IT Value Chain Management –
Maximizing the ROI from IT Investments

Performance metrics and management methodologies
every IT stakeholder should know

By Thomas Pisello
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Preface

Have we received value from our IT investments? Most people answer “Yes, of course - IT value can be seen everywhere.”

Professional’s computer systems enable them to access, analyze, communicate, and share information efficiently, as well as compose documents and produce presentations. They are connected when they travel and can work at home as if they were in the office. The increase in IT use has not only changed how the individual works but how entire departments work. Finance has been automated to simplify strategic planning, better manage projects, automate payroll and incentive management, optimize cash management and make accounting closes more efficient. The supply chain has been streamlined to reengineer how we order and manage inventory – eliminating inventory and production issues and paperwork. The HR systems are computerized to streamline recruiting, hiring, performance management and training. Customer relationship management has been implemented to reduce sales cycles, increase selling effectiveness and improve customer interactions. Indeed, IT can be seen everywhere, but is this pervasiveness equal to “value”?

It would be difficult to argue that the benefits of IT are apparent on a personal and/or individual project basis, but has there been an overall impact to the corporate bottom-line from IT spending? Have the benefits outweighed the costs? If Value is being achieved, it should be measurable. If there is a return on investment in IT, the results should be measurable in the corporate financials. The results from IT spending should be recognized as enhanced output from less input – a more productive system empowered by IT investments.

Unfortunately, as we analyze our database of 10,000 public companies worldwide, and compare IT spending (the input) against a multitude of corporate benefits (the output), the results are random.1 Companies that spent more than average on IT versus companies that spent less than average on IT where likely to perform equally well. The bottom-line - IT spending alone did not deliver superior returns. Over the past ten years, the analysis of IT spending has consistently shown that it is not how much you spend on IT, but what you buy and how the IT is managed.

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1 Performance measures included corporate financial results such as net profit, economic value add (EVA), return on equity, return on assets, and shareholder value.
As the CFO and board take aim at IT spending, particularly post-bubble, will your organization pass the test? If you are one of the companies that have performed well from your IT spending, it is imperative that you implement a system whereby these returns can be quantified and communicated. If you are one of the companies that have invested heavily with little to show for your efforts, it is time to take control over return on investment planning – before the lack of results takes control of you.

If you are a solution provider, it is imperative that investments in your solutions deliver bottom-line returns, and that you have a system in place to quantify benefits pre-sale in order to obtain the business, and even more important, to collaborate with the client and assure benefits post-sale.

The next wave is less about innovation and more about the maturation of IT investments - the era of IT accountability.

This book is written to help all IT stakeholders - project managers and business unit leaders, IT executives and CIOs, CFOs and board members, as well as consultants and solution providers – better understand the issues regarding the realization of IT value, and provide the basic tools for quantifying, communicating and assuring superior returns from IT investments.
Section I – IT Spending and Financial Justification

The IT arms race is over and economic criteria are now the benchmark for IT investment decisions. It's not how much you spend, but what you invest in and how well it is managed that counts.

Information Technology (IT) changed dramatically in 2001, where spending euphoria was quickly replaced with frugality. Leading up to this period was an unprecedented flurry of IT spending - a technology funding and investment wave fueled by the looming year 2000 issue and the new economy based on the Internet and everything “e”.

In an effort to make sure a company was not “out-Amazoned” and to bolster lofty valuations of new economy business models, CIOs invested heavily in e-business solutions and infrastructure. These investments, coupled with spending to address year 2000 issues, information technology spending rose by 9.4% in 1999 and 11.1% in 2000. As a result of this spending boom, U.S. businesses devoted almost 47% of all capital spending in 2001, or $664 billion, to IT. That percentage is twice what it was in ten years earlier in 1991. Pundits warned that if this growth rate continued, IT spending would overwhelm all other investment needs and diminish the availability of funds needed to cope with, say, a possible energy crisis, heightened security demands, or increased global competition.

In 2000, capital spending for computer and network hardware alone exceeded investments made in every other major economic sector. Worse, each dollar spent on these IT assets typically requires another $4 in labor costs to manage, support, and maintain the technology. This means that IT spending totaled over $2 trillion worldwide in the year 2000, twice the total of all corporate profits.

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² Research by IDC as reported in Business Week, December 17, 2001

³ Source: Bureau of Economic Analysis, Table 5.5. Real Private Fixed Investment by Type, [Billions of chained (1996) dollars], December 21, 2001,
Section 1 – IT Spending and Financial Justification

Figure 1: 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.

If IT’s growth rate had continued unheeded, spending would have grown four times faster than the recent rise in the gross domestic product. Even if IT budgets were to maintain the same share of investment funds as they did in 2000, the value of computing relative to everything else would continue to explode. The economy would be plowing its capital surpluses to keep the technology engine running; which would dwarf the worth of every other capital investment such as real estate, transportation equipment and energy exploration.

The capital marketplace recognized the problem with spending too much on IT and in 2000, overall US spending contracted suddenly over 10%. Although many analyst firms such as Gartner and Giga Information Group predicted rebounds of 4% to 5% growth in 2002, most corporations continued to hold the line on IT spending – causing an estimated additional 5-10% contraction in overall IT spending. The recovery predictions continue to slide into late 2003 and early 2004, but regardless, most understand that as a result of the spending frenzy of the 90s, we have entered a new period of scrutiny and accountability.

**IT Spending and Performance**

The budget battle is on. CFOs are ready to wreck havoc on the CIO’s budget plans unless the CIO has the ammunition to fight back.

On average, the highest performers today are indeed the most frugal, but the lower performers are also under- spenders compared to the averages. What does this mean? Setting spending levels based on industry averages is nonsense.

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

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4 Research on the macroeconomics of IT spending and Information Economics by Paul Strassmann
years ago. Who imagined instant messaging colleagues and friends, ordering from online catalogs, viewing streaming videos of breaking news anywhere in the world, or managing your own stock portfolio online like a professional? As business people, we proactively obtain news that matches our interests; stay completely connected during travel or telecommute; collaborate with teams worldwide using e-mail, instant messaging, and online conferencing; access key business information; create complex analytical reports; build professional multi-media presentations; and self-publish e-books. Few would argue that as knowledge workers, we now have the ability to create, connect, communicate, collaborate, and produce at our convenience.

So this productivity should be easily measurable in the corporate bottom-line – right? Unfortunately, studies continue to indicate that although individual productivity has improved, when taken in total, corporations have somehow squandered the gains. When you run the numbers, there is no correlation between investment in IT and profitability, or other key measures of business success.

Although some companies achieve spectacular results using IT by shaking industry business models (Dell), creating new industries (eBay), and providing more for less (Wal-Mart); statistically, higher investment in IT does not correlate with measurable bottom-line value or any number of other measures of corporate success. The correlation between IT spending and value is random.

A 2001 study by management consultancy McKinsey analyzed the impact of IT spending on productivity. They used 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 that there was little correlation between IT spending and derived value. The results showed:

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 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.  

Examining the performance and IT spending of over 10,000 companies worldwide reveals that there is little correlation between IT spending and superior performance in return on equity, return on assets, profitability or shareholder value.

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 a positive return on equity at all. Companies that had low IT expenditures per employee were just as likely to achieve positive returns on equity as those with high IT spending per employee.

On average IT spending was analyzed to be $10,280 per employee; a total of 3.7 percent of revenue.

Some of the findings from this analysis include:

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5 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 average the performance amongst those that deployed technology well, and those that spent much money but are mismanaging the investments; 2) Financial reports not

6 Using Alinean Peer Comparison software v2.5
Among the most ‘frugal’ industries, those with lower IT spending than the database average include: aerospace and defense, agriculture, automotive manufacturing, construction, lumber and furniture manufacturing, mining, paper manufacturing, steel manufacturing and transportation.

Among the most ‘aggressive’ investors, those with IT spending above the database average: financial and banking, publishing and information services, pharmaceutical, lifestyle and luxury brands, emerging airlines and transportation and logistics companies.

Large companies definitely tend to get some economy of scale benefits in their IT spending than their small and mid-sized industry counterparts.

But within these averages, there is a broad range of spending based on a complex confluence of industry, business model, product lifecycles, economic and geo-political climates, company size, location and best practices, and that in many instances, being the most frugal is not always the best. From our analysis, higher performance is consistently based on how well the investments are managed, not how much is spent.

![IT Spending / Employee](image)

Figure 5: IT spending per employee for average, best performing and worst performing firms from the Alinean database of 10,000 US and international firms. Performance was measured based on return on equity, return on assets, profitability, revenue growth and shareholder value rankings. The results indicate that in this current economic environment, some of the best firms currently also happen to be some of the most frugal, on average. However, the lowest performing firms also under-spend the average. This view of average spending indicates its weakness as a management tool for CIOs and highlights how a more detailed analysis of actual spending and performance with selected peers is needed to assess spending levels and develop sound strategic plans.
Is the initial analysis missing some of the benefits of technology that may be hidden? In this next section we examine the common reasons provided for IT investments and determine whether the benefits have truly been realized.

**Does IT Matter?**

*In general, the beneficiary of IT investments has been the larger corporation who has managed their investment well, the small / medium sized business who have been given more opportunities than ever before to compete, and the consumer who now have more availability and choices at lower prices than ever before.*

*Regardless of overall random correlation between spending and returns, companies who invest wisely and manage these investments for maximum returns have indeed reaped the rewards that technology can deliver.*

*As we transition into the next wave, new methods to deploy low risk/high reward technology, coupled with enormous emerging marketplace opportunities such as China and India, present the greatest opportunity for technology savvy innovators.*

If the benefits of the demonstrable applications of information technologies are examined in isolation, they represent enormous gains in productivity and consumer satisfaction that should have generated equally huge gains in profits. Unfortunately, the overall statistics bear that improvements in productivity did not materialize.

There is little doubt that consumers benefited from improved turnaround in processing routine business transactions, which also caused a remarkable improvement in consumer services. Now, the consumer has more control regarding selection, availability, options and pricing. Knowledge workers have also benefited due to new personal productivity tools, electronic publishing, and untethered connectivity.

As the prior section highlighted the overall statistics indicate that there is no correlation between IT spending and value. In over half of the companies, IT has not had the anticipated impact - where IT spending has fundamentally impacted the bottom line.

Has IT made a difference and does IT spending matter? Many would say that it does not, and put forth various assertions to back their beliefs, and worse, cause decisions that will clearly place certain companies and their executives at risk.
Why IT Matters

As the basics become commoditized the competitive playing field moves to a higher plane. IT can be viewed as a hierarchy of needs much like Maslow’s hierarchy of needs model for human development.

Competitive advantage has progressed from those who know how to implement the technology, to those who know how to apply technology to improve business processes, to those who know how to use it to share, manage and grow knowledge.

If one examines basic IT infrastructure, the marketplace of computers, printers and networks have become commodities with uniform products and little pricing power. It is certainly true that Wintel Desktops and IP networks have rapidly evolved into widespread use – clearly resembling a commodity. As well, personal productivity applications such as word processing, e-mail and messaging could be considered commodities. Network servers, storage and printers have moved towards commoditization as well. As such, since IT is a commodity, it does not matter as much too competitive advantage and bottom-line impact, right?

Not exactly. As computing infrastructure has moved towards commoditization, clearly the entire IT marketplace has not commoditized. IT solutions are evolving from basic infrastructure, through business process optimization and information management. After examining this progression, a model emerged that likened the IT marketplace to Maslow’s hierarchy of needs.

The well traveled theory by Abraham Maslow asserts that people are motivated by unsatisfied needs, and that certain lower needs are the initial focus and may require satisfaction before higher needs are addressed. Lower needs include physiological such as air, water, food, and sleep, and safety includes needs such as security of a home and family. Higher needs include, in order, Love, Self Esteem and Self Actualization. When each of these needs in turn are satisfied, from lower to higher, new (and still higher) needs emerge, and so on.

![Maslow's hierarchy of needs](image)

The theory has been extended from human behavior to economics, whereby marketplaces need to have lower needs met, before the demand for higher needs arise. For example, a third world economy focuses on the lowest needs first – basic human survival. Until this can be resolved, whereby people have the water and food they need, the next highest need, the safety of home and family, is not an issue. For first world countries, the lower needs are viewed as commonplace
commodities, while the focus moves towards meeting higher end needs of home, transportation, careers, vacations, hobbies and spiritual fulfillment.

If we match IT investments with Maslow’s hierarchy of needs, a new understanding can be developed which proves that the basic levels of IT have been met, and indeed have commoditized. And the hierarchy clearly proves that IT has not commoditized and instead we have just moved the playing field to a higher plane where the investments are substantial, innovative, and crucial for competitive corporate success.

Figure 13: The Alinean IT Hierarchy of Needs highlights the progression of IT investment’s focus from the acquisition of computing assets through knowledge capital management and beyond.

To model this evolution, we have created the IT hierarchy of needs, a four level investment and marketplace progression. This hierarchy helps to illustrate that as each successive capability is met, the competitive advantage progresses from those who know how to implement the technology, to those who know how to apply the technology to improve business processes, to those who know how to use it to share, manage, and grow knowledge.

- **Level 1 – Computing Infrastructure**: The prior era of IT has been focused on fulfilling the basic lower end needs – the quick deployment of the assets and infrastructure needed for computerization. Investments were implemented to deliver individual and corporate productivity, helping users get their work done more efficiently, and helping to reduce overhead. This included trillions of dollars of investments to implement data centers, networks, personal computers and personal / business applications. With this infrastructure in place, the corporation was free to move to a higher need, and as a result, the marketplace now views these assets as commodities.

- **Level 2 – The Internet and Enterprise Software**: With the advent of the Internet and enterprise software, the battlefield moved up-stream – delivering productivity improvements beyond the corporation and to the entire value-chain. These investments allowed customers and the supply chain to effectively integrate into corporate computerization, and helped to improve the efficiency and effectiveness of these relationships through business process optimization. Again, with these needs being met as companies implement process by process improvements, efforts are being applied upwards to even loftier needs within the hierarchy. As a result, although the need is not yet completely fulfilled, markets have begun to commoditize, evidenced by the recent consolidations in the ERP space.
- **Level 3 – Knowledge Capital Management**: The newest battleground focuses on the “I” in IT – the information, not the technology. IT innovation is soon to be focused more on providing the primary means for maintaining and extending the value of a firm’s “Knowledge Capital”. IT investments are migrating from basic infrastructure, through transaction optimization, to being primarily focused on managing the rapidly exploding accumulation of scientific, research, customer, engineering, property and intellectual assets. Computers are the repositories of intelligence about customers, suppliers and products, the most valuable knowledge assets of any firm. Emerging solutions include data warehouses, enterprise portals, analytics and business intelligence – which are moving towards mainstream adoption, but clearly have not reached commoditization. The company that is able to collect and apply such knowledge to effect bottom-line impact is the likely winner over the next decade.

