cycles can be reduced by as much as 30-40%. Assuming a best case scenario for a typical IT vendor with 100 sales professionals, average sales of $120,000 per deal, a gross profit margin of 30% and a current sales cycle of 8 months, a 30% reduction in sales cycle and a slight increase in sales effectiveness through the use of ROI selling solutions can – if adopted and credibly applied - yield returns greater than 1000% and millions of dollars in NPV savings.[30]

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[29] Meta Group, Dr. Howard Rubin, InformationWeek August 2001

[30] An online ROI analysis is available at http://www.alinean.com to calculate the cost-benefit of implementing an ROI sales force automation solution.

Effectively, this implies that performing an ROI analysis for a solution has its own quantifiable ROI. For IS executives, standard ROI frameworks and tools are becoming available to help manage the analysis of specific solutions, and to hopefully advance ROI to a complete investment portfolio management tool.

ROI as an Objective Project Selection Tool

"We don't use ROI as a method of justifying why we need to spend money. We use it as a method of knowing where to invest money to keep our company growing. If you want to be a mature technology organization, you need to know you're doing the right thing the right way" – Joe Siebert, CIO of Viacom

ROI analysis, although implemented to be an objective tool for validating and selecting projects, can often be maligned to forward an IT executive's or group's personal or political goals. As with any management tool, it can serve as a useful tool, or cause more harm than good.

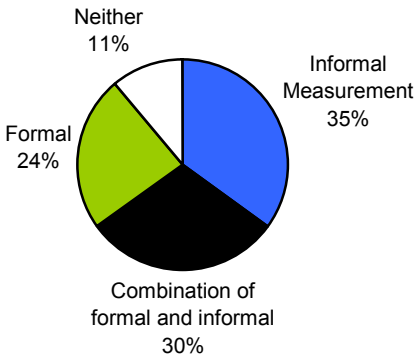

Figure 33: Only 24% of surveyed companies have implemented a formal system for measuring payback. ? - Information Week ROI Study of 200 IT professionals.

Understanding how the ROI analysis can be manipulated can help to avoid such issues. One of the most obvious issues is that one or more persons are responsible for researching and populating the model with cost and benefit metrics, and that such metrics can be under or overstated, or delayed or accelerated in time to affect the cost justification business case for the project.

To guard against this, the ROI analysis must be more than numbers on a page, in a tool, or in a spreadsheet. **The results of the ROI analysis must include notes on the underlying assumptions for the metrics**. Some questions that the report and notes should answer include:

- Is the source of the savings metrics a best guess by the project team, from an analyst group, from the vendor, from researching a test deployment, or from a combination of these sources?
- Do the metrics include actual salary data from HR, call metrics from the call center, headcount and time sheet information from accounting, sales metrics from finance, or were average research metrics used?
- Are specific sources of the information documented, and have the responsible team members "signed up" to support and be accountable for the provided values
- What composes the costs for planning or deployment, specifically, what resources are represented, by name, in the plan?
- When labor savings are presented, will the labor actually be saved through headcount reductions, or will the resources be reassigned?
- When productivity savings are presented, have they been discounted to account for the fact that not all productivity time will be used for bottom line corporate gains such as headcount reductions, or performing valuable work tasks?
- What are the risks, on a line item basis, towards the costs or benefits being as stated?
- Have the costs been increased, or savings decreased to account for risks?

- What if the costs double and the benefits are halved or quartered – does the project still make sense?
- What if the adoption or absorption rate is slower than expected and the benefits realization is delayed over time – do the benefits still yield enough return to justify the solution?
- If all of the soft benefits, or an entire category of savings, are removed from the analysis, does the business case still make sense?
- Are both tangible and intangible benefits represented and documented to provide a complete picture of not only the cost savings, but also the potential business advantage the project can generate?
- Are the intangible benefits documented beyond broad statements such as "the enterprise information portal will provide us with competitive information that will give us a competitive advantage?"

Case Study: Why is the ROI Dashboard valuable to IS Departments?

According to analysis from Gartner, Meta Group and other analyst firms, companies that implement measurement and alignment programs such as the ROI Dashboard model experience optimizations in spending of 20-40%. These gains occur by maximizing cost reduction programs and concentrating on fewer high value investments, with collateral gains in the ROI and net benefits to the organization. Information Systems managers will find that the application of the ROI Dashboard will help them to:

- *Align business goals with IS and technology goals*
- *Methodically and objectively select projects that maximize returns vs. expenses*
- *Manage costs and expectations*
- *Measure performance over the life of a portfolio of solutions*
- *Maximize the return on investments and the value of IT to the organization*
- *Provide facts for continuous improvement*

ROI and Risk Management

"Businesses often forget to consider the "what-if" scenarios when factoring ROI, and that's often where money is lost over the long haul" – Paul Strassmann, ex CIO of Xerox, author and ComputerWorld columnist

When a project's ROI is calculated, most of the traditional calculations do not take the risk of the project into account. Because project risk can increase costs of a project, or decrease or delay returns, it is indeed an important consideration in the analysis of a single project, and in the comparison of projects competing for scarce IT budgets.

ROI analysis can indeed incorporate risk, to make the analysis more realistic – calculating a **risk-adjusted ROI**. When costs such as planning and implementation are tallied, the calculations can include a "risk factor" which can be used to scale the costs higher to account for the chance that cost overruns will occur. A risky implementation that has many unknowns can scale the costs by a 20-50% risk factor, to be sure that even if the overruns occur, the project returns are high enough to compensate. As well, a project whose benefits are dependent on re-engineering various organizational processes or relies on changes in user behavior may have some additional risk. To accommodate for this risk in achieving the predicted benefits, the benefits of the project can either be scaled back in magnitude using a risk scalar, or the schedule for when the benefits occur can be delayed. When projects are compared to one another, the ROI analysis across the projects can accommodate risk in a similar fashion, although, because it is hidden within the calculations, it may be difficult to standardize across the project's being analyzed.

Our preferred method for handling risk is predicated on the fact that risk is so important in project selection, that it merits its own analysis subsection, and that risk not only effects the costs and

tangible benefits, but intangible benefits as well. Rather than using "risk adjusted ROI", risk should be analyzed and tallied for each project, and then used as a score as part of the project comparison,

Case Study: Risk and ROI

As an example, in a simple analysis, two projects have the following profiles and compare the tangible returns with risk:

	Project 1	**Project 2**
NPV Savings	$3,000,000	$25,000,000
ROI	311%	650%
IRR	252%	576%
Payback period	4 months	3 months
Risk	3/10	7/10

Project 1 produces modest returns on a relatively small investment and has low risk, while Project 2 produces great returns, but has high risk. Depending on the current business state, need for returns and risk tolerance, much like your personal investment criteria in the financial markets, the company can decide whether to go for the higher risk reward investment or play conservatively with the budget. Other factors will also be used in our project selection matrix, as we shall see in later chapters.

ROI and Vendor Credibility

"ROI has become a buzzword among technology vendors eager to prove their products and services are worthy of a chunk of IT budgets. But Nancy Tripp, VP of SunTrust Banks' solution center in Atlanta doesn't trust vendor provided ROI figures. "Vendors will put the most positive or most aggressive return rate associated with their software," she says. "But as the project manager, I put the most conservative return rate." – Mary Hayes, Information Week – Payback Time: Making Sure ROI Measures Up.

Advertisements from Oracle claim over $1 billion in savings from using its own solutions. Microsoft counters with 99.999% reliability billboards. CIOs and other IT executives are often wary of IT vendor ROI claims, often with good cause. Sales professionals bombard the executives with messages of big returns and substantial benefits. Often, the savings claims made in these errant sales pitches are more than what the executive spends on a specific area, or even more than their entire IT budget. Overzealous sales professionals have been known to misuse the ROI analysis and results, overstating claims, which cannot be achieved by the customer. These unmet expectations can cause a backlash against the analysis method used to arrive at the decision, against the sales professional, and also against the company.

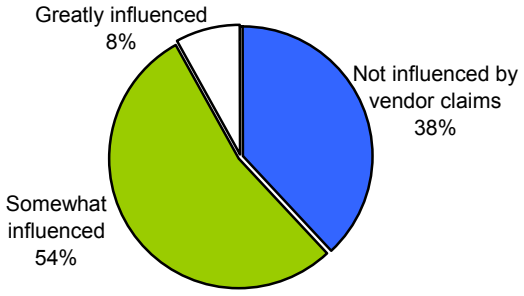

Figure 34: A survey on how vendor claims of ROI are perceived. - Information Week *ROI Study of 200 IT professionals.*

ROI is absolutely a selling requirement today, but how does an IT vendor establish an ROI marketing and selling program that has credibility, and will help, not hurt the vendor win customers and maintain loyalty? Here are a few helpful line items that any IT vendor ROI program should address:

1. **Establish a credible value proposition** – the most overlooked aspect of ROI programs is that to begin with, the company and its solution must have a compelling and clear value proposition. Many companies embark on creating an ROI program without first detailing the specific solution bundles available, the purchasing and implementation costs, derived benefits, and specific features which deliver the savings and business gains.

2. **Research the ROI claims** – once the business case model is developed, it should be populated with metrics that are researched wherever possible. In an ideal world, the costs, benefits and analysis are validated in a multi-client study, where tens to hundreds of clients are interviewed and analyzed. Often, the solution is so new and there are too few implementations such that there are no savings data available. Or there is neither budget nor time for doing a multi-client study. If this is the case, the vendor can work with one or more skilled analysts to populate the model with stalking horse data, derived from databases of benchmarks and the analyst's experience of interviewing and working with clients and solutions. If using stalking horse data, it is important to build a mechanism for refinement into the process, so the stalking horse metrics can be field validated and the refined over time, replacing the stalking horse estimates with actual survey data. In any case, all parties to the ROI analysis must be able to accept the stalking horse data as reasonable.

3. **Validate the ROI claims** – whether research or stalking horse population of the model has occurred, the claims should be validated with the company's IS department and professionals services group first, current customers second, and then prospects to see that it makes sense. Often, press releases fly and CDs are pressed before the claims are tested. It is important to implement a formal mechanism for review and feedback into any program.

4. **Develop an established ROI selling program** – With the model and metrics validated, a specific program of marketing messages, white papers, case studies, tools and personalized business case reports should be developed to formalize the program. Instead of ruining credibility with the prospect by stating wild personalized claims, use case studies rather than specifics in initial sales pitches. Use an online teaser ROI tool to gather specific project data so that customers can explore their own value proposition and so that sales professionals can use the supplied data in their early sales pitches. Implement personalized ROI evaluations as a value added part of later in the sales cycle, and implement a sales manager or ROI expert review of each cost-benefit proposal. All of these approaches need to be formalized and documented into a formal ROI selling strategy. This will help eliminate misuse of ROI messages and the setting of unrealistic expectations by the sales force, and lend credibility to the program.

5. **Train the sales force** – with an established ROI program, and armed with marketing and sales tools, the sales force needs to be trained on their application of ROI into the sales process. Many do not know how to sell to executives and the economic buyer, yet they need to be in order for your company to succeed. The training should provide a step-by-step guide on how to apply the ROI selling program, and provide enough background about ROI and the financial aspects so that the sales professionals are comfortable dealing with questions, and are empowered to deal with objections. As well, an ROI tiger team can be used to help support the sales professionals when developing and presenting the ROI reports.

6. **Support the sales force** –often, ROI programs are deployed to the sales force, and support has not been contemplated. The ROI program will generate specific questions from prospects and their sales professionals that will need to be addressed by ROI experts in order to win the deals. An ROI resource center with frequently asked questions, white papers and case studies can help. As well, live support for developing and refining the cost-justification business cases is essential, and should be budgeted as part of the program. This support should not only support the field on specific deals, but be tasked with assuring that the ROI messages, marketing and selling tools

evolve over time to address common questions and refine metrics. Some very successful programs have included tiger teams of in-house and consulting ROI experts who worked with regional sales professionals and the prospects in developing business cases and evolving the programs over time.

7. **Track the ROI over time** – most IT vendor's commitment to ROI ends with a signed deal. However, it should continue well into implementation and deployment to assure that the proposed value was indeed derived from the solution. Too often, the lack of planning to measure ROI results prevents customers from realizing the potential gains of the solution. With an ROI support program in place, professional services can implement a program to measure the ROI over time, and work to assure that the proposed value is delivered. In many cases this requires that the solution itself be designed to capture the key metrics assumed in the ROI analysis.

It is of paramount importance that all parties examine and eventually agree to the assumptions built into any ROI analysis. While there is value alone in exploring these assumptions, survival in front of any procurement committee (up to the Board of Directors) depends on defending these assumptions.

Perhaps it is stated best by Garrett Grainger, the CIO of Dixon Ticonderoga, a manufacturer of pencils and other writing instruments, in a recent interview for Information Week, where he states: "I don't have the staff or resources to do a full ROI." So he treats ROI much like a request for proposal, as he states, "If you take three vendors and allow them to do an ROI for a particular project, you have the basis for evaluation." The most credible business case will win, making ROI an essential element for the IT vendor.

The New ROI Dashboard

With each of these issues in mind, we will mold traditional ROI analysis into a new model: One that incorporates intangible benefits and risks into more comprehensive measures of value from IT. One that is easy to use and can be credibly applied by vendors.