- **Level 4 – Information Warfare**: Once the basics of knowledge capital management is covered, the focus moves still higher from reactive analysis to information, to proactive control of the information as a competitive weapon, Level 4 is the futuristic era of information warfare for corporations. This battlefield is rather ambiguous at this point, and takes its lead from military research and application – but clearly a corporate analogy to the current military shift from conventional to information warfare will occur. The focus of information warfare will be the use of information distortion or denial, and the countermeasures to fight such attacks. Several expected components include: Hacker Warfare – where computer systems are attacked, Psychological Warfare – where information is used to change the minds of friends, neutrals and foes, and Economic Information warfare – blocking information or channeling to pursue economic dominance. Information command and control systems, strategy and counterstrategies and business intelligence are the tools not yet developed to meet level 4 needs.

The IT hierarchy of needs can help companies understand how to categorize various investments – and how to assess what is most important to solution decision making. As the hierarchy of needs clearly dictates, for the fundamental needs that have already been met, the markets have commoditized, and solutions with the lowest total cost of ownership win. As capability is met, investments naturally progress to the next level – where innovation still reigns, value versus costs matters most, and competitive differentiation can be gained with the right projects and spending plans.

Indeed, IT does matter. The laggard who thinks that IT has reached the end of its usefulness will inhibit the corporations most innovative and reliable value-creation means now available for increasing the economic benefits for enterprises and customers. As we enter the next wave of economic growth IT will play an even more vital role in company success, bottom-line impact, and market capitalization.

That being said, corporations need to be smarter – as the margin for error has declined. 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. Information technology executives and their vendors will have to devote as much time communicating verifiable business benefits as promoting technological innovation.

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1 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.
Critical Success: CIOs becoming Business Leaders verses Cost Managers

Investments should not be a constant percentage of revenue, or a set amount per employee but should ebb and flow with the changing tides of the economy, strategic initiatives, markets, products and competitive threats.

When the next wave comes, staying the frugal course can lead to missing the wave. As well, the habitual spenders would be well served by some self constraint – it can’t be a technology party 24x7.

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](image)

Figure 14: 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 time on operational efficiency, rather than on the marketplace and competitive advantage that can be delivered by the technology?

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

1. CIOs are underwhelmed with a budget that leaves little room for innovation and overwhelmed by the management and support tasks of the installed base.
2. CIOs have been promoted more often to date because they are good managers of the technology, rather than because of their business leadership skills.
3. The organization continues to view IT as a cost center rather than a profit vehicle.
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? More and more investment decisions and benefit management is being driven by the business units and not IT. Recent studies by Gartner and other analysts highlight that the business unit IT budgets are growing and are now the dominant arbiters of IT spending decisions. The lack of IT aligning their strategy for business and competitive gain perpetuates the view of IT as a cost center and not a strategic advantage for the company. Many CIOs act more as CTOs developing the technology architecture to support the business applications and process improvements, rather than as a change catalyst and strategic manager. IT executives are viewed in many organizations as plumbers, installing necessary infrastructure, and fixing leaks.

To help end the computer paradox and derive measurable profit gains from IT spending, CIOs need to become better business leaders, as opposed to superior technology managers. Leaders help the company attain sustainable competitive advantage, deliver better value to customers, pick a market segment in which they can win, and manage risks. They implement solutions based on fiscal prudence and improved bottom-line benefits rather than for the latest technology fad or an escalating arms race based on vendor and consultant advice. The bottom-line: the CIO needs to become the CFO of IT.

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<thead>
<tr>
<th>Characteristics of Value Leaders</th>
<th>Criteria / Actions for Success</th>
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<tbody>
<tr>
<td>Market Position</td>
<td>65% of companies success related to market position</td>
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<td></td>
<td>Monitoring of competitive positioning as a key success criteria</td>
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<td>Deriving strategic and tactical plans based on competitive advantage initiatives</td>
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<td>Prudent</td>
<td>Strong project selection committees with fiscal discipline</td>
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<td>Modest new project budgets</td>
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<td>Self service to reduce administrative overhead</td>
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<td>Standardization and consolidation</td>
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<td>Agility: Able to scale spending to performance/market conditions quickly</td>
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<td>Accountability</td>
<td>Smaller projects with more milestones</td>
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<td></td>
<td>Strategic alignment, planning and benchmark measurement</td>
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<td>Portfolio Management, ROI, TCO and Value management discipline</td>
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<td>Strong business unit collaboration</td>
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<td>Focus</td>
<td>Strategic outsourcing</td>
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<td>Higher training and career development spending</td>
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<td></td>
<td>Lower staff turn-over, satisfied employees</td>
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<tr>
<td></td>
<td>Core culture and mission with strong visionary leadership</td>
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Figure 16: Characteristics of Value Leaders outlines common traits that tend to lead to higher performance.
Unfortunately, because of the burdens of the installed base, lack of proper budget, and in some instances the lack of financial leadership skills and the ability to speak in the language of the CFO and other executives, the majority of CIOs remain operational managers.

In order to improve the value of IT, the next generation CIOs needs to solve not only the cost, but the benefit issues in order to succeed. As a result, we have three suggested elements of attack:

Corporations should seek to install business-oriented IT leaders to supplement more operationally-focused CIOs. Usually, the best leadership comes from a combination of resources, which often cannot be found in the same person – visionary leadership, business sense and operational 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.

Corporations should put in place a collaborative platform of project portfolio management, a system to track all projects and resources, and most importantly to plan and monitor risk and reward, competitive positioning, return on investment and bottom-line corporate impact.

Corporations should seek vendor partners who can deliver services that allow the budget and resources to be freed for innovation, and who are accountable not just for technical competence and service level competence, but on realizable return on investment.

**Managing IT for Performance Not Cost**

*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.*

*Survey some of the leading companies about the value they've derived from their IT investments and its obvious that even though the overall relationship between value and spending is random, serious money can be made in IT*

As the computer paradox highlights, IT spending and performance are random. 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 executives to justify continued investments without proof of returns.

A company that spends wisely - even if sparsely - on IT, will see its performance enhanced more so than a company with little investment discipline and poor ROI management. A company that spends indiscriminately on IT, regardless of their spending levels, will see its performance diminished, because IT will merely amplify its poor business practices.

What are the issues for solution providers? Unfortunately, most IT solution providers act like arms brokers, selling the latest, greatest hardware to one country and 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.

What are the prospects for CIOs? Budgets already under intense pressure will come under additional scrutiny. Because most of the low hanging fruit has already been rung from the budgets, CIOs will be faced with tougher and tougher decisions. High profile reports have corporate executives wondering where the value was in all the IT investments. Backlogs of projects are growing and business units, users, and customers are un-ending in their demands. Desperate vendors and analysts
continue to push expectations. CIOs will attempt to counter the pressure without the tools to do so effectively.

![Pie chart showing the distribution of increased, decreased, and remained the same for 80%, 17%, and 3% respectively.]

**Figure 17:** 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

As IT budgets tighten, it is imperative that IT stakeholders speak clearly and effectively of the ROI derived from their IT investments. In a study by Ernst and Young in 2002, financial justification was clearly indicated as important, BUT it is not always being done: although 79% of respondents rate financial justification as important, surprisingly only 40% perform a financial business case analysis on a regular basis.

What is the reason for this shortfall? A study by ComputerWorld of their Premier 100 in the summer of 2002 indicated that: 65% of companies do not have the knowledge or tools needed to do ROI calculations; 75% have no formal processes or budgets in place for measuring the ROI of IT projects; and 68% do not measure ROI on IT projects 6 months after the work is completed. Although investment success clearly relies on better management, the current stakeholders seem ill equipped and supported to meet these new accountability challenges.

![Pie chart showing the distribution of formal, informal, and combination of formal and informal measurement for 30%, 24%, and 35% respectively.]

**Figure 18:** Only 24% of surveyed companies have implemented a formal system for measuring payback. - Information Week ROI Study of 200 IT professionals, 2001

**Vendor Challenges**

*Businesses are clearly shifting the risk to vendors, holding them accountable not only for availability, security and performance, but for real business results. The solution providers who step up to maximize returns and minimize risk with proven results will be the winners.*

*IT solution providers have an opportunity to redefine the playing field with guaranteed ROI.*
With tighter budgets, IT solution providers 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, and that the spoils will come to the vendors who are accountable to these gains both pre and post sales!

In a study by Ernst and Young in 2002, vendor ROI was determined to be an essential part of the decision making process, but is coming up short compared to CIO requirements. In this survey:

- 81% of buyers expect IT vendors to quantify value proposition of proposed solutions
- 61% of buyers rate vendor’s ability to quantify their value proposition as important in the vendor selection process
- Over 50% of buyers use ROI to validate their own analysis and as a way to screen vendors

Yet there is little objectivity, commitment, accountability and trust for a majority of programs:

- Only 2% of buyers say vendors are exceeding their expectations on quantifying value proposition
- Only 2% of buyers have a high degree of trust in the vendor provided numbers
- Over 50% of buyers indicate that 3rd party objectivity and improved quality of tools / presentations would enhance trust in vendor ROI

As indicated, vendors play a crucial role in the current ROI and budgeting process, but should not be the drivers of such initiatives, as has been the case with many organizations who do not have the skills and time themselves to do the financial due diligence. In a survey by the Yankee Group in 2002, 35% of new IT projects were not approved by management because they had a poor business case and an additional 25% because they did not show value. Vendors clearly can’t leave ROI to chance, and need to mature initiatives in order to shorten the sales cycle and improve selling effectiveness.

Collaboration by CIOs with vendors who are committed to accountability is important, but total reliance on these same vendors has the wolf guarding the hen-house.

**CIOs Demand Vendors “Get Real on ROI”**

CIOs face a catch-22 when evaluating new IT investments: Quantifying the ROI of proposed projects is being mandated, yet the IT staff is already stretched thin by managing day-to-day operations. Meanwhile, CFOs are holding budgets tight, in part, because past projects may have fallen short of expectations.

As a result of this circular problem, more than 80 percent of IT buyers now rely on vendors to help them quantify the value proposition of solutions. In fact, many CIOs now elevate the ability of a vendor to proactively justify their solutions to one of the top five most important selection criteria.

Yet CIOs remain skeptical – based on years of ROI business cases with magical 1000 percent-plus returns, immediate payback periods, drastic overestimation of benefits and underestimation of real costs to implement and own the solution. As a result, fewer than five percent of buyers say vendors succeed at quantifying their value propositions, and fewer still find vendors’ analysis credible.
How can vendors step up and meet CIOs’ requirements for credible ROI?

- **Set the stage**  
  First, strive to minimize up-front analysis time, even while driving a quick, yet thorough, business case to help the team pinpoint and communicate the value of proceeding. The more credible this preliminary analysis, the more likely the CIO will green-light due diligence.

- **Get things started with good research**  
  Start the analysis with industry research scaled to match the company. Use third-party information to established customized industry-standard costs, and to ensure that the team’s initial analysis is both credible and accurate. Leverage third-party data.

- **Justify and document the cost and benefit assumptions**  
  Thoroughly document these industry costs, often known as ‘defaults.’ Then estimate the organization’s “as-is” costs – those prior to project implementation – to include how those defaults are customized and what research forms the basis any modifications. Next, document all benefits to include new features, key performance indicators and the source of savings.

- **Allow no stone to be unturned**  
  Document and simplify key calculations so all stakeholders can easily understand projected results. Equally important, the CIO must be able to modify defaults to further customize the business case, and adjust anticipated savings and costs.

- **Include strategic benefits**  
  Projects may be implemented for specific financial benefit. Some projects are strategic – undertaken specifically to improve future performance. C-level executives rank strategic or intangible benefits as equal to or more important than projects that focus primarily on hard-dollar cost-savings.

- **Scale the analysis using realized benefits and project risks**  
  Business cases often underestimate costs and overestimate benefits. One cure is to scale the business case results with an eye towards project risk; another is to scale back the anticipated bottom-line contribution of soft, or indirect, benefits. One common gauge is to discount these benefits 10-to-40 percent of their original value.

- **Pass the “sniff test”**  
  If the business case is unrealistic, it will not pass a board of directors’ review, and may damage the entire team’s credibility. Document how promised results are already risk-adjusted and the benefits are well within reach.

- **Commit to the partnership with an ROI SLA**  
  An ROI service level agreement establishes target ROI and key performance indicators, against which the team tracks progress. A portion of a vendor’s compensation can be based on meeting key performance metrics. This reduces the customer’s risk, and underscores the vendor’s commitment to success.

For the vendor, a cost-justification report and business case increases the likelihood of a project’s approval by 60 percent and reduces the sales cycle by 30-40 percent, according to IDC, the research firm. Strategically, providing this detailed ROI analysis gives CIOs a vendor who is also a partner, committed to the realization of promised value – reducing risks, increasing rewards and improving the bottom-line.
ROI Service Level Agreements: The Future of Vendor / CIO Relations

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.

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 and will eventually become a reality in business.

The service level agreement of the future will involve the IT vendor helping the client 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 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.

Figure 19: 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.
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 the project is delivering as promised. However, few business unit managers 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 for a solution provider that truly delivers.

![Chart showing compensation types]

*Figure 20: If a vendor fails to deliver on service level guarantees, the majority would like to receive lost revenue compensation and a fixed cash reimbursement.*

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 toward shared risk and reward in major IT projects. Realistically however, it is predicted that today’s status quos will remain: IT solution providers will not move to such a risky and non-visible business model of shared benefits. If IT solution providers are willing to share, corporations will need to find direct or indirect ways to share the wealth on successful project.

**CIO Challenges**

*Businesses are done with mere technology. From now on, the role of the CIO is to make money.*

*CIOs need to stop begging for budget dollars, and instead start showing measurable value.*

During the last wave of IT growth and investment, overabundance of capital and business fervor forced CIO’s to make spending decisions to meet year 2000 repairs, infrastructure and “e”-innovation demands. In early 2000, the decision 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 those that are selected need to provide quantifiable returns before a commitment is made.

In this new environment, the CIO is facing three challenges in preparing and justifying project plans and budgets:
1. **Prove and improve the Value of IT** – Since the majority of IT project investments over the past five years have not met expectations and with over two-third not meeting budget, schedule, and/or requirement goals, CIOs are being held to a new level of accountability and are suffering a crisis of credibility.8 CIOs are under pressure to immediately deliver bottom-line impact, helping to decrease corporate expenses, and hold steady or reduce the IT budget in spite of increasing demand.

2. **Do more with less** – Recent surveys indicate that the demand for IT projects is still increasing, but the budget growth to meet the increasing demands are no longer available, and as a result, CIOs need to be able to accomplish more with less resources and funding. However, CIOs were already squeezed on their spending allocation even before the budget crisis. In 2001, a meager 10% of the IT budget was being spent on innovative projects, while operations, maintenance, upgrades, and migrations consumed 90% of the budget (Source: Alinean). CIOs will be even more challenged over the next several years to continue to drive business value, while consolidating existing operations to reduce costs.

3. **Communicate more effectively** - In a 2002 survey among 400+ top IT executives, 60% reported an increase in the level of pressure to prove ROI on IT investments. But 70% believe their metrics do not fully capture the value of IT, and nearly half lack confidence in their ability to accurately calculate ROI on IT investments9. As a result, many CIOs have difficulty communicating the financial impact of IT and the decision making criteria on project selections to business unit executives, CFOs, CEOs, and the board of directors. Few CIOs are able to consistently demonstrate how previous IT investments are delivering results, what the value is from the current IT spending levels, and why certain proposed projects and not others are being selected.

![A survey on IT management of 130 senior IT executives found that:](image)

- 51% have no process to evaluate IT investment against business strategy,
- 68% don't compare an IT project's benefits to original targets,
- 74% don't track financial metrics after making an investment decision,
- 80% say lack of financial skills makes quantifying IT benefits difficult

**Figure 21: I.T. Staffs Lack Financial Chops For Project Analysis, 03/24/2003, By Eric Chabrow, InformationWeek**

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8 Standish Group, the Chaos Report, 2001

9 T.A. Kirkpatrick. Research: CIOs Speak on ROI. CIO Insight, March 2002
CIOs are quickly recognizing the demands of their changing role in the business. A recent GartnerEXP survey of CIOs and IT executives indicates that the top 4 out of 5 goals are related to IT investment strategies, focusing on aligning IT with business/strategic goals, communicating and collaborating more effectively on plans, demonstrating the business value of IT, and reducing total costs.

**Top IT Management Priorities for CIOs**

1. Providing IT guidance to senior corporate executives
2. Demonstrating the business value of IT
3. Improving the internal governance of IT operations
4. Taking steps to reduce total IT costs
5. Developing or enhancing corporate IT architectures

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**Figure 22:** Do You Have Any Faith In Your ROI Numbers? 03/17/2003, By Allan E. Alter, CIO Insight

A survey of 375 CIOs and IT executives found that:

- 75% of IT executives say their metrics don't fully capture the business value of their IT projects,
- 76% of IT execs believe the pressure to measure intangible benefits has increased
- 73% of CIOs don't calculate ROI on projects after they're completed
- 70% of companies find it difficult to calculate ROI

**Figure 23:** Gartner survey of 620 leading IT executives worldwide, 200 indicates that 4 out of the top 5 priorities for 2003 are focused on information economics.
Section 2: IT Value Chain Management – Maximizing the ROI and Value from IT Investments

Because one of the challenges with the IT team is lack of financial acumen, the challenge is to implement a methodology that all stakeholders can collaborate on without needing a Masters in Finance.

There is no single metric that an organization can use to measure the value from IT – but it can be done with a manageable collection of performance assessments and metrics.

The "technology CIO" is on the lowest rung of the ladder and controls 3% or less of the company’s total budget – basically direct spending for IT people and gear, he says. Next comes the "information resources CIO," who controls not only technology spending but also spending on information resources generally, perhaps 30% of the budget. At the top sits the "information strategy CIO," who ultimately has some influence over 100% of the budget.

The changing role is forcing CIOs and IT Executives to implement strategies that enable them to better manage what investments are made and assure that predicted bottom-line impact is realized. Everyone is looking for the silver bullet – the one metric or value that will measure and maximize the value of IT. Just as there is no single measure on the health of the economy, or for corporate performance from micro to macro-economic, there is no single measure for IT spending and performance. It takes a collection of measurements and assessments to measure the current spending and performance, assess success, and plan for the future.

To help the CIO prove and improve the value of IT, do more with less, and communicate more effectively, we have created IT Value Chain Management. This methodology and framework seeks to impart a measurement system for each phase of the budgeting and planning process, helping IT executives analyze, optimize, and manage the business impact of IT: from the micro-economic impact of an individual project, to the macro-economic impact on overall business performance. The IT Value Chain Management methodology provides a collaboration framework for all Stakeholders who are involved in IT investment decisions, and in the realization of value from these investments:

- Vendors and Consultants, Project and Business Unit Managers collaborating on individual business process improvements and IT projects, to,
- Cx level executives and Directors who must review the risks and rewards of proposed portfolios of solutions,
- Shareholders, Customers and Supply Chain Partners who continually assess their relationship with the company and other competitors.

This methodology imparts a practical regimen and perspective on portfolio management strategies and tools.

The IT Value Chain Management process consists of several steps for analysis, measurement and decision support of IT investments. These steps are typically not performed in order, but are part of an on-going value management lifecycle, which is repeated at various times throughout the year, as new project proposals are analyzed, project risks and success are measured, budget/planning reviews are conducted, and strategic progress and market position is assessed. In some instances, the team will start with a top-down approach with, starting with step 4 first - Competitive Peer Comparison.
fist prior to performing Step 1 – a Project ROI. Other times, the team will perform a bottom-up analysis, progressing from Step 1 in order.

![IT Value Chain Management](image)

Figure 24: CIOs are responsible for IT Value Chain Management, proving and improving the value of IT to the business, and across all IT stakeholders, from Project and Business Unit managers, to CxOs and Directors, to shareholders, customers and supply chain partners.

The IT Value Chain Management methodology four steps are as follows:

**Step 1: Project ROI** – In many organizations dozens if not hundreds of proposals for various projects are made each year. Some of these proposals are for modest migrations and upgrades, while others are for ambitious new applications and business innovations. The team needs a method to quickly assess the strategic impact, bottom-line effect, investment requirements, risks and rewards of each proposed project - a framework that provides the means for business unit managers, project managers, vendors and consultants to participate without having a financial background. A framework that is consistent and allows for apples to apples comparisons between competing investment plans – after all there are only so many resources and only so much capital to bear. The Project ROI step provides the framework for individual project assessment, and the subsequent capability to track the performance of the project against financial goals, risk mitigation and key performance indicators.

The Project ROI portion of the methodology collects information about the “As Is” opportunity – an analysis of the existing spending and processes. Against the “As Is” environment, the implementation of the project, and the planned benefits are simulated, to determine the change costs, and the “To Be” business processes. The Project ROI analyzes the cash flow of the project, including the change costs and the savings (the difference between the “As Is” and To Be environments). As well, Project ROI extends traditional cost benefit analysis to include risks and intangible benefits, both of which are essential in analyzing IT investments so as not to get too narrowly focused on the financial outcome without discounting the values for risk, or increasing the values for strategic impact and gain. With Project ROI, quantification is documented for future
accountability measurements, and for use in subsequent steps of IT Value Chain Management – IT budgeting and corporate financial impact.

**Step 2: Project Optimization and Budgeting** – Various groupings of individual proposed projects need to be assessed as to their collective impact on the IT budget. How will the proposed project portfolio impact capital and operating expenses, and how much staff resources need to be committed to implement and deploy the project successfully? How much of the investments are planned towards maintaining on-going operations, versus migrations, upgrades and innovation? How will the proposed project portfolio help to reduce on-going capital and operating expenses? All of these questions cannot be answered by any single individual project plan, but by determining the impact of the planned portfolio of projects on the “As Is” IT budget. The simulation from this IT Value Chain Management step allows the project plans to be modeled to determine the necessary IT budget, and to perform “what-if” analysis to assure that resources are available to implement the planned projects, risks are minimized, and rewards are maximized. With a documented budget plan in place as part of this step in the methodology, plans can be compared against actual performance to assure achievement accountability.

**Step 3: Corporate Financial Impact** – The project portfolio needs to be assessed as to its impact beyond just the IT budget. More importantly, the team needs to assess, communicate and track the impact of the portfolio on the corporate financials and on key performance indicators. Particularly, how will the project portfolio impact top line revenue and gross margin, reduce operating expenses, and maximize bottom-line net profits. First as part of this step in the methodology, the company’s “do-nothing” “As Is” financial plan is documented. The “do-nothing” plan represents the base corporate financials should the company remain status quo with little to no investments. Mapping the individual impact of each cost and benefit of the individual projects against the corporation’s “As Is” plan, produces a “To Be” simulation. Using this step, various combinations of projects, risks and rewards can be simulated to best meet corporate financial and strategic initiatives, and meet competitive performance goals. Tying the IT plans to corporate impact helps with budget reviews and approvals with executives, because it turns the IT centric plan into the language of corporate finance and performance. Most importantly, many project plans overstate their potential impact; however, once projects are grouped together, and the costs and benefits tied to corporate financial performance, the simulation quickly highlights unrealistic goals, and these plans tend to become more conservative and realistic – improving the credibility and accountability. This plan creates a clear measurable roadmap for the planned corporate impact of the IT plan, making performance measurement and assessment easier.

**Step 4: Peer Comparison** – Planning and budgeting without situational awareness is difficult, and needs to be performed relative to the competition. Plans made in relation to competitive positioning have a stronger chance for executive approval. The final step in IT Value Chain Management consists of performance assessments versus peers with regard to corporate financial performance, key performance indicators, IT spending, and total cost of ownership. This peer comparison analysis can provide vital information as to why certain results were not achieved (market conditions), whether the company is exceeding expectations or underperforming the competition. A competitive comparison of IT spending versus derived performance can help the team in tactical and strategic planning, and serve as an on-going report card as to the derived value of spending plans.
Step 1: Calculating the ROI of Planned Projects

Once the core team is convinced of the validity of a certain plan, ROI is a useful tool in rationalizing the decision to other stakeholders, and putting in place the measures for accountability.

Moving from lip service, to real measurement and management is the only way to resolve the ROI accountability issues.

Questions to Answer:

- What is the ROI and Value of each planned project?
- What are the project’s strategic benefits and potential risks?
- Which proposed projects have the best returns, highest strategic impact, and lowest risk?
- How can all stakeholders better collaborate, communicate and rationalize decisions more effectively?
- How can the team establish the key performance indicators for measuring progress and success?

The first step in managing the value of IT is to perform an ROI analysis of each planned project. Each project needs to be analyzed based on the following traditional ROI elements:

- Project costs
- Tangible benefits (those which can be quantified in monetary terms)

In addition to these traditional elements of an ROI cost-benefit analysis, we propose adding the following additional criteria in order to better assess IT investments (each of which will be discussed in more detail later):

- Intangible benefits (those which are strategic but are difficult to quantify in monetary terms)
- Project risks.

This ROI analysis is performed in order to determine whether the project is worthy of pursuit; to enable future tracking of progress and performance; and to compare various investment alternatives to determine which projects are the best for the company: contributing the most to achieving strategic and tactical goals while minimizing risk and investment requirements. By quantifying the
costs and benefits, the team has provided due diligence to the selection process, and has the tools to communicate and rationalize to stakeholders why the investment decision makes sense, or why the project is not worthy of pursuit.

**ValueMap™ – Where to apply projects to improve the business**

To help the team determine which projects to consider, and to help assure that investments are classified properly and diversified across various business processes, we have created the ValueMap. The ValueMap divides the business into its key components. Within each key component, a top level business process has been designated to further highlight key functions within the component. These business processes can be analyzed to determine the “As Is” process – the cost effectiveness and business efficiency of the current process. Key questions should be asked of the business process efficiency and effectiveness to determine if technology based reengineering can help to streamline the process, improve operating efficiency and optimize strategic business advantage.

Too often vendors dictate the discussion of which projects to implement, pitching the latest technology innovation. Rather than look at which technology project to consider, it is advised that the team work collaboratively with other internal stakeholders, vendors and consultants to examine each key business component, and then each business process within the component for opportunities.

**Alinean ValueMap™**

<table>
<thead>
<tr>
<th>Customer Relationship Mgmt</th>
<th>Product Lifecycle Mgmt</th>
<th>Supply Chain Mgmt</th>
<th>Strategic Mgmt</th>
<th>Financial Mgmt</th>
<th>Human Capital Mgmt</th>
<th>Intellectual Capital Mgmt</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target to Engage (Marketing)</td>
<td>Design to Deploy (Create)</td>
<td>Source to Settle (Procurement)</td>
<td>Plan to Act (Strategic Planning)</td>
<td>Record to Measure (Capture &amp; Report)</td>
<td>Attract to Onboard (Recruit and Hire)</td>
<td>Find to Act (Analyze)</td>
<td>Plan to Manage (Lifecycle)</td>
</tr>
<tr>
<td>Engage to Close (Sales)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Install to Maintain (Service)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Request to Resolve (Customer Support)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 26: As a part of the Project ROI process, the Alinean ValueMap™ lets users explore various business processes for potential improvement.