The ROI Dashboard is different from the traditional ROI model in that it seeks to incorporate other measures into the analysis that are just as important to selecting the solution as the *net tangible benefits* and financial gains. Metrics such as *risk of the project* are used to assure that the financial returns are adjusted to account for returns that may not be easily realized. Other metrics such as *intangible benefits* are used to assure that projects are not just selected to cut costs but to actually grow the business, improve competitive advantage, increase customer satisfaction, increase organizational capability and improve shareholder value and return. Therefore, the new ROI Dashboard moves from a one dimensional traditional analysis using net tangible benefits, as described prior, to measuring solutions on three dimensions: Net Tangible Benefits, Intangible Benefits and Risk.

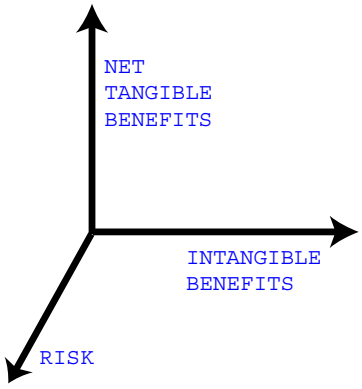

Figure 35: The new ROI Dashboard measures solutions on 3 dimensions: Net Tangible Benefits, Intangible Benefits & Risk.

The modern ROI Dashboard seeks to create an **ROI Dashboard™** for measuring and evaluating a project portfolio, where the three metrics of net tangible benefit, intangible benefit and risk are compared for several projects to select the best of breed solutions.

It is important in the ROI Dashboard to divide the analysis among two sets of projects, those projects essential for running the business, the **infrastructure projects**, where cost savings and the tangible benefits play a greater role, and those used to gain **business advantage,** where intangible benefits may hold greater weight.[31] With current conditions demanding cost saving measures, tangible benefits are often given more weight in the analysis. When this occurs, projects with the highest calculated ROI values are selected as the projects that need to be implemented. Potentially, this can lead a company into missing a key innovation or new business opportunity in its zeal to cut costs. In the new world of the ROI Dashboard, by dividing the portfolio into these separate business initiatives of infrastructure versus business advantage, the projects within the two classes can be evaluated effectively head to head, giving weight to the tangible benefits, intangible benefits or risk of the infrastructure projects and other projects as appropriate for the company and its current situation. Then, wherever the projects fall across these buckets, they can be compared so that even though the company may be concentrating on cost savings, some weight may be given to IT projects which promise business advantages, and vice-versa. As the economic pendulum swings from fiscal restraint to growth fervor, the portfolio can be appropriately balanced.

The ROI Dashboard and Lifecycle Management

"According to experts, one huge problem with the way that most companies use ROI is that a savings or revenue stream is projected, the project gets approved and completed based on that projection and then nobody goes back to see if the projection actually came true." - Johanna Ambrosio, ComputerWorld

The ROI Dashboard describes ways that IS organizations and IT vendors not only use ROI as a quantified and objective selection or selling tool for projects, but as an ongoing management tool, measuring and tracking the ROI of the project over its useful life. Using ROI as a management tool, management can be assured that projects actually deliver on the returns, or additional focused action can be taken to address projects that are not delivering. An ROI Dashboard can be used as a framework for collecting, analyzing and comparing ROI as each project is implemented and deployed. The system can use data from project management systems and accounting to automate the tracking of projects. The entire portfolio can be tracked to compare returns for the entire IS project portfolio. ***Unfortunately only 25% of corporations use ROI as a formal selection tool, and less than 12% of the IS organizations use ROI beyond a tool to select specific solutions. It is no wonder that the correlation between IT investments and derived value is so low.***

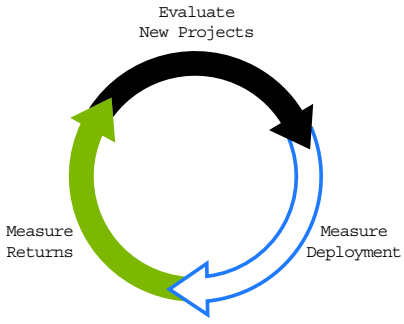

Figure 36: To match product and project lifecycles, the ROI Dashboard model is applied in a continuous improvement cycle to evaluate new projects, measure deployment and validate returns.

[31] The concept of dividing the portfolio into separate analysis buckets based on the type of project and impact it has on the business was put forth in an article by Dr. Howard Rubin, Doing the ROIght Stuff, August 6, 2001, Information Week.

The ROI Dashboard and Risk

"You might choose to accept greater risk of failure because there's greater reward," says Frank Prince, an analyst at Forrester Research Inc. in Cambridge, Mass.

"What a lot of people don't do is really plan for the inevitable failure and really take steps in understanding what it's going to take to recover from failure," states Dennis Gaughan, an analyst at AMR Research Inc. in Boston in an interview with ComputerWorld

We all deal with risk in our personal investments, and know, that often to receive higher returns, we often have to increase the risks that we take. Each person has a particular tolerance for risk, and the goal is to find a risk/return ratio that an investor is comfortable with, and regardless, to minimize the risk while maximizing the return. As well, in a given portfolio, it is important to have a mix of investments – some with more risk and higher returns, others more conservative.

IT investments are similar, where there is a certain cost requirement, projected returns and risk profile for each investment. As well, like individuals, each company and IT department has a given risk/reward profile based on their business, the marketplace, culture, time horizon, goals and current situation. However, many do not consider risk as part of their decision-making and ROI analysis process. Risk is important because even though a particular project may promise to deliver high returns, the company may be in a financial position where it is being conservative in its tolerance for risk, or the risks may be so high that the project's returns should be discounted, or the project discarded from consideration.

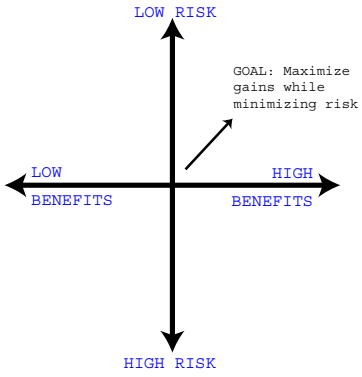

Figure 37: Risk Analysis

Risk analysis should be a process and procedure for documenting the foreseeable issues that may occur. Risk analysis should involve measuring the possible impacts, and mitigating the likelihood that the risks will occur. Risks can lead to longer than expected deployment schedules, higher than expected costs or less than expected benefits, which can quickly turn a business case from positive to negative. Many times, especially with large projects such as CRM, ERP and supply chain automation, the organization fails to recognize key risks, such as hidden project costs, training, user acceptance and deployment delays, leading to more failures than successes.

So how can risk be measured and managed? First, the team should meet to discuss the possible risks, and these should be documented to include a description of the risk, a probability of occurrence, a severity level (the possible impacts), an assigned resource, and a mitigation strategy for each listed item. Initially, the risk documentation should be general and broad, and progress to more specific items as the ROI analysis continues. The mitigation strategy may be active, such as requiring more guarantees from a vendor, or it may be passive, such as reducing the assumed rate of benefit realization or increasing a contingency cost factor.

Case Study: Risk Analysis

A documentation of an initial risk matrix for the implementation of a sales force automation software solution from a start-up software vendor may read:

Risk	Description	Probability	Severity Level (potential Impact)	Assigned	Mitigation Strategy
The IT vendor is a start-up company	Start-up company's solutions may not be available in the future, along with required maintenance and support	25%	8 – may require shifting to another solution midstream, and occurring re-purchase and implementation costs again.	Bill Smith	Obtain and monitor the D&B rating on the IT vendor, place source code in escrow in order to obtain if company should become insolvent.
User Acceptance	Users may not use the software as expected, not taking advantage of the features that are being relied upon to deliver the benefits in the business case.	35%	6 – the projected benefits may not be realized to predicted levels, or may be realized later than anticipated.	Deborah Jones	Require software training so that each user knows how to use the software. Communicate with users so that they understand the value of the solution and why it should be used. Train support teams, and field support to readily answer questions and issues. Base a portion of compensation on using the system.
IT resources	IT resources may not be available to implement the project until another project is completed	45%	4 – key portions of the implementation project may be delayed causing implementation delays and cost overruns.	Mark Jones	The delay in IT resources could delay the implementation and time to possible payback.
Compatibility	The software may not be compatible with all applications and systems.	48%	4 – workarounds may have to be implemented, or un-expected system upgrades may need to occur leading to extra costs.	Mark Jones	Obtain test list from the vendor on compatibility testing and OS/application certifications. Test the application with standard user configurations prior to deployment. Assure that any incompatibilities are documented and mitigated.

Risks may include items such as:

Labor Resources – Perhaps the hardest to control, labor resource risks are the most likely to occur, and can have the biggest impact on costs and benefits. Labor resource issues can include:

- The assigned resources may be assigned to another project, and that project may not be completed in time
- The skill set to implement the project may not be available in the given organization, meaning that training needs to occur, resources need to be hired, or key portions of the project need to be outsourced to skilled resources
- The knowledge to implement the program relies on one or a small group of key resources who need to be retained in order for the project to be implemented successfully

User Acceptance – users may not accept the solution and rebel, or more likely, they will not adopt all or some of the key features, which reduces the benefits substantially.

Compatibility – the solution may not be compatible with current or future operating systems, platforms or other applications.

Vendor – the vendor may not be able to deliver the solution in the promised time frame or to the required specifications. The vendor may be a start-up, or not financially sound, so they may not be around in several years to support the solution and deliver required updates and upgrades.

Management Commitment and Funding – the senior management and the stakeholders may not be fully committed to the project with management support, and especially funding.

Market or Strategic – the market may shift, competitors may change their strategy, or the company may change strategic direction, changing the project requirements, or changing the business benefits equation.

Schedule – the project requirements may drive a schedule that is unrealistic. The overruns in schedule may cause cost overruns, delays to benefits, and impacts to other dependent projects.

Legal and Governance – there may be legal and governance risks and exposures in the project, such as not being able to implement the project in time to meet legal regulations, or a failure that may risk legal exposure. The project or issues with the project may also effect compliance with governance issues such as financial reporting requirements.

Organization – there may be risks to the organization as a whole, such as a risk involving employee morale or organizational dynamics should issues occur.

Dependencies – there may be risks that can affect a family of dependent projects, such as delays, resources or budgets

More often than not, three project factors can be altered to help mitigate risks: Resources, Features, and Schedule. Increasing resources usually increases costs, reducing features often reduces benefits, and lengthening schedules can increase costs or reduce benefits. The trade-off balance and management of Resources, Features and Schedules is vital to containing expected costs, achieving predicted benefits and eliminating risk.

As with ROI, it is important to treat risk as a management process, using it not just as a pre-project evaluation tool, but as an ongoing management tool to assure that the risks identified at the planning stage are mitigated during implementation and deployment. Risks that are understood and steps taken to mitigate such risks will help assure that costs are controlled, and benefits are delivered, increasing the odds that the expected project returns will be realized.

In our ROI Dashboard model, risk is compared directly with the tangible and intangible benefits to create an overall three-dimensional "score" for the project. The score can be used to determine if the individual project is worthy of consideration, or can be used to compare against all projects to determine whether the portfolio is delivering the desired mix of costs, tangible benefits, intangible benefits and risk.

To plot risk along with the tangible and intangible benefits will require that the risk for the project be given a relative score, from 1, the lowest risk, to 10, the highest risk. Since each risk item in the risk analysis has a probability and a severity, the assessment of risk should be easy, by factoring each of the probabilities verses severities, and developing an average score.

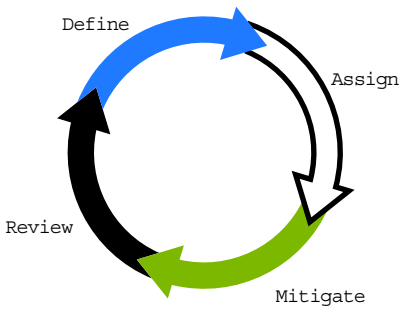

Figure 38: Risk should be managed continuously

The risk can be compared against the tangible and intangible benefits to determine if the project is worthwhile, i.e. the benefits outweigh the risks by substantial enough margins to proceed, or the project can be compared against the portfolio of current and candidate projects.

The ROI Dashboard and Intangible Benefits

"If information technology is used with a clear business goal in mind, projects show a significantly higher success rate compared with investments with a purely technological background." -- Jurgen Ringbeck, McKinsey & Co.

"Theoretically, the value of a company is the sum total of all the assets it carries on its books. So why is the total stock value of some companies -- especially technology firms -- as much as 50 or 100 times greater? "That difference must be related to intangible assets" - David Larcker, professor of accounting at The Wharton School, the University of Pennsylvania's business school.

As indicated, ROI analysis sometimes comes under scrutiny because, although it serves to quantify and compare costs and benefits, often, some key reasons for implementing a project cannot be readily quantified. For example, it may be very difficult to justify a corporate Internet site just on the basis of reduced printings and mailings of corporate brochures. Yet the corporate Internet serves a vital strategic marketing and branding purpose, and without a proper site, the company will lose perceived strength with customers and investors. Therefore, project selections based purely on an ROI analysis that only considers tangible financial benefits, may indeed lead to the rejection of valuable and vital projects – those with significant intangible benefits.

The label intangible benefits sometimes causes issues, as all benefits of a project are indeed tangible, however some are harder to quantify on a project by project basis than others. The more difficult to quantify benefits, we group under the label intangible benefits. Although difficult to measure on a micro-economic basis, the intangible benefits should be readily apparent on a macro-economic basis – providing an increase in EVA, Information Productivity or Market Capitalization.

Some intangible benefits that should be considered when evaluating and measuring the performance of a project include:

- **Brand Advantage** – It may be difficult for direct sales increases to be tied to the proposed project, but many new products - or marketing and advertising related projects - can lead to an increase in the perceived value of the corporate brand. As perhaps the clearest an example of the intangible benefits of brand oriented projects, many automotive brands maintain expensive race programs to promote their brands. Of course there are tangible benefits that result from the R&D investment in these race programs, but the billions spent on building and campaigning factory race teams is mostly a brand building exercise. For IT projects, some may be implemented primarily to promote the company's brand image in the marketplace. If the corporation's brand is perceived as stable, there may be significant intangible value investing in a disaster contingency facility and promoting this fact to the marketplace. If the brand is consumer oriented, there may be valuable brand equity from implementing a content rich,

multi-media web site that includes free games and promotions. If the brand is innovative, there is intangible value to the brand in launching a wireless access solution, such as wireless trading for a broker or high net worth customers. If the brand is employee friendly, it may be wise to invest in aggressive training and certification programs to reinforce the brand image. Whenever a project is considered, consideration should be given to the intangible benefits of helping to promote the company's brand image with the project. For IS department personnel, it will be wise to involve the corporate marketing and branding team to evaluate this category.

- **Strategic Advantage** – Certain projects are implemented because they are highly important to an intended corporate objective. The company should have a set of written goals and the IT projects should align and support these goals. Using techniques such as the Harvard Balanced Scorecard can help drive the alignment of projects to the strategic objectives of the company. Projects, which help meet stated strategic objectives, or help align IT with the corporate objectives, can deliver the intangible benefit of strategic advantage. This is a very broad category and may include initiatives to help the company with mergers and acquisitions, legal and governance, visibility in expenses and forecasting, reporting, quality management, project management and growth. Several solutions that can aid in realization of strategic advantage include ERP systems, supply chain management, enterprise information systems, sales force automation, balanced scorecard, intellectual property asset management, computer aided design, quality management, management training, and project management.
- **Competitive Advantage** – Being able to release solutions faster, develop solutions less expensively, better address customer needs, meet changing market demand, scale easily and more cost effectively, and gain market share are all hallmarks of competitive advantage. Some of these competitive advantages can be quantified as tangible benefits, while others might be difficult to put specific revenue and profit figures on. A few solutions which deliver competitive advantage can include computer aided design, supply chain management, collaboration and project management tools, public relations, marketing and advertising performance tracking tools, online marketplaces, customer relationship management and sales force automation.
- **Intellectual Capital** – Intellectual capital is the increase in relevant knowledge gained by the staff, and the perceived market value from those gains. This increased knowledge may indeed result in productivity gains or additional revenue, but is often difficult to quantify. As a result, improvements in the company's knowledge base and better management and sharing of intellectual capital are considered an intangible benefit. Projects that drive intellectual property gains include business intelligence, data warehousing and mining, enterprise information portals, data visualization, on-line collaboration tools and competitive intelligence automation.
- **Organizational Advantage** – enabling an organization to function more effectively can help to reduce costs and improve performance. Some of the initiatives can be quantified as operational savings or productivity improvements, while others, such as scalability of the organization, morale, creativity, improved communications, maturity and more effective collaboration may be difficult to place a dollar return upon. The intangible organizational advantages can be obtained from e-mail, instant messaging, wireless communications, mobile computing, knowledge management, data warehousing and mining, enterprise information portals, collaboration tools, human relations software, training and coaching.
- **Risk Avoidance** – One of the most overlooked intangible benefits is the risk of NOT implementing the solution. What if a competitor implements the solution and you do not – are there risks that the move could place your company in jeopardy of losing a cost, customer, marketplace or strategic advantage. Risk avoidance can include implementing a solution to avoid the risk of losses in market share, loss of key customers, employee loyalty, investor confidence and other important, but somewhat intangible risks. Samplings of projects that may deliver intangible risk benefits include more scalable computer systems (simplification), backup systems (reduce risk of data loss), security (reduce the risk of external and internal threats), mobile applications (competitive positioning), e-commerce (market opportunity) and corporate Internet solutions (meeting customer and investor expectations).

As discussed earlier, ROI analysis should include the comparison of three important measures: the intangible benefits, tangible benefits and risk. To measure the intangibles and include them in the ROI analysis, requires that each of these intangible categories be scored, and that an average score be calculated.

In managing a portfolio of projects, it is recommended that a standard be developed for the scoring. A higher score will mean that the intangible benefits are great, while a low score means that there are little intangible returns that are gained by the solution. Some infrastructure projects, such as network management systems are unlikely to provide intangible benefits, but deliver significant tangible savings such as reduced IT management labor costs and decreased user downtime. Some solutions on the other hand, such as business intelligence or customer relationship management, deliver significant intangible benefits, which often outweigh the modest tangible benefits.

Case Study: Intangible Benefits Analysis

The following is an example of how an intangible benefit analysis might be tallied for a PDA based wireless trading application

Intangible Benefits	**Description**	**Qualitative Benefit** (1=lowest, 10=highest
Brand Advantage	The wireless PDA computing project delivers a public relations opportunity that will help convey our brand image as a leading service provider	8
Strategic Advantage	With the PDAs, our customers and brokers are always connected, delivering better service than the competition, and better connectivity and information to our brokers	5
Competitive Advantage	The competition has not invested yet in secure PDA access to customer accounts. Our deployment of these innovative features will help to deliver a competitive marketing advantage.	5
Intellectual Capital	Brokers will have access to individual and group accounts, research, and market information and news anytime and anywhere.	7
Organizational Advantage	The organization can message and collaborate using the PDAs, providing a faster responsiveness throughout the organization	8
Risk Avoidance	Because we are first with this service, we could afford to wait, so risk avoidance is not a large issue	1

Section IV: Selling with ROI

Benefits of ROI to IT Solution Providers

"As IT budgets tighten, it becomes imperative that IT solution providers speak clearly and effectively to the prospect's economic buyer, creating a positive business case that will increase selling effectiveness and reduce lengthening sales cycles." - IDC, 2001

ROI analysis is in vogue once again for IT solution providers. Many are making ROI an integral part of the sales cycle. Sales professionals are being armed with the training and tools they need to help clients develop business cases. With these tools, the prospect can easily, in hours rather than months, generate the financial analysis needed to confidently sell the project to the economic buyer and win EVP, CIO, CFO and CEO approval. Historical studies have shown that financially justified projects are 60% more likely to be approved (Gartner). Additional studies show that the sales cycle can be reduced up to 30-40% in some cases (Gartner and IDC).

However, due to the IT spending euphoria of the past five years, most IT solution providers and their sales staff are not prepared to meet the tightened scrutiny of the economic buyer. And most IT professionals, raised on the spending euphoria of the Internet Bubble, are ill prepared to handle the financial scrutiny and planning necessary to gain approval for needed programs in a timely manner.

Clearly a dangerous gap exists between the demands of CIOs and CFOs, and the capability of most IT solution providers to address their purchase decision requirements. IT solution providers are scrambling to educate their sales forces on how to handle ROI selling, and arm the sales force with the tools needed to sell effectively.

Why is ROI valuable?

"To survive, IT executives will have to concentrate on getting costs, reliability and quality engineered to perfection. It's back to basics for a while, which means squeezing every penny out of ongoing operations." – Paul Strassmann, ComputerWorld

The survivors of prior boom-bust cycles were the companies that shifted their messages away from innovation as quickly as possible and focused on bottom line benefits.[32] Many of these companies,

[32] While the marketing and selling messages changed, it should be noted that the successful companies were those that were also able to recognize the next wave and invest early in its rise. When the distributed computing investment wave was complete, it was replaced a mere three years later with the meteoric rise in the Internet. Those companies that recognized this monster on the horizon and paddled towards it were handily rewarded. Dell as an example, invested early and heavily in e-business, enabling online procurement and management of their systems. A combination of focusing on the value proposition during the downturn, and investing in a competitive advantage with e-business, led to their rise from obscurity to dominant position in the corporate PC marketplace.

as is the case today, needed to re-tool their marketing messages and sales forces to communicate a new value proposition to prospects who no longer cared about what mattered most, just a few months prior. The best IT solution providers quickly concentrated internal efforts and hired experts to help them understand and build effective ROI business cases. As a first step, companies developed white papers and case studies to walk clients through the basics. The best companies provided tools to help users quickly calculate their personal return on investment and automate the development of the business case.

Leading Technology Solution providers have discovered that selling using quantified costs, savings, TCO and ROI drives their own success and enables them to:

- Empower sales professional to sell effectively to the economic buyer
- Reduce the time to build effective business cases from months to hours
- Obtain alignment between technical and economic buyers
- Reduce sales cycles by as much as 30-40%
- Improve project results and satisfaction
- Differentiate the offerings from the competition

Assuring ROI through Service Level Agreements

"The whole investment equation has turned upside down. The climate has caused people to have a culture of ROI. There is not a company out there that is not struggling with this issue." - Primary Knowledge CEO Peters Adams, Demand For ROI Heats Up By David Lewis, CMP

A service level agreement is a written guarantee by a vendor that they will meet certain minimum operating requirements, or be expected to compensate for the failure to deliver as promised. Increasingly, IS Departments will demand, and Technology Solution providers will be required to provide Service Level guarantees of all kinds in order to initiate projects.

Generally, it is common to have service level agreements that relate to expected availability and responsiveness, but far less common are service level agreements that relate to ROI. What if a vendor could be engaged enough in your personal ROI analysis and were willing to stand behind the results? This may be radical thinking for many, but this type of partnership could benefit IT departments, business groups and solution providers alike and will eventually become a reality in business.

The service level agreement of the future will involve the IT vendor helping the client to understand the ROI analysis, and promise the delivery of key benefits. If the benefits are not delivered to some minimum level, the vendor would have a means to help remedy the situation. If they still failed to deliver, penalties may apply. As well, if the benefits are higher than the maximum expected, the IT vendor should be rewarded with additional compensation and/or substantial intangible benefits such as public testimonials, reference credentials or future contract extensions. This type of approach would:

- Allow company's to have more confidence that the IT projects they implement will actually deliver tangible gains
- Allow IT solution providers to truly partner with their customers, taking a vested positive interest in their success
- Require that all of the parties involved understand the proposed costs, benefits and ROI and commit to their accuracy
- Require that the costs and benefits be tracked and shared collaboratively, allowing the IT vendor to help if costs are higher than expected, or benefits are lower than anticipated
- Allow both the company and the IT vendor to share in the success of the solution, with both sharing in the rewards.

For IT managers, many would appreciate an IT vendor who has more of a stake in the project's success, and who will be involved in the planning, implementation and management phases of the solution to assure that it is delivering as promised. However, few business unit managers would want to pay more to the vendor if the project exceeds expectations, though there are many suggested forms of compensation beyond direct payment. Companies that indicate that they would like a partnership with a vendor, must be willing to step up to the plate with increased rewards to a solution providers that truly deliver.

For the IT vendor, implementing service level agreements is always a difficult proposition because it introduces an unknown impact to planned revenues, requires that the IT vendor rely on the corporation to successfully implement and adopt the solution as predicted, and can greatly increase the IT vendor's expenses if more investment is needed to meet the promised service levels. But, service level agreements could greatly decrease the sales cycle, reducing the doubts a company may have in implementing a solution. As well, if the company agrees to share in the benefits if the project exceeds expectations, the company can increase its revenue significantly if the solution indeed outperforms.

Moving to an ROI service level agreement would indeed be a radical approach for IT solution providers and managers alike, however, with the recent return to fiscal scrutiny, now is the time to begin the move to shared risk and reward in major IT projects. Realistically however, it is predicted that today's status quos will remain most common: IT solution providers will not move to such a risky and non-visible business model of shared benefits. For those that are willing however, corporations will need to find direct or indirect ways to share the wealth on successful projects.

Selling using ROI

"With signs that IT spending is starting to slow as corporations tighten their belts, organizations can no longer put large amounts of money into IT budgets without knowing their ROI" - Julie Lavalee, Software Magazine

ROI analysis can be a valuable sales tool for IT solution providers, even if they don't go to the extreme of using ROI in Service Level Agreements. As we discussed in the introduction, with renewed scrutiny on IT spending, projects that cannot document a benefit -whether tangible or not - will not be considered. It is essential therefore, in this fiscal environment, that the savvy IT vendor implements a formal ROI selling program. However, because the discipline of ROI selling fell from favor, many IT solution providers, their sales professionals and channels are not ready to prove the tangible value of their solutions with clients.

ROI selling involves a programmed method allowing prospective clients to, in sequential order:

1. Clearly understand the value proposition of the solution
2. Validate these benefits through third party sources and client case studies
3. Calculate their personal ROI including all costs, tangible and intangible benefits and risk
4. Easily document the results and run "what-if" scenarios with business groups and financial analysts to help gain internal buy-in to the business case
5. Help manage the costs during implementation and assure realized benefits once deployed

Case Study: Steps to Implementing a Successful ROI Selling Solution

Many in management believe ROI holds the key to solving the company's sales woes; while others are skeptical it will have any impact at all. The truth of course is that it won't solve all of the company's problems, but there is no denying that it is indeed a requirement for selling in today's marketplace. And a prepared sales force will have more success and competitive advantage than one that is not armed with the right tools to over come objections, present competitive advantage and close the deals.