**Example Business Process Analysis of Engage to Close (Sales)**

A company would like to examine its Engage to Close (Sales) process to determine if CRM solutions can be applied to help improve the efficiency and effectiveness of selling. The following business processes and opportunities are analyzed as part of the process to identify key benefit areas, and key business metrics for improvement:
## Key Benefit Area

<table>
<thead>
<tr>
<th>Key Benefit Area</th>
<th>Key Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce Cost of Sales</td>
<td>Change the mix of direct sales, tele-sales, channel/agent sales and self service to reduce costs</td>
</tr>
<tr>
<td>Reduce Sales Administrative Overhead</td>
<td>Reduce the time spent on overhead tasks such as quota management, forecasting and reporting and increase selling time, particularly for sales managers</td>
</tr>
<tr>
<td>Reduce Sales Exceptions</td>
<td>Reduce order entry, product configuration and product availability errors – eliminating return/replacement costs</td>
</tr>
<tr>
<td>Improve Sales Effectiveness</td>
<td>Reduce sales cycles and improve product mix (higher revenue/higher margin products)</td>
</tr>
<tr>
<td>Increase Up-sell and Cross-sell</td>
<td>Increase current up-sell and cross-sell rates, revenue per sale, and margin.</td>
</tr>
<tr>
<td>Improve Leads to Sales Closure Rates</td>
<td>Increase the percentage of leads which are converted to sales</td>
</tr>
<tr>
<td>Increase New Channel Opportunities</td>
<td>Enable selling via a new channel such as on-line catalog sales</td>
</tr>
<tr>
<td>Improve Sales Staff Ramp-Up Time</td>
<td>Reduce the time it takes from new-hire to get a sales person or agent effectively selling</td>
</tr>
<tr>
<td>Improve Provisioning</td>
<td>Reduce the time it takes from order placement to service activation (subscription/ based services)</td>
</tr>
<tr>
<td>Reduce Bad Debt</td>
<td>Reduce the extending of credit to non-qualified customers, reducing bad debt write-downs/allocations</td>
</tr>
<tr>
<td>Improve Sales Staff and Agent Retention</td>
<td>Reduce the employee turnover or independent sales agent turnover, eliminating replacement/re-training costs</td>
</tr>
<tr>
<td>Improve Forecasting</td>
<td>Reduce excess inventory write-downs which are currently the result of inaccurate forecasting.</td>
</tr>
<tr>
<td>Increase Customer Retention</td>
<td>Reduce customer churn rate and eliminate replacement expenses</td>
</tr>
<tr>
<td>Improve Share of Wallet</td>
<td>Increase the share of spending for this company, compared to total spending on solutions in this area by the company</td>
</tr>
<tr>
<td>Improve Customer Satisfaction and Loyalty</td>
<td>Improve customer satisfaction, and in turn increase sales from this customer and referrals to new clients.</td>
</tr>
</tbody>
</table>

*Figure 27: The business process improvements in efficiency (costs) and effectiveness (revenue) of the Engage to Close (Sales) process.*

### Cost-Benefit Analysis

**Formal Definition:** Cost-Benefit Analysis is the method of measuring the benefits anticipated from a decision by determining the cost of the decision, then deciding whether the benefit outweighs the cost.

The first step in the quantification of the project is to perform a Cost-Benefit Analysis. In generic terms, ROI analysis usually refers to what is more properly represented as a cost-benefit analysis. Because of the popularity of the ROI reference, we typically use ROI analysis, or Project ROI to describe this step in the process.

For each of the business processes that require attention, the team should analyze the “As Is” efficiency (costs) and effectiveness (revenue). Against the current conditions, the cost and business impact of the planned technology solution is simulated to determine the project costs and “To Be” environment. The difference between the “As Is” and “To Be” environment are the tangible benefits.
Cost-Benefit Analysis = Base Case – Proposed Plan

= Cost and Benefits without Proposed Solution (AS IS) – Cost and Benefits with Proposed Solution (TO BE)

The Cost-Benefit Analysis, compares the project costs versus the projected benefits over time, analyzing the positive (benefits) and negative (costs) cash flows for the project.

Example: Cost-Benefit (ROI) Analysis

The company wishes to improve its Engage to Close (Sales) process by applying a CRM solution. The costs of the project are tallied, and the business process “AS IS” versus “TO BE: efficiency and effectiveness are analyzed. The summary is as follows:

<table>
<thead>
<tr>
<th>Project Costs</th>
<th>Initial</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td>$ 75,000</td>
<td>$ 75,000</td>
<td>$ 75,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Software</td>
<td>$ 325,000</td>
<td>$ 50,000</td>
<td>$ 50,000</td>
<td>$ 350,000</td>
<td></td>
</tr>
<tr>
<td>Implementation Labor</td>
<td>$ 75,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional Services</td>
<td>$ 150,000</td>
<td></td>
<td></td>
<td></td>
<td>$ 150,000</td>
</tr>
<tr>
<td>IT Training</td>
<td>$ 35,000</td>
<td>$ 75,000</td>
<td></td>
<td></td>
<td>$ 110,000</td>
</tr>
<tr>
<td>Application Customization</td>
<td>$ 175,000</td>
<td>$ 150,000</td>
<td>$ 150,000</td>
<td></td>
<td>$ 475,000</td>
</tr>
<tr>
<td>User Training</td>
<td>$ 75,000</td>
<td>$ 200,000</td>
<td></td>
<td></td>
<td>$ 275,000</td>
</tr>
<tr>
<td>Business Process Change</td>
<td>$ 120,000</td>
<td>$ 50,000</td>
<td>$ 50,000</td>
<td></td>
<td>$ 220,000</td>
</tr>
<tr>
<td>Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On-going Management and Support</td>
<td>$ 125,000</td>
<td>$ 75,000</td>
<td>$ 75,000</td>
<td></td>
<td>$ 275,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$ 435,000</td>
<td>$ 920,000</td>
<td>$ 325,000</td>
<td>$ 325,000</td>
<td>$ 2,005,000</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Tangible Benefits</th>
<th>Initial</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce Cost of Sales</td>
<td>$ 75,000</td>
<td>$ 90,000</td>
<td>$ 121,500</td>
<td></td>
<td>$ 286,500</td>
</tr>
<tr>
<td>Reduce Sales Administrative Overhead</td>
<td>$ 25,000</td>
<td>$ 30,000</td>
<td>$ 40,500</td>
<td></td>
<td>$ 95,500</td>
</tr>
<tr>
<td>Reduce Sales Exceptions</td>
<td>$ 55,000</td>
<td>$ 66,000</td>
<td>$ 89,100</td>
<td></td>
<td>$ 210,100</td>
</tr>
<tr>
<td>Improve Sales Effectiveness</td>
<td>$ 250,000</td>
<td>$ 300,000</td>
<td>$ 250,000</td>
<td></td>
<td>$ 955,000</td>
</tr>
<tr>
<td>Increase Up-sell and Cross-sell</td>
<td>$ 95,000</td>
<td>$ 114,000</td>
<td>$ 153,900</td>
<td></td>
<td>$ 362,900</td>
</tr>
<tr>
<td>Improve Leads to Sales Closure Rates</td>
<td>$ 120,000</td>
<td>$ 144,000</td>
<td>$ 194,400</td>
<td></td>
<td>$ 458,400</td>
</tr>
<tr>
<td>Increase New Channel Opportunities</td>
<td>$ 225,000</td>
<td>$ 270,000</td>
<td>$ 364,500</td>
<td></td>
<td>$ 859,500</td>
</tr>
<tr>
<td>Improve Sales Staff Ramp-Up Time</td>
<td>$ 50,000</td>
<td>$ 60,000</td>
<td>$ 81,000</td>
<td></td>
<td>$ 191,000</td>
</tr>
<tr>
<td>Improve Provisioning</td>
<td>$ 175,000</td>
<td>$ 210,000</td>
<td>$ 283,500</td>
<td></td>
<td>$ 668,500</td>
</tr>
<tr>
<td>Reduce Bad Debt</td>
<td>$ 150,000</td>
<td>$ 180,000</td>
<td>$ 243,000</td>
<td></td>
<td>$ 573,000</td>
</tr>
<tr>
<td>Improve Sales Staff and Agent Retention</td>
<td>$ 35,000</td>
<td>$ 42,000</td>
<td>$ 56,700</td>
<td></td>
<td>$ 133,700</td>
</tr>
<tr>
<td>Improve Forecasting</td>
<td>$ 80,000</td>
<td>$ 96,000</td>
<td>$ 129,600</td>
<td></td>
<td>$ 305,600</td>
</tr>
<tr>
<td>Increase Customer Retention</td>
<td>$ 123,000</td>
<td>$ 147,000</td>
<td>$ 196,280</td>
<td></td>
<td>$ 466,880</td>
</tr>
<tr>
<td>Improve Share of Wallet</td>
<td>$ 125,000</td>
<td>$ 150,000</td>
<td>$ 202,500</td>
<td></td>
<td>$ 477,500</td>
</tr>
<tr>
<td>Improve Customer Satisfaction and Loyalty</td>
<td>$ 50,000</td>
<td>$ 60,000</td>
<td>$ 81,000</td>
<td></td>
<td>$ 191,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$ 1,633,000</td>
<td>$ 1,950,000</td>
<td>$ 2,645,460</td>
<td></td>
<td>$ 6,238,060</td>
</tr>
</tbody>
</table>

Figure 28: The business process improvements in efficiency (costs) and effectiveness (revenue) of the Engage to Close (Sales) process.

The cash flows from this project net out to the following, with the project costs representing a negative, and the tangible benefits representing a positive.
When examined over time, in a project analysis view of the cash flows, this proposed project would look as in Figure 30, tracking the revenue and profit impact improvements, the proposed IT, and the operating expenses over time. When the project is first implemented, the IT and operating costs typically will increase – representing the required investment for the project. After the project is deployed, the revenue/profit impact will begin to occur, and cost savings of the project will be realized. Both typically reach a steady state over time, after which further improvements will require another investment in technology, process improvements or other practices.
Extending Traditional ROI Analysis: The ROI Dashboard

Tangible benefits alone are not enough to determine the validity of an IT investment.

Since IT projects are risky, risk must be factored as to its impact on project costs and benefit realization.

Because IT projects are often more strategic than tactical, the strategic impact on the business should be quantified and be a part of the assessment, and performance tracking process.

In many surveys on IT investment strategies, IT managers indicate that ROI is the preferred analysis method, but in these surveys the respondents clearly indicate that traditional cost-benefit analysis using ROI does not provide all of the tools necessary to measure and manage the value of IT.

In a traditional cost-benefit (ROI) analysis, the focus is on quantified monetary benefits, whereby the potential strategic impact of the investments is often not included in the analysis. Clearly, many IT projects are implemented for strategic reasons such as business agility, where some of the benefits are difficult, if not impossible to quantify. Other projects are implemented to meet regulatory demands, whereby such mandatory projects are necessary, although they may generate negative ROI.

Clearly, IT executives indicate that a traditional cost-benefit analysis of purely financial gain is not the only reason to implement various IT projects. In recent surveys, almost 70% rank intangible benefits as being equal to or greater than tangible benefits in project assessment and decision making.

![Pie chart showing the distribution of importance between tangible and intangible benefits.](image)

Figure 31: 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.

As well, IT projects are unique historically because when they are compared to most other corporate investments, they are still risky propositions. Although, as technology and management capability and maturity increase, risk mitigation has been improving, the failure statistics are still troubling, and clearly need to be factored into the financial analysis.

Based on a Standish Group analysis of year 2000 projects, nearly 2 of 3 projects failed completely, or did not meet budget, schedule, and requirement goals. More recent Standish Group surveys point to some improvements, but overall more than half of IT projects have reported shortcomings, and 1 in 4 projects are ultimately cancelled before deployment. Clearly with the high probability of potential issues, an analysis of the proposed rewards needs to factor the risks, and these risks need to be tracked and managed to assure project success.
Figure 32: Standish Group results of tracking year 2000 project success and failure rates. More recent surveys of IT projects show modest improvements, but budget, schedule and requirement risk is still a reality for most IT projects.

To make ROI more applicable to IT projects, we developed the ROI dashboard in 2001 which extends traditional ROI analysis to include intangible benefits and risk assessment – on an equal footing to the more traditional cost-benefit analysis. The Project ROI methodology integrates the Alinean ROI Dashboard Model™, which extends traditional ROI into a complete IT project assessment methodology that includes:

1. **Net Tangible Benefits** – The net tangible benefits compares the costs of the project, including IT costs and often hidden business unit costs, with the tangible benefits, those benefits which can be reliably quantified into absolute monetary terms. These benefits include IT cost savings (increasing IT productivity and reducing IT capital expenses), business operating efficiency gains (increasing user productivity and reducing business unit expenses), and increased strategic advantage (increases in revenue and profitability). The cash flow for the costs and benefits are compared using standard, time-honored measures of investment performance including Return on Investment (ROI – the net benefits / total costs), Net Present Value (NPV – the risk discounted value of the investment in today’s dollar terms), Internal Rate of Return (IRR - the predicted yield from the cash flows) and Payback Period (the time it takes for the project to be cash flow positive).

2. **Risk** – Since most IT projects are risky, with over 2/3 failing to meet key success criteria, risk is a fact of life in managing IT. As a result, analysis results need to be discounted to factor in risk. The risk of the project needs to be assessed, tracked, and managed, calculating the likelihood of occurrence and impact scope should the risk be realized. This type of analysis is referred to as a “risk adjusted discounted cash flow analysis”, and is a well accepted methodology for corporate investment management with risk factored into the analysis.

3. **Intangible Benefits** – The intangible benefits are strategic gains derived from a project, where such gains are difficult or impossible to reliably quantify in absolute monetary terms. The intangible benefits are predicted and can be measured using key performance indicators - business metrics and key ratios such as customer satisfaction, inventory turns, sales cycle and cost per unit – used to support the projects financial analysis, or predict additional benefits.
Figure 33: The Alinean ROI Dashboard model enhances the traditional financial ROI model making it more appropriate at analyzing technology benefits. The enhancements include adding intangible benefits – the strategic impact from IT, and risk assessments, throttling the benefit results with possible project issues.

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 or for short term revenue/profit gains but to actually grow the business’s capability to meet future business opportunities or challenges, 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 cost-benefit analysis using net tangible benefits, as described prior, to measuring solutions on three dimensions: Net Tangible Benefits, Intangible Benefits and Risk.

Let us now explore and define each of the required elements for an ROI analysis.

**Net Tangible Benefits**

*Those who do not believe you can quantify the costs and benefits of a proposed project are perpetuating the era of non-accountability, and the tolerance for this lack of capability and maturity will not survive.*

Net tangible benefits quantification is the heart of traditional cost-benefit analysis – measuring the net difference between the costs and tangible benefits of the proposed project, and summarizing the analysis into well recognized financial metrics such as ROI and NPV.

**Project Costs**

The project costs are all of the costs involved in planning, designing, customizing, deploying, managing and supporting the solution. The project costs seek to capture all of the lifecycle costs involved in the project – often called the total cost of ownership (TCO). Too often just the initial costs are captured, and the project costs underestimated as a result. Often over-looked or under-estimated are the on-going management and support, evolution costs such as further business process change management or customization, and retirement/replacement costs as the asset ages
and needs replacement. Because hardware and software costs typically represent less than $1 of the $4 total lifecycle costs, care should be taken to capture the complete TCO of the solution.

One of the other helpful tools to assure that all costs are captured is divide costs between IT and business units. Too often, business unit investments are underestimated. These costs include important and sometimes costly items such as user training or business process change management. Failure to assess the impact of the project on the business unit leads to cost overruns, particularly with regard to business processes, focused projects such as customer relationship management, supply chain management, project lifecycle management, human capital management and financials management. As well, underestimating the business unit commitment, and failing to get buy in from key managers and leaders, can cause adoption issues if the business units are unprepared for the investment – still one of the major failings of IT project success with regards to implementation issues and benefit realization.