So it all sounds promising, but exactly what are the steps to develop and implement a successful ROI selling solution?

Step 1: Awareness *- Does the company believe that they need an ROI program to be successful? The need has to be understood before the team can generate enough interest to complete the program and reap the rewards. Executives, business managers and sales executives need to understand what ROI analysis is, what the elements of a successful ROI model and selling program are, and why it is valuable in helping to increase sales efficiency and effectiveness, especially in these tough economic times. The team especially needs to have a commitment to the program, including executive buy-in. Often, it is helpful to create a nexus of ROI champions and expertise to carry the torch, convey the message and to work through the rest of the project steps.*

Step 2: Assumptions *- Does the company know what the value proposition is and what specific cost and savings elements need to be provided to create a compelling business case? You would be surprised how many companies want to implement an ROI program, but have not thought through what the solution components are and what the total value proposition is. Other companies have done a great job with identifying the features and benefits that the solution provides but have not quantified the ROI. In brainstorming sessions, which may be facilitated by analysts and consultants, the assumed value proposition should be researched and documented. The product managers, systems engineers, marketing managers and sales professionals need to work together create a consensus framework of all of the costs and assumed benefits that can be derived from the solutions. The result should be a cost, benefit and analysis model that can be used as a framework for calculating the ROI. The model may have some assumptions for costs and savings that now need to be validated with existing clients and field-tested.*

Step 3: Research *– Is the assumed value proposition being realized with clients? The model and assumptions should be tested with the internal IT organization, existing clients and analysts. In this manner, the assumed costs, value proposition and ROI assumptions can be verified, and the company can be sure that the model makes sense and is usable by sales professionals and prospective clients.*

Step 4: Education *– How can the business case be communicated to clients? The value proposition and research should be documented in white papers and case studies for communication to the sales force, channel and prospects. An online resource center may be created as a central repository for sales and IT professionals to gain valuable knowledge about the business case. Seminars can be conducted to provide the valuable information to prospects. And sales professionals who may not have ever used ROI selling should be trained on what ROI is, how it can be best used in the sales process, and how to work hand in hand with clients to build cost justification business cases. ROI experts may be selected to work with the sales professionals in developing business case proposals, and presenting and defending results.*

Step 5: Automation *– Can the results be generated automatically? The calculation of the ROI analysis can be automated in an ROI tool, enabling sales professionals, channel partners and prospects to quickly and easily calculate the required ROI financials and develop a complete business case. The tool is often seen as the ROI program itself, but it is only a method to automate the cost-benefit model, more effectively communicate the value proposition research, and generate slick results. It is important that all prior steps be conducted as part of the ROI program to assure success, particularly management support, collaborative development of the model, research and communication.*

Step 6: Measurement *– The most neglected question in current ROI selling programs is: "Did the projects achieve desired goals"? It is important to learn whether the completed projects are indeed deriving the anticipated results for the clients. Are the costs over or under budget? Are the savings being realized, or have implementation, training or adoption issues prevented expected gains? By studying implementations, the team can assure that clients are indeed deriving the full benefit from*

the solution. The ROI program is utilized as a lifecycle management program to drive continuous improvements and increase the long-term success of the client relationship.

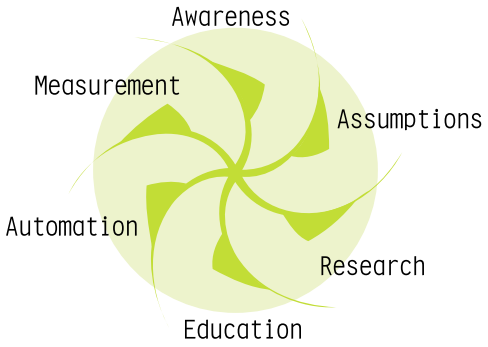

Figure 39: Implementing ROI Selling is a continuous lifecycle management process

To accomplish the goals, the IT vendor needs to dedicate resources to ROI selling. These can involve creating an ROI specialist within the marketing or project management team, as well as engaging third party ROI Experts and Analysts to develop the program. Elements of the program should include:

- An ROI white paper that thoroughly outlines the general value proposition that most clients will realize. This white paper should include third party analysis and studies to validate the assumptions.
- Case studies that quantify specific projects and ROI of current clients, with quotes from the client and or third parties to validate the results. The case studies should be selected so that they most closely relate to the actual prospects and cover enough vertical markets and sales regions, so that clients can see themselves in the case studies
- An ROI analysis worksheet or tool to allow prospective clients to quickly and effectively understand, research and calculate their own ROI. The tool should include defaults to allow for quick analysis, the ability to quickly and easily run "what-if" scenarios and generate an ROI analysis report for review and approval by the economic buyers within the organization
- An ROI training program that will teach sales professionals about ROI, why it is important to clients, and how to use the ROI marketing and sales tools effectively with clients
- ROI Seminars and online resource centers that help communicate the ROI message to prospective clients, and promote the company as an ROI partner; one who cares that their solutions will deliver tangible benefits to the client

Case Study: ROI Selling Tools

ROI selling tools can be developed for IT solution providers and sales professionals to enable more effective selling and help to reduce the sales cycle. ROI selling tools can be as simple as an excel worksheet and as complex as an interactive online program to calculate and track ROI. To be effective, the tools need to have some basics covered:

1. *The ROI tools help the sales and IT professional organize the project's costs. Often overlooked, it can be difficult to understand everything that is involved in planning, purchasing and deploying a solution. The tool can help create a dialogue where expectations are set as to the true cost of the solution. By providing a "cost configurator" and key deployment metrics such as minimum system requirements and person hour estimates, the costs can be quickly tallied.*
2. *The ROI tools can automate the conveyance and calculation of key benefits such as labor savings, operational savings, productivity improvements and valuable business benefits. The*

most difficult part of the savings and benefits are creating a framework to quantify the benefits, using metrics that are understandable and can be replaced with easily researched actual data from the client organization.

3. *By presenting calculated defaults for both costs and benefits, personalized for the global location and industry, and providing documentation so that the user can research their own personal scenario, the tool can help speed the research and derivation of savings. What could take days to research, now can take minutes with the automated tool.*
4. *The tool provides for a consistent and automated method for the financial metric calculations of ROI, IRR, NPV and payback periods. Properly accounting for the costs and benefits, and deriving the comparison automatically saves valuable time. As well, intangible benefits can be added to the project evaluation and scoring system.*
5. *Finally, the tool can automatically generate a report documenting the costs, benefits and ROI analysis, perhaps even exporting the results into a word processor for further refinement and customization. The project evaluation team, to assure that each project is researched and reviewed, then uses this report.*

So what is the business case for implementing ROI Tools themselves? As an IT vendor, does the cost of developing an automated tool justify the benefits? For a typical IT vendor with 100 sales professionals, average sales of $120,000 per deal, total annual sales of $120 million, a gross profit margin of 30% and a current sales cycle of 12 months:

- Typical costs for implementing an ROI solution can vary, but an IT vendor can expect to pay anywhere from $60,000 to several hundred thousand for a program. For this analysis, and for most IT solution providers, a typical program will require an initial investment of $150,000 including internal resources to manage, deploy and support the program.
- From deploying the tool, it is typical to expect an average 30% reduction in sales cycle, reducing the sales cycle to just less than 9 months
- The reduced sales cycle can generate an additional $36M in annual revenue, and $10.8M in profit
- If one in three sales professionals closes one extra deal a year as a result of using the ROI the sales tool, much less than the 60% increase in proposal approval predicted by Gartner, an additional $3.6M in annual revenue, and $1.1M in profit can be generated
- Figuring a 50% risk into the benefit equation, that is, reducing the realized benefits by 50%, the ROI is still incredibly impressive, with a payback in only 2 months, an ROI and IRR of over 1,000%, and NPV savings of over $15M over a three-year analysis period.[33]

Case Study: Success Factors in an ROI Selling Program for IT Solution providers

Another question that is often poised is: Are there many hidden costs in an ROI selling program? The IT vendor who wants to effectively implement an ROI selling solution should make a commitment to training and supporting the field staff. Analyzing over 50 ROI selling programs that we personally implemented, the big differentiators in the success of ROI selling programs were:

- *The creation of an ROI resource center that included training, support and experts to help the field professionals use the tools, interact effectively with IS executives and present the results.*
- *Assuring that the tool evolved from its initial release to include changes identified by the ROI program team and sales professionals. This included changes to the model and metrics. A proper maintenance program refines the tool over time and makes it more effective.*

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[33] Some of these ROI selling benefits need to be discounted because the ROI program won't be immediately adopted and used effectively by the entire sales force, however, even a very lengthy and low adoption does not reduce the payback to be more than 6 months from initial deployment, with returns of 500% or more.

- *Developing initially, and validating, that the tool results are credible. Are the model and the metrics realistic? Have the costs and benefits been validated by a third party? Are the sales professionals credible in their presentation and personalization of the costs and benefits or are they overstating possible results?*

Making sure all three of these factors are covered will assure that customers will adopt the results, rather than recreate them on their own.

Conclusion

The spoils of the new war will go to those solution providers who recognize the new battlefield sooner, and have armed themselves and their minions with superior tools. With planned budget constraints and the value of IT in question, solution providers must step up and recognize that their world has fundamentally changed. Three fundamental tenants mark the new battlefield:

- **Availability** – marketing, selling and delivering services with new levels of reliability, helping corporations reach their mission critical up-time goals
- **Security** – marketing, selling and delivering services with superior security
- **Accountability** – helping IT executives understand the value of their IT investments, and return on investment from each project and initiative.

Concentrating on the third law, solution providers can use the ROI Dashboard model and methodology to help corporations understand the returns from individual projects and the overall return from the portfolio of solutions. Individual project costs and value propositions can be analyzed to determine viability, and compared to other solutions to select the best. During the project lifecycle, ROI analysis can continue to measure the costs of deployment and returns to assure that individual projects are delivering.

Accountability for financial returns from IT investments is the solution provider's responsibility as much as the corporations. Those solution providers that recognize financial justification as a key strategic weapon will reap the spoils of war

Appendix A: Typical ROI Dashboard Framework

Costs

- Software
- Computers
- Network
- Support and Maintenance Contracts
- Customization and Application Development
- Implementation
- Telecommunication
- Ongoing Support and Maintenance
- Training
- Professional Services

Risks

- Labor Resources
- User Acceptance
- Compatibility
- Vendor
- Management Commitment and Funding
- Market or Strategic
- Schedule
- Legal and Governance
- Organization
- Dependencies

Tangible Benefits

- Reduced Labor Costs
- Reduced Operations Costs
- Increased User Productivity or Eliminated Lost Productivity
- Increased Business or Reduced Business Losses and Risks

Intangible Benefits

- Brand advantage
- Strategic advantage
- Organizational advantage
- Competitive advantage
- Intellectual capital
- Risk avoidance

Net Tangible Benefits (ROI Analysis)

- Total Costs
- Cumulative Costs
- Total Benefits
- Cumulative Benefits
- ROI
- NPV
- IRR
- Payback period

ROI Dashboard Summary

- Net Tangible Benefits
- Intangible Benefits
- Risk

Appendix B: Security ROI Model – A Case Study

"There are only two things that management will respond to: spending less money and making more money," says a chief security officer from Canada. "Everything has to be explicitly reduced to one of those two, or it will fail." - Information Security Magazine, 2001 Industry Survey

"Financial support is obtained (or not) based on the requirement for security and the potential impact on the business operations," adds a chief security officer based in the mid-Atlantic US. "If perception is 'this is security for security's sake, then support is unlikely. If the perception is 'real requirement, real threat, real benefit to business operations,' then support is much more likely". - Information Security Magazine, 2001 Industry Survey

By applying the ROI Dashboard model to a specific business case, one can illustrate the steps it takes to build an ROI model, and just how easy even a tough issue like a security business case, can be to cost justify.

For this case study, we will discuss a proposed security initiative. The business case, overall will serve to justify the potential benefits of a security initiative in total. Because this is too large of a sample however, the model itself will address only a small subsection of security – virus protection.

To create the business case, we will follow the ROI Dashboard model explicitly, and illustrate that even a tough business case, such as justifying a security initiative, can be encapsulated into a solid financial justification. This business case can then be encapsulated into a tool such that the security solution provider can use the tool with clients to discuss the business opportunity for their security solution, and quantify the value proposition.

For the model, we will use the ROI Dashboard model, which is generically stated as follows:

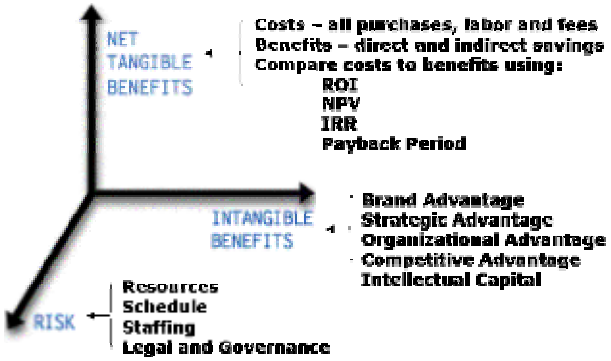

Figure 40: The ROI Dashboard combines net tangible benefits, intangible benefits & risk into a complete cost-justification tool.

To develop the business case, as is outlined in the ROI Dashboard model, we will utilize the following steps:

- **Step1:** Project Scope and Research, documenting the solution and potential opportunities
- **Step 2:** Define all Project Costs including all purchases, labor and fees
- **Step 3:** Estimate Potential Tangible Benefits including all direct (budgeted) and indirect (unbudgeted) savings and gains
- **Step 4:** Document Intangible Benefits such as brand, strategic, organizational, competitive and intellectual capital advantages
- **Step 5:** Calculate the Net Tangible Benefits by comparing Costs to Benefits using four key financial formulas
- **Step 6:** Document the Possible Risks such as resources, schedule, staffing and legal and determine what impact it may have on the business case

As with most business cases, we recommend performing the analysis over a three-year period. This should enable capture of all costs. And because technology investments are risky, and benefits beyond three years are difficult to achieve without a reinvestment, adequate consideration of returns should be realized.

Step 1: Project Scope and Research

The first step in any project is to outline the scope of the project and to determine what issues will be addressed – the overall opportunity. The solution we are developing the business case for is a solution provider who helps clients understand their security issues in total, and recommends first and third party plans, procedures and technology to help address all aspects of a company's information security issues.

Many companies when building an ROI model fail to define the product set adequately, likely leading to confusion over costs (what to include or exclude) and benefits (without knowing the product set, how can a set of benefits be derived?). Setting the scope correctly, and researching the model up front can obtain clarity obtained as to the mission of the tool, the products covered and the potential benefit opportunities.

As some background on the security opportunity, it is well known that security is a growing concern for many organizations, and for good reason:

- The number of organizations hit by Web server attacks doubled from 2000 to 2001[34]
- The cost of virus attacks alone on information systems around the world reached an estimated $13.2 billion in 2001[35]

The number of companies with insiders who stole, sabotaged, or intentionally disclosed proprietary data increased by 41% over last year, while those reporting physical theft of equipment by insiders nearly doubled.

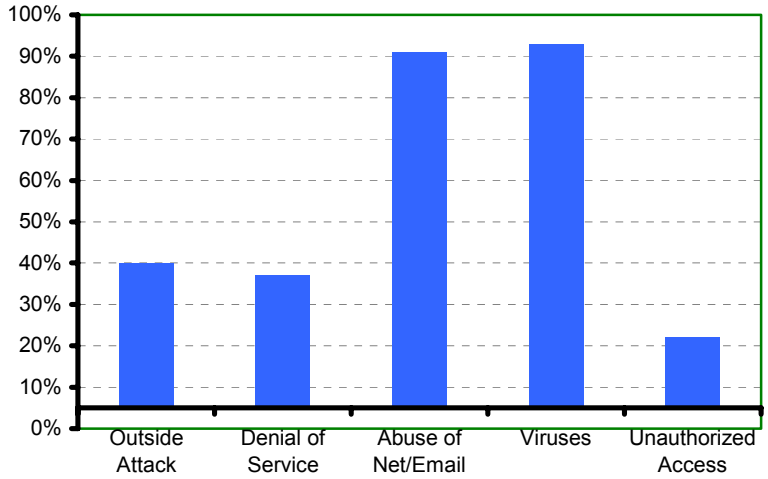

Figure 41: Computer Security Institute survey of 538 computer security practitioners, Spring 2001 reveals that viruses and abuse of Internet Access and E-mail are the most prevalent security issues. This often occurs despite point solution technology in place to prevent such issues.

[34] Source: Information Security Magazine, 2001 Industry Survey – October 2001 – online survey of over 2,500 information security professionals.

[35] Computer Economics, Carlsbad, California

One of the most detailed surveys on security is Computer Security Institute's survey of 538 computer security practitioners, in this case using figures from their Spring 2001 survey. In this survey, it was indicated that 91% of companies reported computer security breaches in the last 12 months, with 70% of the threats generated via the Internet, and 31% via internal systems and from insiders. Of the firms with security breaches, 64% of the firms acknowledging financial losses, averaging over $2 million per company over the past year.

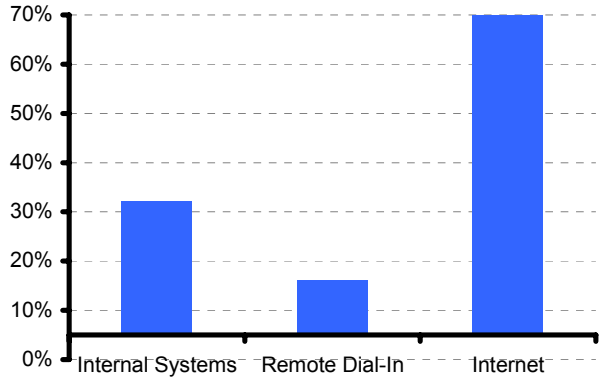

Figure 42: Computer Security Institute survey of 538 computer security practitioners, Spring 2001 illustrating that although many analysts have indicated that internal threats constitute 80% of the security breaches, in fact, this survey revealed the number to be closer to 30%. It should be noted that internal issues are usually under-reported, so that we believe the threats to be closer to even.

The security company addresses with professional services and technology, all of the most prevalent areas of security threats, including:

- Virus
- Denial of Service
- Physical Theft or Destruction
- Data Destruction
- Theft of Property and Information
- Illegal system access - outsider
- Unauthorized insider access
- Installation/Use of Unauthorized Software or Hardware
- Insider Abuse of Net Access / E-mail
- Financial Fraud

When a consultant or sales professional with the model engage a customer, it will be important to select which of these services the customer is interested in and which to include/exclude from the analysis. For each selection, costs should be included for the solution (purchases, fees and labor) and the scope of the threat being addressed and potential savings should also be scaled.

Step 2: Collect all Project Costs

The second step in the building the business case model is to create a framework to collect all of the costs for the proposed solution. For security, the following costs in general will be required to implement an effective program:

- Hardware
- Software
- Support and Maintenance
- Planning and Deployment Labor
- Professional Services
- Training and Learning
- On-going Management and Support

Since this is a new program, all of the costs are above and beyond the normal capital expenditures, labor allocation and fees. For each of the security threats a combination of each of these costs may be required to implement the solution. To illustrate how costs can be modeled, we will examine what it will take to tackle one of the potential security threats: Virus.

For a Virus solution the following are required:

- **Hardware** – dedicated server to distribute and manage virus software for the workgroup. A dedicated server is required for each major location, and for each 1,000 or so workstations.
- **Software** – an anti-virus server license is required for each anti-virus server, and protection licenses are needed for each Windows server, and each workstation being protected.
- **Support and Maintenance** – hardware includes free 3-year warranty and support, software comes with one-year support, but subsequent years are 15% of original purchase price annually.
- **Planning and Deployment Labor** – client labor will be needed to plan the installation and configuration, procure the systems, setup and install the hardware and software, test the system prior to deployment, and deploy the software to all client workgroups
- **Professional Services** – consultants will work with the clients to help plan the architecture, and setup and install the system.
- **Training and Learning** – it is recommended that one person from the client organization attend a formal management and support training class and that the costs will include a formal training course, travel and additional research, learning and teaching others both prior to and after returning from the course.
- **On-going Management and Support** – based on experience from the installed base, it is expected that the anti-virus software will generate at most, 100 help desk call per year per 1000 people, and that about 1 hour per month of system administrator time will be spent on maintaining and supporting the configuration.

For the model, each of these cost categories will yield a worksheet to calculate the individual costs. The worksheet for costs is typically driven from a configuration of the solution for the environment; therefore several questions are presented about the environment such as number of users, number of locations and complexity to help size the solution. In the proposed model, from the sizing of the solution, defaults are driven as to how much hardware and software is needed, how much planning and deployment labor is required, and so on. The use of intelligent defaults helps to guide salespeople, consultants and prospects to the correct solution without requiring individual research. In our example, the number of users and locations drive the amount of servers and software licenses needed, as well as helping to scale the labor required.

For simplicity, and as a worst case analysis for the examples in this model, all hardware and software purchases are treated as cash flow expensed, as opposed to considering depreciation or leasing – although both selections could certainly be added to the model. As well, growth in the size of the environment is held constant and increases in labor rates and burden rates are not included for simplification.

For the virus solution component, to illustrate the derivation of costs, the models for each cost subcategory are illustrated as follows:

Environment

Number of workstations	**2000**
Number of Windows servers	**50**
Number of locations	**3**

The number of workstations and number of Windows servers needing protection, and number of locations will be used to help size the solution and drive defaults for planning and deployment labor.

Hardware

Hardware	Units	Unit Cost	Total Cost
Dedicated Anti-Virus Server	3	$ 3,500	$ 10,500

For this virus solution, dedicated anti-virus servers are needed to manage the virus protection of workstations and servers. A server is needed for each location, so by default 3 servers are recommended. As well, if the number of users per server exceeds 1000, it is recommended that additional servers be added, and this too, can be handled automatically in the model as a rule to help reduce the guesswork by a consultant or sales professional.

Software

Software	Units	Unit Cost	Total Cost
Anti-Virus Server Licenses	3	$ 500	**$ 1,500**
Windows Server Licenses	50	$ 150	**$ 7,500**
Client Licenses	2000	$ 8	**$ 16,000**
Total Software			**$ 25,000**

For the software configuration, a server license is required for each anti-virus server, and a server or workstation license is required for each computer being protected.

Support and Maintenance

Support and Maintenance	Percentage of Software Cost	Total Annual Support Cost
Year 1	0%	$ --------
Year 2	15%	$ 3,750
Year 3	15%	$ 3,750

To obtain support and updates on the software, particularly a subscription to the anti-virus database, requires a support and maintenance fee of 15% per year, starting in year 2.

Planning and Deployment Labor

Planning and Deployment Labor	Person Hours	Burdened Labor Rate	Total Cost
Planning	20	$ 61.49	**$ 1,230**
Procurement	8	$ 39.79	**$ 318**
Setup and Installation	80	$ 54.26	**$ 4,340**
Testing	140	$ 47.02	**$ 6,583**
Deployment	100	$ 54.26	**$ 5,426**
Total	**348**		**$ 17,897**

To deploy the solution effectively will require an investment by the company of labor. The typical categories include planning, procurement, setup and installation, testing and deployment. For the model, estimating the hours required is available by examining customer installs and working with systems engineers from professional services. As a result of matching the size and complexities of the installations with the effort required, a model can be developed to predict the amount of labor required, and help guide sales professionals and customers to a conservative estimate of the workload required. It is important not to underestimate the effort required in the business case so as to set expectations correctly and assure success through budgeted resources.

Professional Services

Professional Services	Recommended Consulting Days	Unit Cost	Total Cost
Planning	1	$ 2,000	$ 2,000
Setup and Installation	1	$ 2,000	$ 2,000
Total	2		$ 4,000

It is important to include professional services, when offered, because they often help to reduce client's own investment, minimize risks during installation, and assure planned returns. The level of professional services required can be modeled based on the size of the engagement – environment or number of licenses.

Training Fees

Training Fees	Units	Unit Cost	Total Cost
Class Fees	1	$ 2,500	**$ 2,500**
Traveling	1	$ 1,750	**$ 1,750**
Total			**$ 4,250**

If training courses are offered, it is important to include training by default. As with professional services, training helps to reduce the costs and risks of deployment and on-going management and support. In complex models, we suggest that when training is zeroed, that the cost of planning and deployment labor and on-going management and support are increased to model the extra time it will take to perform installation and maintain systems. This can be similarly implemented for professional services. By scaling the costs when training and services are not included, the model can help justify these expenditures by demonstrating the value (decreased deployment and management costs and risks).

Learning and Teaching Labor

Learning and Teaching Labor	Person Hours	Burdened Labor Rate	Total Cost
Training and Independent Learning	16	$ 54.26	**$ 868**
Teaching	16	$ 54.26	**$ 868**
Total	**32**		**$ 1,736**

Often overlooked, internal labor that performs the setup and installation, and resources, which must support the solution, need to take the time to learn the technical details of the solution. Training certainly helps to reduce the amount of independent learning, but often, only one person goes to training and then this person, trains everyone else involved. Although difficult to estimate, it is important to include a worst-case estimate on independent learning (self teaching outside of formal training programs) and teaching of peers in the model.

On-going Management and Support

On-going Management & Support	Annual Person Hours	Burdened Labor Rate	Total Cost
Systems Management	12	$ 54.26	**$ 651**
Help Desk Support	43	$ 39.79	**$ 1,724**
Total	**55**		**$ 2,375**

Another major oversight in many models is to include the cost of on-going management and support. Many think the cost of a solution ends with installation, failing to include the amount of systems administrator labor it takes to maintain the servers and applications, or the help desk support to handle user issues. In this case, we estimate how many calls will be generated per user per year, using a 13-minute average call handling time.

In each of the models, salary data was obtained from analyst salary databases, but public data is available from salary.com or monster.com that rivals most analyst databases. A burdened rate of 35% was used, and a typical US work year of 1880 hours was applied to arrive at the hourly rate. International salaries, burden rates and work hours vary drastically and should be customizable to assure a proper business case model.

For each of the other solution components, similar models should be developed to capture all of the costs.

Step 3: Estimate Tangible Benefits

The third step in developing the ROI business case for security is to estimate all tangible benefits from the project – those that can be quantified. These will include all direct (budgeted) and indirect (unbudgeted) savings and gains. This is the difference between the risks and costs before the security solution versus after implementation.