Typical Project Cost includes:

**IT Costs**
- Hardware and software
- Support and maintenance fees
- Planning and design labor
- Professional services
- Implementation Labor
- Application design development and testing
- Retirement and transition labor and fees
- IT training
- Hosting and application service provider fees
- On-going management and support
- Application maintenance and evolution

**Business Unit Costs**
- Planning and coordination meetings
- Requirements development and testing
- Re-engineering business processes and change management
- User Training
- Business unit on-going management and support
- Retirement and transition labor and fees

*Figure 34: The Project Costs need to be tallied for the technologies complete lifecycle, representing the Total Cost of Ownership of the solution.*
Each cost is calculated and tallied, typically on a quarterly and/or annual basis. Some use monthly analysis, but this level of detail may be overkill for most projects.

**Tangible Benefits**

Tangible Benefits are benefits which can be quantified reliably into absolute monetary terms. The three categories that are proposed for making analysis of the benefits easier are:

- **Labor Savings / Productivity Benefits** – The savings due to expected headcount reduction from implementing the planned project, or the gains in user productivity from implementing a solution, including efficiency gains in performing specific user tasks or reductions in productivity losses, such as those generated by travel time or system downtime.

- **Capital Savings (Expense Reductions or Purchase Avoidance)** – the savings in capital expenses such as inventory costs, outsourced service fees, office supplies, shipping costs, printing costs, power or facilities expenses from implementing the planned project.

- **Business Benefit** – the gains in profit resulting from increased revenue. These gains can be driven by increased sales, more effective customer acquisition and conversion percentages, and increased customer retention.

![Figure 35: Productivity improvements can be tallied on an activity based costing basis, calculating the AS IS vs. TO BE process.](image)

To help organize these benefits, the following categories are proposed, such that the benefits can be analyzed as to their impact on IT’s overall budget and total cost of ownership, on improving overall business operating efficiency, and in improving strategic business benefits and effectiveness.

**IT Cost Reductions (IT Budget Savings)**

- Improve IT Labor Productivity and Labor Savings
- Services and Capital Purchase Avoidance


- Improve Employee Productivity and Labor Savings
- Reduced Capital Spending and Realize Purchase Avoidance
- Improve Working Capital Productivity (reducing level of Inventory, Accounts Payable and Net Fixed Asset Requirements, and reducing Days Sales Outstanding (DSO))

**Strategic Operating Effectiveness (Revenue and Profit)**

- Improve or Protect Revenue and Profit
Each of these benefits is calculated and tallied, typically on a quarterly and/or annual basis.

During the cost-benefit analysis it is important to track not just the costs, but to also tally and track changes to key performance indicators, one of the most important being resources. For each cost, many companies tally the FTEs required to implement the solution, to assure that internal resources are available to adequately implement the project. As well, FTE savings are often tracked with regard to the benefits. Project and business unit managers should “sign-up” to the allocation of resources to the project, and also to the realization of headcount reduction on the benefits side of the equation.

Direct and Indirect Benefits

When analyzing costs and benefits, it is sometimes important to further classify the various costs and benefits into their causal relationship with the IT project – whether the investment will lead to a direct benefit, or whether the investment will serve only to influence the derivation of a planned investment, an indirect benefit. The classifications are as follows:

- **Direct Benefits** – a first order effect of the proposed project and investment, where the project will directly lead to an efficiency and effectiveness gain resulting in improved productivity, labor savings, purchase avoidance, capital expense savings, or a direct revenue/profit improvement. An example of a direct benefit for the Engage to Close (Sales) process is the reduction in sales administrative overhead, whereby the sales manager is provided with tools to automate forecasting and planning, thereby directly resulting in time savings and productivity gains.

- **Indirect Benefits** – a higher order effect of the proposed project and investment, where the project will help influence the derivation of a benefit, but will not cause a direct improvement. An example of an indirect benefit for the Engage to Close (Sales) process improvement is the resultant boost in customer satisfaction from the solution’s use, and share of wallet increase from existing customers. In this case, the sales professionals need to use the solution to improve communications and correspondence to users, the customers in turn need to feel more satisfied with the company and products as a result, and make a subsequent decision to purchase more of the company’s solutions as opposed to other alternatives.

Realized Benefits

Often the benefits from implementing a project are not directly translated into bottom line savings for the company. Direct benefits, such as productivity improvements, may not help the workers be more productive, but may result in direct headcount-savings, or the predicted strategic benefits derived from additional work time. These users may squander the re-gained time for non-work related tasks.

The realization of benefits becomes even more difficult when considering indirect benefits. To account for the lack of direct translation to bottom-line benefits, a discount rate is provided, often called a realized benefit factor. This discount rate should be provided individually to each direct and indirect benefit in order to make the results more realistic and achievable. The realized benefit should be set to model:

- **User adoption issues** - based on ease of use, business process re-engineering, capability of the individuals, training, culture, management focus and objectives and other factors.

- **Translation issues to real productivity savings** – the ability to reap full time equivalent savings from the productivity enhancements, or predicted strategic benefits.
Risk of multiple dependencies to achieve results – the impact of risk in achieving benefits which are indirect, relying on a chain of benefits to produce a higher order effect.

For indirect benefits, the expected benefits should be heavily discounted into the 10-40% range to account for the complex chain of adoption and savings that need to be realized in order for the ultimate predicted benefit to be achieved. For direct benefits, the range is typically between 50-100%.

Key Financial Metrics of Project ROI

Once the specific costs and benefits have been calculated and tallied, the net cash flow of the project is analyzed. The net cash flow is the total benefits minus the total costs over the life of the project – typically three to five years.

The cash flow analysis is used to determine the projects financial viability and is typically summarized using four financial calculations:

- **Return on Investment (ROI formula)** – calculated as the projects net benefits divided by cost. As an example, if $1 is invested in a project with a 200% ROI, the project will net $2 in return – the original dollar, plus two additional dollars gained. Often, a risk adjusted ROI is used, taking into account a discount rate that reflects the project’s risk, and using this discount rate to discount the future cash flows of net benefits and costs.

- **Net Present Value (NPV)** – the project’s net savings, discounted into today’s dollar terms using a discount rate. Typically the discount rate is equal to the companies cost of capital plus a risk adjustment factor.

- **Internal Rate of Return (IRR)** - The discount rate that it takes to get the NPV formula to zero, representing the estimated returns from the project.

- **Payback Period** – the elapsed time from project start to the point where the project achieves positive cash flow, typically measured in months.

<table>
<thead>
<tr>
<th>ROI Analysis</th>
<th>Initial</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Costs</td>
<td>$1,263,593</td>
<td>$148,350</td>
<td>$154,270</td>
<td>$157,519</td>
<td>$1,723,732</td>
</tr>
<tr>
<td>Cumulative Costs</td>
<td>$1,263,593</td>
<td>$1,411,943</td>
<td>$1,566,213</td>
<td>$1,723,732</td>
<td></td>
</tr>
<tr>
<td>Total Benefits</td>
<td>$993,164</td>
<td>$1,315,147</td>
<td>$1,524,850</td>
<td>$3,833,161</td>
<td></td>
</tr>
<tr>
<td>Cumulative Benefits</td>
<td>$993,164</td>
<td>$2,308,311</td>
<td>$3,833,161</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Benefits</td>
<td>($1,263,593)</td>
<td>$844,814</td>
<td>$1,160,877</td>
<td>$1,367,331</td>
<td></td>
</tr>
<tr>
<td>Cumulative Net Benefits (3 years)</td>
<td>($1,263,593)</td>
<td>($418,779)</td>
<td>$742,098</td>
<td>$2,109,429</td>
<td></td>
</tr>
<tr>
<td>Net Present Value (NPV) Savings</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Return on Investment (ROI)</td>
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<td></td>
<td></td>
<td></td>
<td>122%</td>
</tr>
<tr>
<td>Risk Adjusted Return on Investment (ROI)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>92%</td>
</tr>
<tr>
<td>Internal Rate of Return (IRR)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>63%</td>
</tr>
<tr>
<td>Payback Period</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>17 months</td>
</tr>
<tr>
<td>Risk Assessment (n/100)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Risk Adjusted Discount Rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9.5%</td>
</tr>
</tbody>
</table>

Figure 36: Cash flows of costs and benefits are tallied and compared using several key financial indicators. These include NPV Savings, ROI, Risk-adjusted ROI, internal rate of return (IRR) and payback period.
Return on Investment (ROI)

ROI Defined: A general concept referring to Earnings from the Investment of Capital, where the earnings are expressed as a proportion of the outlay.\(^\text{10}\)

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 is fairly straightforward. ROI is the ratio of the net gain from a proposed project, divided by its total costs. In a formula, ROI is represented as:

\[
\text{ROI} = \frac{\text{cumulative net benefit}}{\text{total costs}}
\]

Once calculated, ROI is represented as a percentage that demonstrates the value of the investment; which means in formulas, ROI\% will represent the investment 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 appear as follows:

<table>
<thead>
<tr>
<th>Initial</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Cumulative Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Costs</td>
<td>$ 100,000</td>
<td>$ 25,000</td>
<td>$ 25,000</td>
<td>$ 25,000</td>
</tr>
<tr>
<td>Total Benefits</td>
<td>$ ---</td>
<td>$ 200,000</td>
<td>$ 200,000</td>
<td>$ 200,000</td>
</tr>
<tr>
<td>Net Benefits</td>
<td>$(100,000)</td>
<td>$ 175,000</td>
<td>$ 175,000</td>
<td>$ 175,000</td>
</tr>
</tbody>
</table>

\[
\text{ROI\%} \quad \frac{$425,000}{\$175,000} = 243\%
\]

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 $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.

The ROI calculation has some shortcomings. First, 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. 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. As an example, the ROI\% of a planned project might be a 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 and ROI yield is high, the project exceeds a reasonable investment risk. For example, a project that costs $10 million and has a projected net benefit of $100M, yields an

\(^{10}\) The Dictionary of Modern Economics, 4th Edition, The MIT Press, Edited by David W. Pearce
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.

Second, the simple ROI calculation typically does not use net present value terms in its calculations, but the Risk-adjusted ROI calculation does include this factor, and may be a more realistic calculation to use. The risk adjusted ROI formula is as follows, where NPV represents the net present value calculation:

\[
\text{Risk Adjusted ROI} = \frac{\text{NPV(cumulative net benefit)}}{\text{NPV(total costs)}}
\]

Net present value calculations use the “time value of money”, which takes into account the fact that the purchasing power of a dollar in the future is not worth as much as it is today. Therefore, 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 a discount rate, set initially to the cost of capital, to adjust the cost and benefit cash flows over time, into today’s dollar terms. The discount rate is typically adjusted upwards from the company’s cost of capital rate to account for the project risk.

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%

When the ROI analysis is performed over three year periods, not using Net Present Value (NPV) when determining ROI, the analysis does not typically cause issues for most basic infrastructure projects. However, if the project risks and resultant risk adjusted discount rate is high, the ROI calculation discounts savings in outgoing years when compared to hard dollar up-front costs that are required for the investment. The use of a higher discount rate models the lack of clarity in these future cash flows. As a result, these future savings may not be adequate to offset some of the upfront costs, and therefore, the project may not be worthy of funding. Because only 1 in 3 IT projects are completed on-time, within budget and meeting all requirements, both basic ROI and risk-adjusted ROI should be used in the analysis.

<table>
<thead>
<tr>
<th>Sample Risk Adjustments to the Discount Rate (added to the cost of capital)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Risk</td>
</tr>
<tr>
<td>Low Risk</td>
</tr>
<tr>
<td>Medium Risk</td>
</tr>
<tr>
<td>High Risk</td>
</tr>
</tbody>
</table>

*Figure 37: Added to the discount rate, these risk adjustment factors are used to scale the discount rate to account for project risk.*

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. The ROI calculation is valuable because it generates a projected return that can be directly compared to the company’s hurdle rate. Typically, the hurdle rate is the risk adjusted return a project needs to generate in order to be considered. By comparing the company’s risk-adjusted hurdle rate versus risk adjusted ROI, the project can be deemed worthy of further consideration or too low reward / risky versus other alternatives for the investment funds. Hurdle rates are varied company to company, but most expect
risk-adjusted ROIs in the 30% or higher range. When using non-risk adjusted ROIs, hurdle rates of 100% or more should be used for IT projects, based on current risk profiles.

But ROI alone is not the only indicator of project rewards, 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.  

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:

- The “net” part of the NPV savings calculation is the difference between all costs and all benefits (savings and other gains).
- The present value portion of the NPV calculation takes into account the time value of money; so that it adjusts expenditures and returns as they occur over time so that they can be evaluated equally, using today’s dollar terms.

Future value is the amount of money that an investment made today (the present value) will grow to by some future date. Since money has time value, we naturally expect the future value to be greater than the present value. The difference between the two depends on the number of compounding periods involved and the going interest rate. Because money has a time value, which means future payments need to be higher so that they are 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, also known as the cost of capital. Either of these rates, the opportunity cost or the cost of capital can be used as the basis for the NPV discount rate. Typically, this base rate is adjusted upward based on the project’s risk – whereby higher risk projects discount future cash flows more than lower risk projects, to account for the lack of clarity in the future for higher risk projects.

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.

---

Using the same example that was used for the ROI calculation, let’s say that a company invests 
$100,000 in a new application and 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:

<table>
<thead>
<tr>
<th></th>
<th>Initial</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Cumulative Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Costs</td>
<td>$100,000</td>
<td>$25,000</td>
<td>$25,000</td>
<td>$25,000</td>
<td>$175,000</td>
</tr>
<tr>
<td>Total Benefits</td>
<td>$-</td>
<td>$200,000</td>
<td>$200,000</td>
<td>$200,000</td>
<td>$600,000</td>
</tr>
<tr>
<td>Net Benefits</td>
<td>$(100,000)</td>
<td>$175,000</td>
<td>$175,000</td>
<td>$175,000</td>
<td>$425,000</td>
</tr>
</tbody>
</table>

The cash flow from this investment is shown as the Net Benefit, which is 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 it is quite intuitive. To express the NPV calculation in its most 
difficult terms, use the formula:

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

The \(I\)’s represent the net benefits for each year, the \(subscript 0\) represents the initial net benefit, the 
\(subscript 1\) represents 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 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 in the above table, 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. 
However, Year 1 through Year 3 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 \((1+.07)^2 = \$152,852\)
- NPV Year 3 = $175,000 divided by \((1+.07)^3 = \$142,852\)
The total NPV savings is the sum of the initial expense and the three-year NPV analysis, represented as:

\[
\text{NPV Savings} = -100,000 + 163,551 + 152,852 + 142,852 = 359,255
\]

As shown, 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 the net present value calculation increases 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 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. NPV uses discounted cash flow to accurately quantify the net benefits from a project. NPV is different from the ROI percentage, which is a ratio of net benefits to the costs, because 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.