To determine the tangible benefits, one must look at the scope of security threats that exist, and when an issue occurs, what are the costs to the organization. Because the organization has little to no security in place today, we'll examine the full scope of issues, and all of the impacts the security breaches impart on the company.

The possible security issues, with researched probability of impact and incidents per year are as follows:

Security Threats	Percent of companies reporting incident over last 12 months	When reported, the estimated incidents / 1000 employees
Virus	94%	10
Denial of Service	36%	2
Physical Theft or Destruction	49%	6
Data Destruction	22%	1
Theft of Proprietary Information	22%	1
Illegal system access - outsider	40%	2
Unauthorized insider access	56%	5
Installation/Use of Unauthorized Software or Hardware	78%	25
Insider Abuse of Net Access / E-mail	91%	17
Financial Fraud	9%	1

Source: Alinean, LLC, Information Security Magazine Survey 2000/2001 and Computer Security Institute, Spring 2001

Because the probability of occurrence is known, i.e. the likelihood a company will face the security issue, and the number of incidents per company has been estimated, a model can be built to predict the potential risk to any prospective client. The formula for this in the ROI model should be:

Probability of security breach occurring * estimated number of incidents / 1000 users * number of users = predicted number of incidents per year.

For our Virus example, the predicted number of incidents per year for our sample environment can be estimated as follows:

94% probability of occurring to a company * 10 incidents / 1000 users * 2000 users = 18.8 virus incidents expected annually

Now that we can estimate the number of events the company can expect to occur during a given year, the impact to the organization needs to be estimated to complete the benefits model. When a security breach occurs, the company can be impacted in several ways including:

- **Find and Repair Vulnerability and Damages** – the administrator and support time and related tangible labor expenses to find the issue, repair the damaged system and recover data, and assure that the security hole is filled so the issue does not occur again.
- **Downtime** – lost productivity and business revenue/profit while the systems/applications are down and during repairs and restoration
- **Legal Impact** – litigation, settlements and fines such as those that may result from the Business Software Alliance (BSA) for illegal software installations, or via non-compliance to the Health Insurance Portability and Accountability Act (HIPAA) and Gramm-Leach-Blily (GLBA) bills which mandate that companies ensure the privacy and confidentiality of personal medical and financial information from internal threats.
- **Competitive Impact** – the often difficult to quantify loss of customers and market share because of system unavailability or customer dissatisfaction - a growing concern when competition is literally a click away
- **Bad Public Relations** – the often difficult to quantify damage to company brand image due to security breach

Security Threats and Estimated Impacts	Total Impact per Incident
Virus	$24,000
Denial of Service	$122,000
Physical Theft or Destruction	$15,000
Data Destruction	$350,000
Theft of Proprietary Information	$4.5 million
Illegal system access - outsider	$225,000
Unauthorized insider access	$60,000
Installation/Use of Unauthorized Software or Hardware	$250,000
Insider Abuse of Net Access / E-mail	$360,000
Financial Fraud	$4.4 million

Source: Alinean, LLC, Information Security Magazine Survey 2000/2001 and Computer Security Institute, Spring 2001

For the Virus example, studies indicate that a typical virus repair effects a workgroup of an estimated 14 people per incident, taking 24 person hours to repair and 4 hours of downtime per person when infected. For the tangible impact of such an incident the calculations are as follows:

Virus Incidents per Year

	Probability of occurrence	# of incidents/1000	Estimated annual incidents
Virus Incidents	94%	10	18.8

The first step in analyzing the benefits is to calculate the opportunity for savings. In this case, it is the number of virus incidents that occur and their associated cost. As illustrated prior, security issues can be estimated based on their likelihood of occurrence, and the expected number of incidents – both averages for similar companies.

Find and Repair Labor Costs Opportunity

	Estimated Annual Incidents	Avg. Person Hours Per Incident	Total Annual Person Hours	Burdened Labor Rate	Total Annual Cost
Find and Repair Labor	18.8	40	752	$ 54.26	$ 40,800

One of the opportunities for savings is the cost it takes to find and repair damaged systems and restore data. Using industry data, or estimates from professional services and customers, the average repair time for incident is estimated. Using the labor rate for the person doing the repairs, in this case a systems administrator, the total annual cost can be estimated for the predicted number of attacks.

Find and Repair Labor Savings

Find and Repair Labor Savings	Total Annual Cost	Estimated Savings from Solution	Projected Savings
	$ 40,800	65%	$ 26,520

Once the cost opportunity is understood, $40,800, the benefits of implementing the virus solution can be projected. Here, conservatism must reign such that the savings estimates are reasonable, and have been validated by industry analysts, professional services and customers. In this case, we

expect the impact of the virus solution to generate a 65% overall savings. This is a rather simple savings model. A more complex model can be developed which projects savings by reducing the probability of attack, the scope of the attack, the amount of time it takes to resolve the issue, or a reduction in the skill level/salary of the labor involved.

Downtime Opportunity

Downtime Costs	Estimated Annual Incidents	Downtime per incident	Number Users effected	Avg. User Burdened Labor Rate	Total Annual Cost
	18.8	8	30	$ 32.55	146,880

Viruses can cause substantial downtime when they occur. For this model, studies indicate that each virus attack caused 8 hours of downtime per incident, and on average infected 30 users. For a conservative business case, the downtime costs will consider lost productivity from the virus attacks, the work time lost by users while waiting for the repairs and restorations to occur. However, business losses could have been used for a more costly opportunity. On average business losses for key systems are much higher than productivity losses – averaging $42,000 per hour in general.

Outage Cost per Minute	Business Impact
Supply Chain Management	$ 11,000
Electronic Commerce	$ 10,000
Customer Service Center	$ 3,700
ATM/POS/EFT	$ 3,500
Messaging	$ 1,000

Figure 43: Estimated business loss per minute for various applications. Downtime is always difficult to estimate or average because all outages are different. Longer outages cause more issues than short glitches. Complex models can be built to better estimate the true cost of downtime, but we have found that keeping the model simple, applying conservative savings estimates, and discounting the ultimate realized benefits due to risk is the best method to arrive at a bottom-line impact for the business case.

Downtime Savings

Downtime Savings	Total Annual Cost	Estimated Savings from Solution	Projected Savings	Realized Benefit Factor	Realized Benefit
	$ 146,880	65%	$ 95,472	65%	$ 62,057

For downtime savings, again the 65% savings estimate was used against the opportunity to derive the savings. But notice that an additional discount was applied to the savings result. As should be applied to all indirect (unbudgeted) savings, a discount should be applied to account for the fact that not all of the savings will result in recovered or increased productivity or business, and for the fact that indirect savings estimates carry more risks than direct savings estimates – i.e. both the costs and savings are difficult to model accurately. As such, the savings are discounted by 35%, using a 65% realized benefit factor. Without this factor, many models produce unrealistic results for indirect savings, and set unrealistic benefit estimates. To obtain customer buy-in, a conservative figure will help the sales professional gain credibility, and will serve to set correct benefit expectations.

The benefits of the security solution can affect several sections of the security risk model:

- Reduce the likelihood of occurrence and range of impact
- Reduce the time to find and repair
- Reduce the downtime
- Reduce the exposure to legal liability, fines, competition and brand impacting negative public relations.

For each of these issues, the model needs to provide an estimate for the improvement the solution will deliver.

Step 4: Document Intangible Benefits

Once the tangible benefits are developed, intangible benefits, those that are difficult to quantify, such as brand, strategic, organizational, competitive and intellectual capital advantages should be documented.

For security solutions, intangible benefits typically center around legal compliance and risk reduction, competitive loss avoidance and public relations damage avoidance.

For security solutions, legal intangible benefits can include:

- Compliance with Health Insurance Portability and Accountability Act (HIPAA)
- Compliance with Gramm-Leach-Blily (GLBA) bills
- Elimination of risk from Confidential Information Disclosure
- Elimination of possible Sexual Harassment and Discrimination litigation and settlements
- Elimination of Employee Reprimand and Dismissal

For competitive loss avoidance, intangible benefits include the additional impact of downtime on lost customers. When systems are down, especially for prolonged periods, often business cannot be conducted. In the tangible benefits, the loss of productivity or business is tallied, but this often does not catch the more serious impact of losing a customer for life. The tangible calculations often underestimate the impact of the lost customer by not counting the lifetime value of a lost customer. For example, at Omega Engineering's Bridgeport NJ manufacturing plant, a former network administrator planted a software time bomb that systematically erased all of the programs and data that ran the company's manufacturing operations. With the only backup tape also missing, the plant was no longer able to manufacture. This caused $12 million in damages, and permanently effected Omega's competitive and strategic positioning. This upside cost/savings can be tallied as a tangible benefit, or documented as potential upside savings in intangible benefits.

When a security issue is publicly disclosed, which many companies must do, the impact can be a loss of confidence in the company. After all, when a company is subject to security issues, how can clients trust that you will be there when they need you, and that they are safe providing you with their operations or data? Some high profile examples illustrate the damage that can occur to a company's brand image:

- On October 25, 2000 Microsoft acknowledged an attack on the company's corporate jewels with unlimited ramifications. A hacker penetrated Microsoft's corporate network for as many as 12 days, accessing and possibly stealing important operating system and office source code. –Indications are that the attack may have originated from a Microsoft employee's or contract worker's home PC. The attack installed malicious software that allowed the hacker to log in remotely to Microsoft's network.
- A glitch in AT&T's web site exposed billing and account information for thousands of small businesses. The glitch allowed any of the small business customers to view any other customer's records. With small business at the core of AT&T's success, disclosure of the issue was a major blow to AT&T's credibility.
- Charles Schwab recently confirmed its Web trading service was briefly vulnerable to a security flaw that could allow an intruder to hijack a subscriber's accounts. With privacy and security at the core of any financial institution, such an issue surely had an impact on Charles Schwab's brand name.

Predicting the likelihood of a security incident which will cause bad press, and estimating the cost of the impact is near impossible, therefore issues such as these are typically documented as intangible, and the possible savings resulting from the solution can be tallied against the opportunity.

Step 5: Calculate the Net Tangible Benefits

The next step is to calculate the net tangible benefits, comparing Costs to Benefits using four key financial formulas.

The model should begin the process by summarizing the costs and benefits.

Costs

Costs	Initial	Year 1	Year 2	Year 3	Total
Hardware	$ 10,500				**$ 10,500**
Software	$ 25,000				**$ 25,000**
Support and Maintenance	$ ----------	$ ----------	$ 3,750	$ 3,750	**$ 7,500**
Planning and Deployment Labor	$ 17,897				**$ 17,897**
Professional Services	$ 4,000				**$ 4,000**
Training Fees	$ 4,250				**$ 4,250**
Learning and Teaching Labor	$ 1,736				**$ 1,736**
On-going Management and Support	$ ----------	$ 2,375	$ 2,375	$ 2,375	**$ 7,126**
Total	**$ 63,383**	**$ 2,375**	**$ 6,125**	**$ 6,125**	**$ 78,009**

To summarize, the model indicates that cost of implementing the virus solution is $63,383 initially, with $2,375 in year 1 and $6,125 in years two and three in additional expenses. The model takes a worst-case view by not utilizing depreciation to discount the immediate expenses for procuring the hardware and software.

Tangible Benefits

Tangible Benefits	Year 1	Year 2	Year 3	Total
Find and Repair Labor Savings	$ 26,520	$ 26,520	$ 26,520	**$ 79,560**
Downtime Savings	$ 62,057	$ 62,057	$ 62,057	**$ 186,170**
Total Savings	**$ 88,577**	**$ 88,577**	**$ 88,577**	**$ 265,730**

The tangible benefits from the model yield an estimated $88,000 in savings annually, a total of $265,000 over three years.

Net Tangible Benefits

The costs and benefits are compared using the four tangible metrics of project evaluations: ROI, NPV, IRR and payback period, with the following results:

Net Tangible Benefits	Initial	Year 1	Year 2	Year 3	Total
Costs	$ 63,383	$ 2,375	$ 6,125	$ 6,125	$ 78,009
Benefits	$ -	$ 88,577	$ 88,577	$ 88,577	$ 265,730
Net Benefits	$ (63,383)	$ 86,202	$ 82,452	$ 82,452	
Cumulative Costs	$ 63,383	$ 65,758	$ 71,884	$ 78,009	
Cumulative Benefits	$ -	$ 88,577	$ 177,154	$ 265,730	
Cumulative Net Benefits	$ (63,383)	$ 22,818	$ 105,270	$ 187,722	
Three Year Net Savings	$ 187,722				
Net Present Value (NPV) Savings	$ 146,905				
Internal Rate of Return (IRR)	97%				
Return on Investment (ROI)	241%				
Payback Period (Breakeven)	9 months				
Cost of Capital	9.5%				

In the model, the costs and benefits are compared to generate several key results. The first is net benefits, the simple difference between costs and benefits. Using this total, the three-year net savings are calculated to be $187,722.

The net benefits, when brought into today's dollar terms with a cost of capital of 9.5%, yield a Net Present Value savings of $146,905.

The NPV was calculated using the formula:

$$NPV = I_0 + \frac{I_1}{1+r} + \frac{I_2}{(1+r)^2} + \ldots + \frac{I_n}{(1+r)^n}$$

Where the *I* 's represent the net benefits for each year, with the *subscript 0* representing the initial net benefit, the *subscript 1* the year one net benefit, and so on. The exponent in the denominator is also equal to each year of the analysis, up to n, the number of years in the analysis term, in this case 3. The discount rate (or cost of capital) is *r* and is held constant through the analysis period, in this case 9.5%.