However, like the ROI formula, it alone cannot determine whether a project is viable. As an example of the NPV calculation shortcomings, a project may yield a substantial $100M NPV savings over a three-year period, but the required initial investment of $10M may be so extreme for the company that it is not considered a prudent risk allocation of funds. 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, making the project too risky.

**Internal Rate of Return (IRR)**

**IRR Defined:** It is the DISCOUNT RATE which makes the NET PRESENT VALUE of a project equal to zero\(^{12}\)

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 \(r\), and then 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:

\[
\begin{align*}
\text{Initial} &= I(0) = - \$100,000 \\
\text{Year 1} &= I(1) = + \$175,000 \\
\text{Year 2} &= I(2) = + \$175,000 \\
\text{Year 3} &= I(3) = + \$175,000
\end{align*}
\]

For this set of net cash flows, the IRR calculation that yields an NPV of zero is 166%. 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, IRR can fail to communicate how much investment or benefit is achieved in dollar terms, and does not effectively communicate time to positive cash-flow (payback period).

**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 a traditional ROI analysis is the payback period. The payback period is the time frame needed for the project to yield a positive cumulative cash flow, which is typically specified in months. The payback period starts being measured at the beginning of a project and stops being measured 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.

<table>
<thead>
<tr>
<th></th>
<th>Initial</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumulative Costs</td>
<td>$ 523,000</td>
<td>$ 588,000</td>
<td>$ 656,000</td>
<td>$ 726,000</td>
</tr>
<tr>
<td>Cumulative Benefits</td>
<td>$ -</td>
<td>$ 700,000</td>
<td>$ 1,190,000</td>
<td>$ 2,023,000</td>
</tr>
</tbody>
</table>

*Figure 40*

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

The current trend in payback periods is the demand for payback in less than 12 months for all
projects, and in some companies has reached the point where paybacks have to occur within 90 days
of project launch. In both instances, such hard and fast criteria should be applied sparingly, as each
project is unique and requires a combination of criteria to decide on viability.

Payback period definitely has its issues as a performance metric in that it typically fails to
communicate the value of returns, only the time to returns.

Many organizations have recently placed too much focus on the time to returns. Many CIOs are
demanding that projects deliver returns within 6 months of project commencement, and within three
months of deployment. This focus on smaller more achievable projects is a positive, in that it will
assure the organization focuses on lower risk – quicker impact improvements. But such steadfast
application of these rules can be negative, and prevent longer term initiatives which could have a
significant company benefit.

Intangible Benefits

More than 67% of IT executives surveyed rate the intangible benefits of a project as important, or
more important than the tangible benefits.

Intangible benefits are strategic impacts derived from the planned project, but whose benefits are not
reliably quantifiable in absolute monetary terms.

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, just looking at the quantifiable benefits, it may be difficult to justify a corporate
Internet site for a non e-commerce company just on the basis of reduced printings and mailings of
corporate brochures. Yet, the corporate Internet serves as 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, those that only consider
tangible financial benefits, may indeed lead to the rejection of valuable and vital projects – those
with significant strategic benefits. As well, there is an entire class of mandatory projects, initiatives
to meet government regulations such as Sarbanes-Oxley, which cannot typically be justified, and
rely on the intangible benefits of meeting regulations.

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. Perhaps the clearest example of
  intangible benefits of brand-oriented projects is automotive brands, which 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, thought should be given to the intangible benefits of helping to promote the company’s brand image with the project.

- **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) corporate Internet solutions (meeting customer and investor expectations), and mandatory projects to meet government regulations.

In all cases, those items being considered as intangible benefits should come under scrutiny to determine if they can be made tangible benefits, quantifying the potential savings or profit gains. However, if the team is “stretching” to accurately quantify the intangible benefit, it may be better to keep the benefit as intangible rather than ruin the credibility and accountability of the ROI analysis.

If monetary quantification is not possible, then the team should seek to define a key performance indicator for each intangible benefit – a measure that can be used to predict the improvement derived from the intangible benefit. Not putting a measure in place for the intangible benefits propagates issues in success tracking and accountability. These can include measures such as customer satisfaction and brand affinity metrics – measures which can serve as benchmarks so that the project’s impact on strategic advantage can be tracked. If such a tracking system is not put in place, accountability as to the strategic benefits of the project is lost.

**Risk Assessment**

*Almost 1 in 4 IT projects are cancelled prior to deployment. This needs to be accounted for when assessing the potential rewards.*

*Because over 70% of IT projects still fail to deliver everything they promise in regards to on-time delivery, staying within budget, or delivering on planned benefits, discounting the proposed returns by risk is essential to realistic planning.*

*For a given project you indeed might choose to accept greater risk of failure because there’s greater reward.*

We all deal with risk in our personal investments, and we know that to receive higher returns, we usually 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, while minimizing the risk and 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 in that there is a certain cost requirement, projected returns, and risk profile for each investment. Also, each company and IT department has a given risk/reward profile based on their business, 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 assessment quantifies the potential issues a project might have, particularly those issues which may effect achievement of cost, benefit or strategic goals. 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 so prone to failure that the project should be discarded from consideration.
Section 2 - IT Value Chain Management – Maximizing the ROI and Value from IT Investments

Figure 41: Risk Analysis comparing a project’s returns versus risk. The goal is to maximize returns with minimum risk.

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, which can lead to more failures than successes.

So how can risk be measured and managed? First, the team should meet to discuss and document the possible risks. The documentation should 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 then 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 (Figure 42):

<table>
<thead>
<tr>
<th>Risk</th>
<th>Description</th>
<th>Probability of Occurrence</th>
<th>Severity Level (potential Impact)</th>
<th>Assigned</th>
<th>Mitigation Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>The IT vendor is a start-up company</td>
<td>Start-up company’s solutions may not be available in the future, along with required maintenance and support</td>
<td>25%</td>
<td>8 – may require shifting to another solution midstream, and occurring re-purchase and implementation costs again.</td>
<td>Bill Smith</td>
<td>Obtain and monitor the D&amp;B rating on the IT vendor, place source code in escrow in order to obtain if company should become insolvent.</td>
</tr>
<tr>
<td>User Acceptance</td>
<td>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.</td>
<td>35%</td>
<td>6 – the projected benefits may not be realized to predicted levels, or may be realized later than anticipated.</td>
<td>Deborah Jones</td>
<td>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.</td>
</tr>
<tr>
<td>IT resources</td>
<td>IT resources may not be available to implement the project</td>
<td>46%</td>
<td>4 – key portions of the implementation project may be</td>
<td>Mark Jones</td>
<td>The delay in IT resources could delay the implementation and time.</td>
</tr>
</tbody>
</table>
until another project is completed

delayed causing implementation delays and cost overruns.
to possible payback.

| Compatibility | The software may not be compatible with all applications and systems. | 48% | 4 – workarounds may have to be implemented, or unexpected 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** – Labor resource risks are the hardest to control, 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 with 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 funding.

**Market or Strategic** – The market may shift, competitors may change their strategy, or the company may change strategic direction, which could change the project requirements, or change 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.

**Dependencies** – There may be risks that can affect a family of dependent projects, such as delays, resources or budgets.
More often than not, three factors can be altered to help mitigate risks: resources, features, and schedules. To mitigate the risks the team can increase resources, which usually increases costs, reduces features and often reduces benefits, and lengthens the schedule causing a reduced time-to-benefits. The management of resources, features and schedules is vital to containing expected costs, achieving predicted benefits, and eliminating risk.

As with the overall ROI analysis, 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 guarantee that costs are controlled, and benefits are delivered, which increases the odds that the expected project returns will be realized.

In our ROI Dashboard model, risk is directly compared 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 it 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 assess risk 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, simply factor each of the probabilities verses severities and develop an average score.

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.

**Risk-Adjusted Discounted Cash Flow Analysis and the Risk Adjusted Discount Rate**

Besides having a separate measure for risk, the relative risk of a project should be factored into the net tangible benefit analysis. In a risk-adjusted discounted cash flow, the present value of liabilities
is subtracted from the combined present value of cash flow and tangible assets, which determines the value of the business.

The calculations use a risk adjusted discount rate to factor project risk into the financial calculation of net present value. Nominally, the discount rate is set equal to the company's cost of capital. In risk adjusted discounted cash flow analysis, the discount rate is scaled upwards to account for higher risk. The use of a higher discount rate means that future cash flows which are typically unclear in risky projects will be discounted. This higher risk adjusted rate is used to discount future cash flows to account for uncertainty in assumptions and possible issues in controlling costs or realizing returns.

The risk-adjusted discount rate is applied to two formulas in the net tangible benefits calculation:

- Risk Adjusted ROI = Net Present Value Cumulative Net Benefit/Net Present Value of Total Costs
- NPV Savings

The discount rate should be set based as follows:

- Project Risk = average risk score of risk elements
- Risk score = probability of occurrence * relative importance should the risk occur
- Risk adjustment = table lookup to risk adjustment %ages based on risk score
- Discount rate = cost of capital + risk adjustment

A sample risk adjustment table is as follows:

<table>
<thead>
<tr>
<th>Risk Score</th>
<th>Risk Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10</td>
<td>0%</td>
</tr>
<tr>
<td>11-20</td>
<td>10%</td>
</tr>
<tr>
<td>21-30</td>
<td>20%</td>
</tr>
<tr>
<td>31-40</td>
<td>30%</td>
</tr>
<tr>
<td>41-60</td>
<td>40%</td>
</tr>
<tr>
<td>Above 60</td>
<td>50%</td>
</tr>
</tbody>
</table>

Figure 45: Sample risk adjustment table.

### Step 2: Project Selection and IT Budget Planning

When all projects are taken together – although the individual plans may be sound – the portfolio of plans may not be sustainable and goals may be unachievable when combined.

Diversifying investments, optimizing risk and reward, and assuring achievability on implementation and results are a key goal of successful project selection and IT Budget Planning.

Clearly communicating the budget’s risks and rewards, as well as the impact on the business is essential for making the executive case for approval, and making sure that the true value of IT is understood.

**Questions to Answer:**

- What is the overall Value of the proposed IT plan?
What IT and business unit investment is needed to implement all of the planned projects?
What impact will the planned projects have on the Corporate Financials, IT Operating Budget and Key Performance Indicators?
Which projects are the best to optimize benefits while reducing risks?
How can IT easily prepare compelling budget presentations for executives and board of directors?

Looking at ROI on a project level can be deceiving. In isolation, the project ROI analysis might be predicting reductions in headcount, increases in productivity, or revenue enhancements, which are too aggressive when balanced against the other plans, and the realities of the corporate income statement, and balance sheet. When combined with other projects, the individual projects may exceed budget limitations or might be predicting un-achievable benefits. Each of the individual projects need to be combined and analyzed with other projects in order to determine the collective impact on the IT budget and corporate financials, and to create realistic plans to which the team can be accountable for.

The first step in this progression, from Project ROI to optimized budget plan is to simulate one plan, or better yet several alternative plans, selecting in various combinations the highest reward and lowest risk projects, and determining the impact on the overall IT Budget.

To see the impact of each project, various important factors can be plotted to compare each projects’ strategic significance, investment requirements, risks and rewards. Too often, projects are selected which revolve around one strategic focus, with today’s fiscal climate, those involving cost reductions are often at the heart of the IT plans. By analyzing and assessing projects in each of the four strategic focus groups, the investments can be better deployed - balancing cost reductions with strategic impact. Using this technique, investments can be selected in each one of the strategic focus groups, providing a balanced portfolio between IT centric cost reductions, business centric productivity improvements, strategic value and corporate / external governance projects.

To help visualize a diversified portfolio, the following project type classifications are proposed:

- **IT Cost Reduction Projects**
  A strategic project classification reflecting IT focused initiatives which help to reduce IT Operating Expenses by increasing IT productivity, avoiding IT purchases, reducing fees and contracts or reducing IT headcount.

- **Business Operating Efficiency Projects**
  A strategic project classification reflecting business unit focused initiatives which help reduce business unit operating expenses, cost of goods sold, or depreciation by helping business units to increase productivity and efficiency, avoid purchases and expenses, avoid risk related losses.

- **Business Strategic Advantage Projects**
  A strategic project classification reflecting projects focused on increasing revenue and sales. These projects include those which help to increase sales productivity, customer acquisition and loyalty, increase sales effectiveness or the launch of a new business.

- **Mandatory Projects**
  A strategic project classification focused on meeting corporate governance rules, legal requirements, or other mandated initiative. These projects sometime include vendor mandates, such as migrating to a new platform due to lack of continued support.

Additional classifications can be added, but these basic four seem to work for most organizations.
Section 2 - IT Value Chain Management – Maximizing the ROI and Value from IT Investments

<table>
<thead>
<tr>
<th>Proposed Projects 2004</th>
<th>Project Type</th>
<th>ROI</th>
<th>Risk Score</th>
<th>3-year Cost (000,000s)</th>
<th>NPV (3-year) (000,000s)</th>
<th>IRR</th>
<th>Payback Period (Months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Network Storage Consolidation</td>
<td>IT Cost Reduction</td>
<td>332%</td>
<td>37%</td>
<td>$1.50</td>
<td>$3.88</td>
<td>123%</td>
<td>10 months</td>
</tr>
<tr>
<td>(2) Server Consolidation</td>
<td>IT Cost Reduction</td>
<td>147%</td>
<td>12%</td>
<td>$2.22</td>
<td>$2.41</td>
<td>73%</td>
<td>15 months</td>
</tr>
<tr>
<td>(3) Security Improvement</td>
<td>Mandatory Project</td>
<td>100%</td>
<td>10%</td>
<td>$1.0</td>
<td>$2.40</td>
<td>129%</td>
<td>6 months</td>
</tr>
<tr>
<td>(4) Customer Resource Management</td>
<td>Strategic Advantage</td>
<td>95%</td>
<td>59%</td>
<td>$4.85</td>
<td>$4.51</td>
<td>65%</td>
<td>18 months</td>
</tr>
<tr>
<td>(5) Human Capital Management Automation</td>
<td>Operating Efficiency</td>
<td>60%</td>
<td>45%</td>
<td>$4.50</td>
<td>$5.00</td>
<td>60%</td>
<td>15 months</td>
</tr>
</tbody>
</table>

Figure 46: Various projects are stacked ranked according to risks and rewards to quickly visualize the impact of the proposed plan, and to begin optimizing the diversity of the portfolio across various project categories, maximize reward, minimize risk with minimum investments.