Next, the model calculates the internal rate of return, the cost of capital it would take to get the NPV to be zero, and in more practical terms, the effective interest rate another investment would have to achieve to reach the returns from this project. For this project, the effective rate of return is 97%.

The return on investment (ROI) formula is calculated at 241% using the formula:

ROI = (benefits – costs)/ costs * 100%

For this project, the ROI is estimated to be 241%, meaning that each dollar invested, will yield $2.41 in net returns (the original dollar, plus $2.41 additional).

Finally, the model calculates the payback period. This is achieved by plotting the cumulative costs verses the cumulative benefits over the analysis period. Where the benefits become positive, the project generates positive cash flow. This point in time is termed the breakeven point, and the time it takes to achieve breakeven is the payback period. For this model and dataset, the payback period is 9 months.

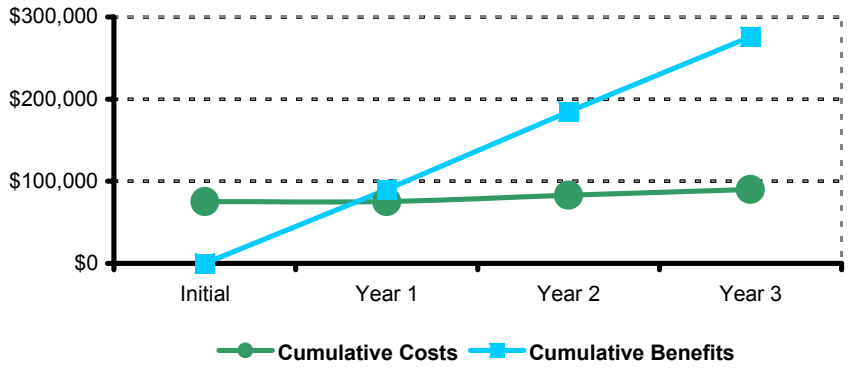

Figure 44: Cumulative costs verses cumulative benefits are plotted to determine the payback period and breakeven point.

Step 6: Document the Risks

The final step for the project is the documentation of risks, and an analysis of how the risks may impact the predicted results. Risks can include such vital factors such as resources, schedule, staffing and legal and determine what impact it may have on the business case.

For security in general, risks may include:

- Adequate resources to develop the security policies and implement the technology
- Lack of trained personnel to develop the security policies and implement the technology
- Demanding schedule to plan and implement
- Sharing of resources amongst multiple projects
- Lack of executive commitment to security initiatives
- Underestimation of workload required or capital required to plan and deploy solution
- Stability of company selected to provide consulting or technology
- Underestimation of support costs once solution is deployed
- Poor returns because measures fail to prevent successful attacks
- Legal liability should the measures fail
- Decline in customer and user satisfaction sue to intrusiveness
- Lack of adoption amongst business units and users

For each risk, a mechanism should be provided for documenting the risk, ranking the probability and potential impact, and assigning a leader t0o help track and mitigate the issue.

Appendix C: TCO vs. ROI

"TCO is defined as the total cost of procuring, using, managing and disposing of an asset over its useful life." – Bill Kirwin - the Father of TCO, Gartner

"Lower TCO doesn't mean higher ROI: This is a classic error. The assumption is that if you whittle down the cost of a resource, it will provide a higher return on investment. Not! If I buy a cheap used car and lose my job because I can't get to work reliably, did I really save money? Sure, IT must control costs, but not through some arbitrary goal that isn't linked to real business drivers." Lenny Liebmann, ComputerWorld

Total Cost of Ownership (TCO) refers to a useful accounting system to tally all of the costs associated with a given asset, particularly accounting for costs beyond just the initial purchase price. In order to appreciate the total cost of an asset, costs such as procurement labor, management and support need to be considered. As well, computer assets have hidden costs such as shadow support (peers supporting each other in lieu of formal support) and downtime impacts. Before TCO, many IT executives and even solution providers were unaware of the true cost of computing. TCO made everyone poignantly aware of the issues.

TCO became popular in the late 1980s and early 90s because distributed systems were being implemented en-mass as they were perceived to be much less expensive than prior data center computer systems. In fact, although there were cost advantages, these advantages were much less than expected because of hidden costs. These studies, particularly those from Bill Kirwin at Gartner,[36] determined that the purchase price of the hardware and software was only 15% of the total cost of owning the asset. Management, support and hidden indirect expenses accounted for 85% of the total cost over the useful life of the asset. At the time, a PC that cost $2,000 to $3,000 might actually cost the organization over $8,000 per year or more to keep in service.

	Annual Cost per user
Direct Costs (budgeted)	
Hardware and Software	$1,903
Management	$1,345
Support	$1,094
Development	$345
Communications	$610
Total Direct Costs	*$5,305*
Indirect Costs (unbudgeted)	
End User Operations	$3,357
Downtime	$ 830
Total Indirect Costs	*$4,187*
Annual TCO per User	**$9,493**

[36] Benchmark studies by Bill Kirwin at Gartner in the late 80s and early 90s put TCO on the map. These studies, starting in 1989 and continuing through today, helped IT managers better understand the issues of distributed computing ownership. TCO created a common language and framework to highlight the issues, and drive vendors to improve the manageability and reliability of distributed computing. Studies from Gartner and other analysts now cover almost every aspect on the total cost of technology ownership.

TCO was an excellent tool that analysts could use to highlight that manageability and availability of systems was important. Reducing these costs should be a focus of solution providers and IT professionals alike. With more manageable systems, costly systems administration and support costs could be reduced, as well as reducing costly shadow support. With more reliability, support costs could be further reduced and downtime impacts could be eliminated. TCO trained the IT community to look beyond purchase costs alone, and to focus more on manageability and hidden costs.

TCO however came under criticism because although it provided a useful framework for accounting for all of the costs of owning an asset, it placed little on the value of the asset towards meeting business goals. As many would say, to lower TCO we could all resort to pen and pad, which has a TCO of $1.50, compared to an estimated $7,000 per year for the typical Windows computer system. Rightly so, that by focusing on costs alone, the benefits of and between proposed computer systems could be overlooked.

With a basic understanding of TCO, how do ROI and TCO compare? ROI analysis and TCO are related in that they both use similar taxonomies for cost accounting – a chart of accounts. However, ROI differs from TCO in a number of ways as follows:

1. TCO is an annual cost figure that is an average cost of ownership over a five year period, without regard to the benefits of owning or using the asset, while ROI looks at the implementation costs as they occur, and the derived benefits of the project, to tally the total positive and negative impacts of a planned project and its financial viability;
2. ROI looks at only the categories of costs and benefits that directly relate to a project, while TCO is a full cost accounting of every aspect of IT;
3. TCO is a good management tool for uncovering cost issues, while ROI is an essential tool for evaluating the costs and benefits of a planned project and at evaluating cost cutting measures.

As indicated, TCO is a valuable tool for tallying and understanding the costs of purchasing and managing a computer system, and to assist in establishing a comprehensive IT budget. ROI accounts on a project basis not only the costs, but benefits of solutions, and can provide a valuable tool for not only tracking budgets, but determining if those budgets, and particularly individual or a portfolio of IT projects, are deriving tangible and intangible returns to the company.

Some key formulas relating TCO to ROI include:

TCO Before – TCO After = Total Savings from Infrastructure Improvement

Value (ROI) = Net Benefits / TCO

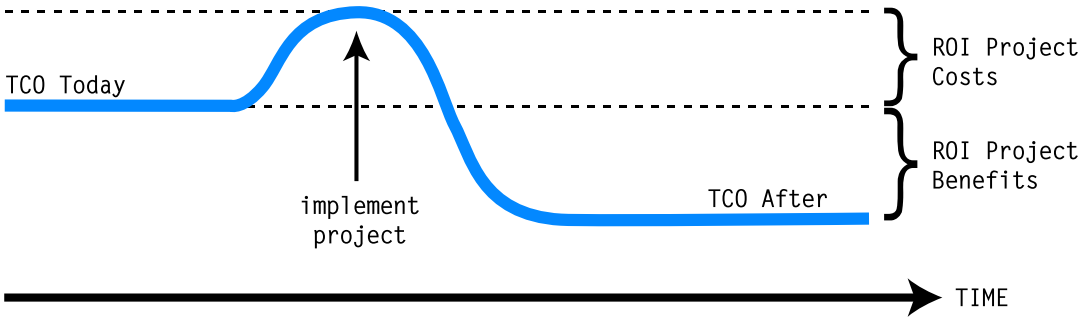

Figure 45: TCO and ROI compared

Appendix D: Before Tax or After Tax Analysis

"In most cases, the GAAP rules that affect IT require that managers pay closer attention to what IT projects are supposed to accomplish because the nature of the work affects how its cost will be treated for accounting purposes." – Steve Alexander, ComputerWorld

It should be emphasized that no rigorous application of financial consequences can occur until after the basic cost and benefit assumptions are clearly stated and agreed to in what is commonly referred to as a cash flow analysis. Nevertheless, following that agreement, Tax implications should not be ignored.

Many debate whether the ROI analysis should occur with, or without the impact of taxes. This debate is further clouded by the fact that companies use different accounting methods, the treatment of costs and profits, when doing financial analysis and reporting verses reporting to the IRS. To understand what is the correct approach for a given organization requires a basic understanding of how accounting rules affects costs and profits.

For costs, many of the hardware, software, training, consultant and development tool expenses, as well as some of the labor for a project can be deducted on the corporate tax returns. The expense deduction reduces the profits by the amount of the expense, and therefore the tax burden and expense. But the way that the expenses are treated can effect how they can apply against the tax liability of the corporation. Capitalized costs are written off against profits over several years. Expensed costs are written off immediately against current profits. **In general, depreciation is intended to give corporations the opportunity to offset costs and benefits in the same calendar year in order to reduce immediate taxes, so up front investment costs can be deferred to align with revenue inflows.**

The way that accountants must treat the expenses, whether they are capitalized or expensed can add greatly to the complexity of the ROI analysis. The rules for the treatment of the profit and expenses is driven by Generally Accepted Accounting Principals (GAAP), which provides standard guidelines which most accountants follow when preparing financial reports and performing business analysis. [37] It is extremely important to note that the GAAP principles and the way costs and revenue are treated, differs from those rules which may be used when preparing taxes and reporting to the IRS, further complicating the accounting and tax basis consideration.

Several of the financial complexities regarding accounting principles and taxes include:

- **Depreciation**: If the hardware and software expenditures are above a certain dollar amount, often called the capitalization limit, the cost of the hardware or software is depreciated over the standard useful life of the asset. The capitalization limit is typically set at $50,000 to $100,000, Depreciation can be performed using several different methods including straight line or accelerated depreciation methods such as double declining balances. The depreciation calculation is made more complex in that the methodology selected for financial reporting and analysis may be different than the rules that apply to IRS tax reporting, where the limits on what can be expensed are typically less than $25,000 - meaning that any expense greater than $25,000 must be depreciated. As well, certain companies use different depreciation methods when doing financial reporting than when preparing tax returns.

[37] The original GAAP doctrine was set forth by the Accounting Principles Board of the American Institute of Certified Public Accountants, which was superseded in 1973 by the FASB, an independent, self-regulating organization. GAAP is the basis for preparing and reporting information that is included in the financial statements a company distributes to its shareholders. But when it comes to calculating income for tax purposes, a company may be called upon to use different methods based on tax law and Internal Revenue Service rulings. IRS rules frequently differ from GAAP.

- **Leasing:** Sometimes, a company may choose to lease hardware or software rather than purchase it outright. The lease must actually be a lease, and not a thinly disguised purchase, in order to deduct the lease expenses. If equipment is leased for a year at a time, the lease is valid and it's not considered to be corporate asset. As a result, its cost must be treated as an expense taken out of current profits. But if the lease contract contains what might be considered "bargain" terms for converting the lease to a purchase, GAAP rules assume that the leased computer equipment is an asset that must be capitalized, or written off against profits, over a period of several years.
- **Product Start-up Costs**: If the ROI business case is for an IT investment that will be an integral part of or generate a new line of business for the company, different stages of development dictate the treatment of the costs for tax purposes. During a preliminary period of research and development, costs are directly expensed without depreciation. During the period of product development when the product's requirements are known and the effort is deemed feasible these investments are not deducted immediately, but must be capitalized over time; taking a portion of the expense over a several year period. Finally there comes a point in time where the product is in production and on-going costs of support are balanced against direct revenues. In this case, costs are directly expensed.
- **Software Development Capitalization:** Software development expenses that apply to software developed for internal use, those not packaged and sold for customers, are typically capitalized. Because companies can't function without this software, the time spent implementing or testing new software is considered part of the creation of an asset that will benefit the company for several years. As a result, labor costs for software development are often capitalized over several years.
- **Training Costs:** Training costs are almost always expensed because they're considered a cost of doing business rather than a cost of creating an asset. Under the same theory, software maintenance costs are also a part of doing business and therefore should be expensed.
- **Business Process Reengineering:** Because of a specific GAAP accounting policy, all business process re-engineering costs have to be expensed, or charged against current profits, at the time they're incurred. This includes the implementation of any computer systems involved in the reengineering project, or systems used to evoke the change in business process within the organization. This is far reaching in that it includes systems such as ERP, B2B platforms, supply chain automation, sales force automation, eCRM, human resource automation and on-line collaboration systems where all of the related capital and labor systems are typically expensed.