Figure 47: Plotting projects using a bubble diagram is a good method to visualize the investment, risk and reward of planned projects. The width of the bubbles represents the required investment (cumulative project costs), while the X axis represents the reward (measured using ROI), and the Y axis represents relative risk.

As well, it is often valuable to see projects classified according to their business process focus. Using the ValueMap™ for classifying business process impact, projects can be viewed according to their planned impact on the business.
Section 2 - IT Value Chain Management – Maximizing the ROI and Value from IT Investments

Figure 48: Plotting projects by ValueMap segment can demonstrate the risk and rewards by business process segment to assure that project investments and benefits are diversified.

The IT Budget overall consists of the current operating budget, the capital and operating expenses currently planned over the next three to five years. This is called the “Base Case” IT Budget. This plan represents the do-nothing IT plan, and does not include the investments needed to implement the planned project portfolio, or the resultant benefits such as reduced capital or operating expenses. Against the base case, the sum of all of the planned project’s costs and IT benefits are applied, year by year, and in most cases quarter by quarter. The result should illustrate the new IT budget, including the change costs for the new projects, proposed savings in the current operating budget, changes in the capital and operating expenses mix, and overall TCO impact.

**New IT Budget = IT Budget Base Case + Planned Project Costs – Planned Project IT Benefits**

<table>
<thead>
<tr>
<th>2004 IT Budget Plan</th>
<th>Number of Projects</th>
<th>IT Costs (000,000s)</th>
<th>Business Unit Costs (000,000s)</th>
<th>Total Costs (000,000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Cost Reductions Projects</td>
<td>2</td>
<td>$3.28</td>
<td>$0.05</td>
<td>$3.33</td>
</tr>
<tr>
<td>Business Operating Efficiency</td>
<td>0</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Business Strategic Advantage</td>
<td>1</td>
<td>$4.25</td>
<td>$3.55</td>
<td>$7.80</td>
</tr>
<tr>
<td>Mandatory Projects</td>
<td>0</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3</strong></td>
<td><strong>$7.53</strong></td>
<td><strong>$3.60</strong></td>
<td><strong>$11.13</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3</strong></td>
<td><strong>$15.15</strong></td>
<td><strong>$3.60</strong></td>
<td><strong>$18.75</strong></td>
</tr>
</tbody>
</table>

**Proposed IT Spending/Revenue = 2.5%**

**Proposed IT Spending/Employee = $9,450**

**Proposed IT Spending/Information Worker = $13,545**

Figure 49: An example of a budget plan calculation using the proposed simulation. This table clearly highlights the required investments, change in on-going IT budget as a result of the proposed project benefits, and new total IT budget. Various per capita IT spending figures help to present the plans to executives and in comparing spending plans to peers (see step 4).

To calculate the TCO changes requires that each cost and benefit be categorized according to common TCO chart of accounts. For each project cost and benefit in Project ROI, costs should be categorized into various IT spending categories so they can be tracked and the TCO before and after
can be easily measured and compared. The following standard categories of costs and benefits are proposed.

**IT Spending Categories**

IT Spending can be analyzed in detail, often using the name Total Cost of Ownership, to assess all of the IT costs for various infrastructure, operations and overhead. The IT Spending categories include:

1. **IT Data Center and Servers Spending** - Quantifies the spending on servers, storage, and backup/restore systems.

2. **IT Distributed Processing Spending** - Quantifies the spending on Personal Computers and Terminals, Handhelds and Printers.


4. **IT Purchased Services Spending** - Quantifies the spending on Hardware Break-Fix Support, Software Maintenance, Business Consulting, IT Operations and Administration Services and Managed Services.

5. **IT Communication Spending** - Quantifies the spending on Network Hardware, Wireless Hardware, and Data Communication.

6. **IT Development Spending** - Quantifies the spending on Design, Development, and On-going Maintenance.

7. **IT Operations and Administration** - Quantifies the spending on Operations and Administration staff. IT Operations staff includes Level 1 Support, Level 2 Support, Level 3 / Dispatched Support, Performance and Availability, User Administration, Operating System Support, Maintenance, Software Deployment, Application Management, Systems Management, File and Storage Management, Security Management. IT Administration staff includes Asset Management, IT Finance (Audit, Chargeback, Budgeting), Purchasing and Procurement / Contracts, Vendor Management, IT Training (Course Development and Delivery), User Training (Course Development and Delivery), and Supervisory / Management.

8. **IT Facilities and Overhead Spending** - Quantifies the cost for IT facilities, supplies, power and other facilities, and overhead spending.

This process requires the “As Is” TCO to be measured before the project portfolio is implemented, and then tracked on an on-going basis to measure improvements. This process will be highlighted in Step 4.

One of the other important classifications of these costs and benefits is categorization between capital expenses and operating expenses. Often businesses have initiatives to track these independently, reduce one or the other, and limit resources with regard to these classifications. Knowing project costs, and benefits according to these categories can help with overall budget planning. The definitions are as follows, but should be clarified with the CFO to be sure classifications of particular expenditures match the corporate designations:
- Capital Expense: the expenditures to acquire or improve long-term assets such as property, plant or equipment. These can include cash payments for the assets, leases classified as capital expenses by generally accepted accounting practices (GAAP).

- Operating Expenses - all selling and general & administrative expenses. An income statement term that refers to the essential items a company spends money on in order to remain in business. These expenses include labor and fees for sales and marketing, general and administrative, research and development. Depreciation, interest expenses, and Cost of Goods Sold are typically not included in the calculation of Operating Expenses.

![Figure 50: An example of a comparing capital and operating expense changes in the proposed IT plan. When considering managed services and other plans it is important to understand the changes to capital and operating expense mix.](image)
**Step 3: Corporate Impact Analysis**

*IT justifications need to be presented not as technical plans and strategies, but as accounting objectives.*

*The technical plan and architectural details may be the world of the CIO, but the CFO and most other executives care much more about the corporate financial impact of the plan, rather than its technical prowess.*

Corporate Impact Analysis is step 3 in the IT Value Chain Management methodology. This step is one of the most important, in that it helps translate the proposed IT project plan into the realities of corporate performance. This process simulates the impact of the detailed costs and benefits on the corporate financials.

Too often CIOs put together budget plans which are heavy on technical roadmaps and architectures, but light on the important financial impact of the proposed plans. Unfortunately, many executives already respect the CIOs technical expertise as a CTO. What the board wants to see more often than not is that the CIO has done due diligence on the financial aspects of the plan, and that the plan delivers towards the strategic plan and bottom-line.

Today, with pressure on financial payback, most CIOs have stepped up and are including project ROI information with their plans. But the issue with Project ROI is that the ROI analysis is micro-economic, focused on a bottom-up analysis of the particular project’s costs and benefits, but not on how these costs and benefits impact the financial performance of the company, and impact the key performance indicators that shareholders care about. Of course the ROI, NPV, IRR, payback period and risks are important to quantify, manage and communicate, but a more top-down presentation often has greater impact, starting with what is most important to the CFO, CEO and board of directors.

What is most appropriate to report? CFOs and other executives live in the world of the income statement, balance sheet and cash flow statements. The corporate impact analysis translates the project portfolio’s cash flows – the costs and benefits – into income statement, balance sheet and cash flow statement impacts. The key is to highlight IT’s contribution to the financial statements, quantifying the impact the proposed plan will have on the income statement elements, for example:

- Revenue – strategic benefits in growing markets, gaining customer share of wallet or opening new revenue opportunities
- COGS – efficiency gains in procuring materials or reducing other variable costs
- Operating Expenses - typically the project costs offset by productivity savings and purchase avoidance benefits
- Inventory Impact – the reduced need to have inventory on hand, a one-time working capital benefit, and the reduction in on-going carry costs for such inventory
- Accounts Payable – reducing the level of accounts payable
- Accounts Receivable – reducing Days Sales Outstanding
- Net Fixed Assets – reducing the need for net fixed assets (a one-time working capital benefit), and the on-going depreciation benefit from reducing these assets.
- Depreciation Impact – typically the depreciation charge for assets, offset by any changes in write-downs of existing assets
- Profit Impact – the bottom-line impact of the proposed plan
The presentation of the corporate impact should expand from this percentage level impact to more detail as required. This should include a year by year analysis of the impact of IT costs and benefits on the corporate financials.

<table>
<thead>
<tr>
<th>2004 Income Statement Base Case vs. Proposed Plan</th>
<th>Benefit (Impact of Proposed Solutions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$10.00</td>
</tr>
<tr>
<td>Cost of Goods Sold (COGS)</td>
<td>($0.26)</td>
</tr>
<tr>
<td>Gross Margin</td>
<td>$10.26</td>
</tr>
<tr>
<td>Operating Expenses</td>
<td></td>
</tr>
<tr>
<td>Sales and Marketing</td>
<td>$0.00</td>
</tr>
<tr>
<td>General and Administrative (G&amp;A)</td>
<td>$3.15</td>
</tr>
<tr>
<td>Research and Development</td>
<td>$0.04</td>
</tr>
<tr>
<td>Interest Expense</td>
<td>$0.00</td>
</tr>
<tr>
<td>Total Operating Expenses</td>
<td>$3.19</td>
</tr>
<tr>
<td>Net Income (Loss)</td>
<td>$7.07</td>
</tr>
<tr>
<td>Depreciation</td>
<td>$0.00</td>
</tr>
<tr>
<td><strong>EBIT</strong></td>
<td><strong>$7.07</strong></td>
</tr>
</tbody>
</table>

Figure 52: The project portfolio’s impact on the corporate financial P/L is simulated, tallying the required investments and realizable benefits. The result is a clear and concise budget report for the CFO and board of directors, in corporate financial terms.

How can the simulation be accomplished? First, the team should establish the base case financials, the three or five year “do nothing” plan. This “As Is” base case plan represents the revenue, COGS, operating expenses, depreciation, and net profit without the proposed project portfolio.

Next, for each Project ROI analysis the costs and benefits need to be categorized and mapped according to their respective corporate impact categories. When projects are selected for inclusion in the plan, these costs and benefits can then be tallied year by year against the corporate financials to determine the outcome.

One of the criticisms with an ROI analysis is that the plans tend to be unrealistic. Because the Project ROI analysis is done in isolation, taking a bottom-up micro-economic approach, benefits are often overstated.

With the corporate impacts readily visible, the team can determine if the detailed project plans are too aggressive in their benefit assumptions. Suddenly, once the plan is placed in terms of corporate financial improvements that the team is signing up for, the individual project plans are often reworked to only include reasonable and achievable benefits.

If done correctly, the simulation of corporate financial impact can allow the team to simulate the impact of various “what-if” plans to determine the optimum mix of realistic bottom-line impact. This can include changing the mix of the proposed projects, or shifting the starting dates of various plans. The more automated this process, the easier it is to run the simulations, including the ability
to alter and simulate plans on the fly with the IT decision board, or in meetings with the CFO and auditors.

With an optimized plan, presented in terms the CFO, CEO and board can readily relate to, the proposed project portfolio stands a higher chance of being accepted, and the team can more easily track performance and maintain accountability amongst all stakeholders.

**Step 4: Comparing Current Performance and Proposed Plans against Peers**

*CIOs need to see how they stack up, not just on spending, but on driving bottom-line performance*

*Unfortunately many CIOs have their hands full with day to day operations and don’t look outside their organization to compare spending and performance to leaders within their industry, or even further, to benchmark against leaders within other industries.*

*CFOs will be armed with industry average spending metrics, and articles on how frugal IT wins wrecking havoc on the CIO who does not have detailed peer comparisons ready, to justify spending plans in a top down manner.*

**Questions to Answer:**

- How does our IT spending and budget compare to our peers?
- How does the overall value derived from IT compare with our nearest competitors?
- What specific opportunities exist to lower costs and drive additional business value
- What do we need to do to become best in class?

One of the most common questions being asked in IT spending committees and strategic planning boardrooms is “Are we getting the most from our IT investments?”. One way to answer this question is to take a top down macro-economic analytical approach using competitive benchmarking. With benchmarking the team can analyze the company’s IT spending and derived value versus the spending and ROI of the closes competitors.

Although everyone would like to have a single magic metric of IT value performance, realistically, businesses are complex and performance is measured at many levels. Your peer comparison should be multi-dimensional in relation to the complexity and multi-dimensional aspect of your business.

Regardless of the comparison metric chosen, the team should examine the value and spending efficiency leaders in the peer group to uncover some insight about how to adjust spending levels and apply investments more effectively to derive more value per capita, and compare themselves to the followers, to understand what not to do. Of course there are many factors as to why a company is positioned as it is in the marketplace, and there is not always a direct causal relationship between IT spending and competitive positioning; but, more often than not, proper IT investments and management can lead to change, and this competitive peer comparison can serve as a valuable guidepost to better situational awareness, improved strategic planning, and more importantly over time, a top-down measure of the derived ROI from IT.

The peer comparison benchmarking can include the following:

- **Income Statement Performance and Ratios** – comparisons of revenue, cost of goods sold, gross margin, operating expenses, net profit, revenue per employee, EVA per employee, and SG&A as a percentage of revenue and other key financial ratios.
- **Balance Sheet and Cash Performance and Ratios** – comparisons of accounts payable, accounts receivable, equity, working capital productivity, inventory turns, days sales outstanding and other key financial ratios.

- **IT Spending per Capita** – IT spending overall, and as a percentage of revenue, per employee, per knowledge worker and other key ratios.

- **TCO Analysis** – IT spending by cost category including data center and servers, distributed computing, purchased software, purchased services, communications, IT operations and administration, facilities and overhead, indirect spending and availability.

To quickly illustrate the competitive positioning of the various peer’s performance vs. IT spending, Alinean has developed the PeerMap™, a quadrant analysis that correlates spending versus financial performance and clearly indicates which companies are the leaders and followers.