For the benefits, there are also several complexities, which occur when accounting and tax treatment are considered:

- **Labor Savings and User Productivity:** This class of savings can generate a reduction in labor costs, which may directly increase the profitability and therefore the tax liabilities of the company. Therefore, the labor savings should be reduced by the company's effective tax rate, acting to reduce the benefits of the labor cuts. But if the company is not profitable, the labor savings do not generate a tax impact, and therefore the total labor savings can be considered, making the analysis quite complex, especially when the company is on the border between posting profitability or a loss. Even more complex, is the fact that the savings can push the company from one tax rate to another higher rate, but this may not be known until the company's overall earnings are reported.

- **Capital Cost Reduction:** The capital cost savings act much like labor cost savings in that they may increase the company's profitability and create more of a tax liability. Again factors such as whether the company is profitable or not and what the effective tax rate is, will effect the treatment of the savings. Making capital cost reductions more complex however is the fact that the costs against which these savings are applied may have been treated as an expense, or they may be capitalized.
- **Business Benefits:** The business benefits are additional profits, which when added to the company's current profits, may cause an increased tax liability. Again, the company's profitability and effective tax rate come into play to add to complexity in how to treat the analysis.

It is because of these complexities, that many companies seek to use a cash flow analysis method when analyzing ROI. Alternatively, IS executives officially recruit finance or accounting personal to assist in the formal analysis when accounting and tax considerations are applied. With a cash flow analysis, depreciation, amortization and taxes are not part of the analysis, simplifying the calculations greatly. It is recommended that all projects be considered on a cash flow basis first. The cash flow analysis is typically worst case, and if the project makes sense on a cash flow basis, the analysis can proceed to include accounting treatments and tax consequences. Using the accounting and tax treatment, the project's affect on the company's financial reports and tax liabilities can be determined.

Appendix E: Glossary

Alinean	Spanish for "align". A software company pioneering the development of financial analysis tools to help better align business goals with IT initiatives to provide greater returns from technology investments.
Allocated Benefits	Often the benefits from implementing a project are not directly translatable into bottom line savings for the company. As an example, user productivity gains may be attributable to the project, but the time the users gain may not lead to productive time. Users may use the re-gained time for non-work related tasks. To account for the lack of direct translation to bottom-line benefits, a discount rate is provided.
Analysis Period	The time for which the costs and benefits are tallied and analyzed. For IT investments, a three-year analysis period is standard because most IT investments are obsolete after that time frame.
Breakeven (payback period)	Comparing cumulative costs verses cumulative benefits, the exact point in time at which the cumulative benefits exceed the cumulative costs, generating positive cash flow from the project investment.
Burden Rate	Burdened rate is used to scale annual salaries such that they include taxes, health benefits, retirement benefits and vacation.
Business Advantage	Projects that are implemented to drive new business or meet strategic initiatives, where the intangible benefits are the drivers towards implementation and as such, hold greater weight over tangible gains when assessment is performed.
Business Benefits	The estimated gain in company revenue and profit by implementing the solution, such as increased customer conversion, increased customer retention and reduced sales cycle duration.
Capital Savings	The savings in capital related operations expenditures such as hardware, software, network equipment, supplies, telecommunications, power and space.
Cumulative Benefits	Over the analysis period, the cumulative benefits generated by the investment. For each year, the sum of the current and all prior years benefits.
Cumulative Costs	Over the analysis period, the cumulative costs of the investment. For each year, the sum of the current and all prior years costs, including the initial cost.
Discount Rate (cost of capital, opportunity cost and hurdle rate)	The discount rate, also called the cost of capital, is the interest rate at which a company can borrow money. This rate is typically equal to, or some calculated rate above prime rate, or other standard financial metric. The value can typically be determined by finance. Cost of capital is used within the ROI, NPV and IRR calculations as a means for getting future cash flows into present dollar value terms. For some IT departments, the discount rate is set, not at the interest rate, but to the hurdle rate to determine if a project makes sense. Rather than setting the discount rate at the borrowing interest rate, the discount rate is set to the absolute minimum return that the project must yield in order to be considered. By setting the discount rate to the hurdle rate, if the project yields a positive return, it can be considered, and if it yields a negative term, it should not be considered. Other times, the discount rate is set at the opportunity cost, the amount of gain a company could achieve by investing the designated capital for the project in other investments. It is recommended that the discount rate be maintained as the cost of capital, rather than the opportunity cost or hurdle rate. By using the discount rate, the financial results

	can then be compared to minimum returns and the gains from other investments, using the calculated values, rather than the calculations themselves to determine project validity.
GAAP Accounting Rules	A set of nationally (United States) recognized accounting standards referred to as Generally Accepted Accounting Principals (GAAP). Using GAAP accounting standards, costs and benefits are accounted for in a recognized way to assure consistency with your firms accounting principals, and for comparing various projects and investments with one another.
Information Productivity	Information Productivity compares your company's Net Economic Output (Economic Value Add) to the Information Inputs to yield a measure of your Information Productivity. It is the easiest and most reliable way to determine whether the investment in Information Technology and Services is yielding a positive macro-economic result on the company's performance and shareholder value. The doctrine of Information Productivity was developed and refined by Paul Strassmann (www.strassmann.com) over the past 20 years.
Infrastructure Projects	Those projects which are needed to keep the business running or to make the business more efficient and where tangible benefits play a greater role in decision making
Intangible Benefits	Those benefits of a project that are significant, but cannot be easily quantified into dollars and cents. The intangible benefits for a project, particularly those projects that create a business advantage, may be more important than the tangible, quantifiable benefits. Intangible benefits can be grouped into major categories which include: ▪ Brand advantage ▪ Strategic advantage ▪ Organizational advantage ▪ Competitive advantage ▪ Intellectual capital ▪ Risk avoidance
Internal Rate of Return (IRR)	Want to know what a similar investment would need to earn in order to compare with the returns on this project? Internal rate of return (IRR) calculates the interest rate received for an investment consisting of costs and income that occur over the analysis period. By analyzing the costs, and when they occur, compared to the benefits over time, the IRR calculation estimates the return from the project as an interest rate calculation. When comparing project returns it is important to consider that although a project's return may be higher, that there are other factors to consider such as investment required and risk. If a low risk, low investment project returns 100% IRR, but a higher risk, high investment project returns 200% IRR, the lower risk, investment, return project indeed may be a more sound investment.
Labor Savings	A benefit wherein headcount can be reduced or re-allocated, resulting in labor savings.
Net Present Value (NPV)	A dollar has a value today that is different than it was five years prior, and as such, will be different five years in the future. Because of inflation, a dollar five years ago was worth more than it is today, i.e. It had a higher buying power. It can also be projected that a dollar today is worth more, has more buying power, than a dollar in the future. This is referred to as the time value of money. When analyzing an investment, it is important that future expenditures and benefits be normalized to account for the time value of money. If there is a cost today of a dollar, that promises a return in the future, that return has to be brought back into the terms of today's dollar expenditure in order to see if the investment is worthwhile. Net Present Value analysis normalizes the cumulative costs and savings over time into today's dollar terms, discounting future benefits and tallying a total net of the investment into today's dollar terms. A positive net value provides a positive investment, while a negative net value represents a project that is not worth investing in. Typically, net present values need to exceed a certain value in order to substantiate investment, rather than just being positive.
Net Tangible Benefits	A summary of costs verses tangible benefits, summarized with four key measures: ROI, IRR, NPV and payback period.
Payback Period	(see break-even)

Productivity Savings

A benefit wherein users are made more efficient through the implementation of the product, enabling additional workload, or savings that can be directly applied to additional work related tasks. As well, productivity savings may be considered as loss avoidance, i.e. a gain in productivity due to increases system up time.

Often, productivity savings are adjusted downward because not all productivity savings are translatable to bottom line gains to the company.

Return on Investment (ROI)

The ROI is a return ratio that compares the net benefits of a project, verses its total costs. For example, if a project has an ROI of 200%, the net benefits derived from the project are double those of the expected total costs to implement the project. As such, the ROI calculation represents the relative value of the project's cumulative net benefits (benefits less costs) over the analysis period, divided by the project's cumulative total costs, expressed as a percentage.

Risk

Foreseeable events that may jeopardize the project's time schedule, costs and benefits. Risk can be measured based on probability of occurrence and severity should it occur. Risks that should be examined and managed include:

- Labor Resources
- User Acceptance
- Compatibility
- Vendor
- Management Commitment and Funding
- Market or Strategic
- Schedule
- Legal and Governance
- Organization
- Dependencies

Risk Adjusted ROI

Risks can impact the costs of a project, and can undermine planned tangible and intangible benefits. Risk adjusted ROI uses risk as a factor to scale costs, typically higher, and benefits (typically lower) to accommodate the fact that returns might be compromised due to risks in implementing and deploying the solution.

Risk Management

Risk management is a process whereby top risks are discussed, documented, ranked and assigned such that the risk can be mitigated. Over time, the risks are updated and reviewed to assure that the likelihood of occurrence is reduced, and that new risks are recognized and handled.

ROI Dashboard

A methodology that takes ROI from a traditional financial calculation, into a modern IT management tool. ROI is expanded to include not just an analysis of the tangible benefits of a project, but intangible benefits and risks as well. And the ROI is not used for a single project purchasing decision, but rather as a tool to make better selection decisions and measure the performance of deployed solutions across the entire portfolio of IT projects.

Sales Cycle

The time it takes for a vendor to secure a sales contract with a customer, from first contact to deal close. Sales cycles for large IT purchases, those greater than $1M, are measured in 9-12 months.

Service Level Agreement

A contract of service promising specific levels of performance, availability, response times and penalties should the performance not meet expectations. ROI based service level agreements have not been implemented, but are proposed as a possible way for solution providers to better partner with customers and share in the success of the solution, and for customers to assure that they achieve promised returns.

Tangible Benefits

Those benefits that can be quantified into dollars. These may include labor savings, operational cost savings, increased productivity or increased profit (business benefit).

Total Cost of Ownership (TCO)	TCO accounts for all of the costs associated with procuring, deploying and owning IT systems. TCO studies over the past ten years have determined that the cost of the hardware and software is only 15% of the total cost of owning the asset. Management, Support and Indirect expenses account for 85% of the total cost. ROI analysis and TCO are related in that they both use similar taxonomies for cost accounting. ROI differs from TCO in a number of ways as follows: a) TCO is an annual cost figure that is an average cost of ownership over a five year period, without regard to the benefits of owning or using the asset, while ROI looks at the implementation costs as they occur, and the derived benefits of the project, to tally the total positive and negative impacts of a planned project and its financial viability; b) ROI looks at only the categories of costs and benefits that directly relate to a project, while TCO is a full cost accounting of every aspect of IT; c) TCO is a good management tool for uncovering cost issues, while ROI is an essential tool for evaluating the costs and benefits of a planned project and at evaluating cost cutting measures.
"What-if" Factors	"What-if" factors allow the analyst to run different modeling scenarios quickly by increasing the costs and decreasing the benefits in total by a specified percentage. By using the "what-if" factors, project cost overruns can be simulated, while planned benefits can be reduced, to determine if the project still makes sense, and where the crossover point exists between positive return and negative benefits.

About the Author

Tom Pisello

Tom Pisello is a former Managing VP of Gartner, and the original innovator of automated ROI and TCO analysis tools for both IT solution providers and CIOs.

Currently, Tom is the founder and CEO of Alinean (www.alinean.com), pioneering developer of methodologies and tools to help improve the value and management of IT solutions through Value and ROI analysis. Alinean currently works with industry leaders such as Dell, HP, Intel, EMC, Compaq and others to help improve the buying, selling and performance management of IT.

Prior to Alinean, Tom serves as a start-up executive and consultant with several new economy companies including: Connotate Technologies (www.connotate.com), a Rutgers University start-up developing HTML to XML content mining tools; DigitalOwl (www.digitalowl.com), a pioneer of e-publishing software and services (a DraperAtlantic funded company); Full Armor Corporation (www.fullarmor.com), a pioneer of enterprise policy management for Windows platforms; and PuertaBella.com - award winning e-tailer of imported home décor.

Tom's work in TCO, ROI and value began in 1994 as founder and CEO of Interpose, the original pioneer of ROI and TCO tools. Interpose had the pleasure of working with Microsoft, IBM, HP, Intel, Compaq, Dell and dozens of other leading IT solution providers on ROI and TCO methodologies and tools, earning Tom the nickname, Godfather of TCO. In 1998, Interpose was successfully sold to the GartnerGroup. With the GartnerGroup, Tom served as Managing Vice President of Software Tools, integrating the business to become one of Gartner's most successful acquisitions, with over $20 million in second year annual revenue.

Prior to Interpose, Tom held key business development, project director, and development management roles with Conner Peripherals (now Veritas) and Logicon. Tom holds a B.S. in Electrical Engineering from the State University of New York at Buffalo (Cum Laude), and a Management degree from Rollins College, Winter Park, Florida. He holds five software patents, has been a speaker at COMDEX, Gartner Symposium, Gartner TCO Conference and Red Herring's Venture Market South, and written feature articles for leading information technology magazines and journals.

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