**Figure 54: The Alinean PeerMap™ highlights the IT Spending versus derived value. Using this information, the team can track investment performance over time, and guide investment planning with increased situational awareness. IT Spending can be plotted on a per revenue, per employee or per knowledge worker basis.**

The quadrants are divided into the following classifications, based on the company’s position relative to peer average IT spending vs. performance:

**Frugal Leaders** – These companies are on average spending below their peers on IT, and getting higher impact from their IT spending and other business investments. These companies are often not innovative in their application of IT, rather, they take a wait and see approach to change and
investing, investing behind the curve once a technology has matured. As well, these companies often have higher capability and maturity than their peers. The danger for these companies is that should their be a fundamental shift in the business model for the sector, these companies could lag behind the curve on that shift and lose competitive position and market share. Unless these companies mis-step, their leadership position is normally secure.

The risk: If the market sector shifts dramatically, or they rest on their laurels too long, Frugal Leaders can be left behind.

The advice: Frugal Leaders must monitor their mix of innovative solutions, and cycle periodically into Investing Leaders when product lifecycles dictate and market growth opportunities emerge.

**Investing Leaders** – These companies are on average spending higher than their peers on IT, but are getting good impact from their IT and other business investments. These companies tend to have higher than average budgets for innovation, or are in the near term making an investment in specific projects and initiatives to reinvent the business or process change using technology. Sometimes, when a market sector retracts, these companies are not as adept as their frugal leader peers in scaling operations quickly to meet changing market demands. Investing leaders are more often than not trying to effect a change in their competitive positioning through their higher spending levels. Over time these investing leaders should be either improving their position, and/or moving towards reaping the rewards from their investments and becoming a Frugal Leader for a period of time. Sustained higher spending levels, although the company is still reaping rewards, shows that a percentage of the spending is being squandered compared to the Frugal Leader peers.

The risk: When the market retracts or the investing cycle runs its course, these companies may have built spend-heavy cultures, and not be quick to scale back.

The advice: Within a few years, these companies should become Frugal Leaders to match the ebb and flow of their lifecycle and market, or risk becoming habitual over-spenders.

**Investing Followers** – These companies are on average spending higher than their peers on IT, and are not positioned well compared to their peers. It could be that these companies are investing in reinventing their business, improving processes, launching new products or other important short term investments to reap longer term rewards. It could also indicate that the company is not investing in the right IT projects for strategic advantage and business operating efficiency improvements, has squandered the value from these investments, or has not implemented best practices to help reduce ongoing TCO. If the investing follower does not see a move to investing leader or frugal leader over time, change is in order.

The risk: These companies continue to invest, but fail to move to a leadership position within two to three years of the investment.

The advice: More than any other group, these companies need to get a handle on their free-spending ways, and lack of resultant value. The innovative investments may have burdened the business with overhead, which could be reduced with best practices or strategic outsourcing. If no change in value occurs over the next three years, then the investments are being squandered. They should be redirected, or more tightly managed.

**Frugal Followers** – These companies are on average spending less on IT than their peers, and are also not in an attractive competitive position comparative to the leaders. These companies often are technology investment laggards, who have some positive traits with regard to their frugal ways, and implementing best practices to help reduce costs. Whether due to a lack of investing in innovative technology, some inherent product lifecycle challenge, or recognizing some other fundamental business shift in the sector, these companies have fallen behind their peers. These followers often need to migrate in the near term to an investment phase in order to effect a change in their competitive position.
The risk: Continuation of their trailing ways if they fail to invest more substantially, soon.

The advice: Don’t change too far too fast. Select one or two modest high-impact strategic projects that could help change the market or target a competitor.

From the plot of spending versus performance for the company and the peers, the team can set goals for change, drill down into more specific financial metric comparisons to uncover areas for improvement, and most importantly, track IT investment performance over time – as it helps guide the team toward competitive advantage.
IT Spending in 2004: The Expected Increases and the Hidden “Tax”

*IT budgets are expected to increase 5 to 8 percent in 2004. However, much of the budget will be consumed by regulatory compliance initiatives, security and long-awaited infrastructure upgrades – leaving little to address the growing backlog of business unit requests, or innovative programs to address the market recovery.*

*After the 20 percent decline in U.S. IT spending from 2000 to 2003, the expected 2004 budget recovery is seen as a boon to most CIOs. However, two troubling trends are on the horizon:*

**The Hidden Tax on IT**

Much of the budget increase will be consumed by three initiatives, each adding little ‘real value’ to the business. These ‘hidden taxes’ include:

- **Sarbanes-Oxley**: To ensure compliance and meet reporting regulations, organizations are overhauling financial reporting systems and business processes.

- **Enterprise security infrastructure and compliance**: Many companies were struck by a wave of attacks this year, costing organizations millions in lost productivity and business. As a result, companies are forced to bolster security tools, delivering little ‘real value’ to the organizations’ market share or business.

- **PC upgrades**: In preparation for the Y2K issues, many organizations invested in PC and other infrastructure upgrades, but now these investments are four years old, and organizations need to upgrade again. (Visit [http://intel.com/business/bss/products/client/pcrefresh/roi_tool.htm](http://intel.com/business/bss/products/client/pcrefresh/roi_tool.htm) to calculate whether the upgrades can reap rewards for your organization.)

**Shadow/Rogue IT**

The formal budget shortfalls and growing backlog is causing a remarkable increase in shadow IT spending, also known as ‘rogue IT.’ Business leaders have been gaining stealth approval for technology spending, wrapping equipment purchases, applications and development projects within other business investments.

The shadow/rogue budgets are estimated to be 20 percent of total IT spending in most organizations. Shadow projects come at a steep cost, when centralized IT needs to support and integrate the solutions back into the mainstream.

**Steps IT Executives Should Take**

- Ensure that compliance, security and infrastructure upgrades are well funded, but do not consume all of the 2004 budget increases

- Examine and possibly undertake Web services, RFID, e-business and business intelligence projects that will be important to have in place when the recovery is underway

- Work with the CFO and business unit executives to understand the level of shadow/rogue IT spending, and get a handle on it
Steps IT Vendors Should Take

- Realize that the IT budget increase will mean very little relief to already over-taxed prospects and customers. Decision-makers will continue to face growing internal demands on strained IT budgets, external compliance and security “tax.”
- Proposal approvals will still be won and lost based on compelling and credible ROI analysis and quantifiable value proof points.
- The winning vendors will help the IT executives to “do more with less,” and help assess the stack ranking of proposals with other vital spending priorities.

The Value of Effective IT Value Chain Management

*Every CIO needs to migrate from the role of the CTO, to become the CFO for IT investments.*

*Speaking the language of the CFO is an essential success tool for CIOs in this new era of IT accountability.*

*70% of CIOs find it difficult to calculate the ROI of planned projects, while 73% don’t calculate the ROI on projects after they’re completed, - CIOInsight 2003*

*You have to start somewhere, but not so complex that every stakeholder needs a masters in finance to understand the value of a project, or the benefits of the planned portfolio to the corporation.*

These steps are only a subset of the entire value chain management process, but highlight four of the most important steps in raising the capability and maturity of financial management of IT investments. These fours steps should help the team:

- Drive more fruitful communication and accountability with CxO level executives and business unit leaders,
- Focus the team more on business value, not just cost,
- Obtain alignment between business goals and proposed IT solutions,
- Optimize spending plans to do more with less.

Used in a continuous planning lifecycle, these management techniques, quantifications and simulations can help the team prove and improve the value of IT.
**Appendix A: Glossary**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts Payable</td>
<td>The accounts payable represents the current liability on the balance sheet, representing short term obligations to pay suppliers.</td>
</tr>
<tr>
<td>Activity-Based Costing (ABC)</td>
<td>A financial analysis costing methodology that associates specific efforts and personnel with specific tasks, allowing the tasks to be analyzed, and the current costs dedicated to specific tasks to be well understood. A simple activity based costing analysis can be: Number of times tasked performed annually * avg. time takes to perform * burdened salary ($/hour) = activity cost. In order to derive savings estimates and ROI for projects, it is often important to do an activity based costing analysis, measuring/estimating the current cost for the activity, and demonstrating reduction in number of tasks, avg. task time, or person required to perform the task, in order to demonstrate savings. Formal Definition: ABC is a costing system that identifies the various activities performed in a firm and uses multiple cost drivers (non-volume as well as the volume based cost drivers) to assign overhead costs (or indirect costs) to products. ABC recognizes the causal relationship of cost drivers with activities.</td>
</tr>
<tr>
<td>Analysis Period</td>
<td>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, or need to return value in this time frame due to risk.</td>
</tr>
<tr>
<td>Asset</td>
<td>An asset is anything owned by an individual or a business, which has commercial or exchange value. Assets may consist of specific property or claims against others, in contrast to obligations due others. (See also Liabilities).</td>
</tr>
<tr>
<td>Availability</td>
<td>A percentage measure of the time a system is up, running and available to perform the necessary functions, retrievals or calculations. The inverse of availability is downtime; the amount a system is unavailable for the desired function.</td>
</tr>
<tr>
<td>Balance Sheet</td>
<td>A company’s financial statement that reports its assets, liabilities, and shareholders’ equity at the time of reporting. The balance sheets record the details of the assets, liabilities and shareholders’ equity, resulting in the following “balanced” formula, where one side of the equation, the assets, must be equal to the liabilities + shareholders’ equity:Assets = Liabilities + Shareholders’ Equity. Formal Definition: The balance sheet is an itemized statement that lists the total assets and the total liabilities of a given business to portray its net worth at a given moment of time. The amounts shown on a balance sheet are generally the historic</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Balanced Scorecard</td>
<td>A measurement and management methodology designed to help IT projects align with business goals. The methodology helps the team identify key business performance measure tracking key financial, customer, internal and growth metrics. The term balanced in the scorecard refers to the balance of goals between those which are internally focused (such as financial performance and employee growth), and externally focused (customer oriented).</td>
</tr>
<tr>
<td>Base Case Financials</td>
<td>The current financial plan without the costs and benefits of the planned project. The base financials are often referred to as the “do nothing” plan.</td>
</tr>
<tr>
<td>Best Practices</td>
<td>A demonstrated capability that meets desired results to achieve best-of-breed performance.</td>
</tr>
<tr>
<td>Benchmark</td>
<td>A benchmark is a study to compare actual performance to a standard of typical competence; or, a standard for the basis of comparison as being above, below or comparable to.</td>
</tr>
<tr>
<td>Book Value</td>
<td>Book Value is an accounting term which usually refers to a business’ historical cost of assets less liabilities. The book value of a stock is determined from a company's records by adding all assets (generally excluding such intangibles as goodwill), then deducting all debts and other liabilities, plus the liquidation price of any preferred stock issued. The sum arrived at is divided by the number of common shares outstanding and the result is the book value per common share. Book value of the assets of a company may have little or no significant relationship to market value.</td>
</tr>
<tr>
<td></td>
<td>* Tangible Book Value is different than Book Value in that it deducts from asset value intangible assets, which are assets that are not hard (e.g., goodwill, patents, capitalized start-up expenses and deferred financing costs).</td>
</tr>
<tr>
<td></td>
<td>* Economic Book Value allows for a Book Value analysis that adjusts the assets to their market value. This valuation allows valuation of goodwill, real estate, inventories and other assets at their market value.</td>
</tr>
<tr>
<td>Breakeven</td>
<td>The time period from the start of the project until the cumulative cash flow turns positive or for the project to breakeven.</td>
</tr>
<tr>
<td>Business Case</td>
<td>An analysis of a particular project to determine the costs, benefits, strategic value and risks. The business case is used to determine whether a project is worthy of investment.</td>
</tr>
<tr>
<td>Business Operating Efficiency</td>
<td>A project benefit used in calculating ROI. Calculates the impact the project has on the business units and operating expenses. These impacts include helping to increase productivity, reduce the risk of productivity losses, avoid purchases, reduce expenses and reduce overhead.</td>
</tr>
<tr>
<td></td>
<td>Business Operating Efficiency calculates the project’s impact on reducing key</td>
</tr>
</tbody>
</table>
corporate financials including: Cost of Goods Sold (COGS), Sales and Marketing (S&M), General and Administrative (G&A), Research and Development (R&D), Interest Expenses and Depreciation.

**Business Operating Efficiency Projects**
A strategic project classification reflecting business unit focused initiatives which help reduce business unit operating expenses, cost of goods sold, or depreciation by helping business units to increase productivity and efficiency, avoid purchases and expenses, avoid risk related losses.

The benefits are reflected as impacts to Revenue on the corporate financials.

**Business Strategic Advantage**
A project benefit used in calculating ROI. Calculates the impact the project has on the corporate revenue and sales. These impacts include helping to increase sales productivity, customer acquisition and loyalty, increase sales effectiveness or the launch of a new business.

**Business Strategic Advantage Projects**
A strategic project classification reflecting projects focused on increasing revenue and sales. These projects include those which help to increase sales productivity, customer acquisition and loyalty, increase sales effectiveness or the launch of a new business.

**Business Unit Costs**
Costs incurred by business units in implementing an IT project, and collected to perform an ROI Analysis. Business Unit Costs represent one of two costs for a planned project, the other being IT Costs.

The business unit costs typically include: Administrative, User Training and Other.

**Business Unit IT Spending**
IT spending that is not in the official IT budget, but is borne by the business units. Business Unit IT Spending includes budgeted labor by business unit headcount administering IT or planning, implementing, developing or maintaining projects. As well, these expenses can include training, learning and purchases. These expenses are typically not hidden, and with research can be uncovered.

Business Unit IT Spending can be a significant portion of Total IT Spending, in some cases where IT spending has been substantially reduced, exceeding the Official IT Budget. More typical however, the business unit spending is 10-20% of the Total IT Spending.

**Capital Asset**
Any asset of a permanent character and having continuing value to the business. Examples are facilities, buildings, land and equipment.

**Cash**
The amount of a company’s legal tender balances, and the value of assets that can be converted into cash immediately. The cash total usually includes bank accounts and marketable securities, such as government bonds and banker’s acceptances.

**Cash Flow Analysis**
An analysis of the costs and benefits of the project over time. In a cash flow analysis, the positive (benefits) and negative (costs) are plotted on a time line, to determine the required investment and potential value of the project. Cash flow analysis is conducted using annual buckets.
<table>
<thead>
<tr>
<th><strong>Cash to Assets Ratio</strong></th>
<th>The cash to assets ratio is a measure of a company’s liquidity, indicating the proportion of assets which are in cash. The ratio is calculated as cash divided by total assets.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cash to Liabilities</strong></td>
<td>The cash to liabilities ratio is a measure of a company’s ability to meet its liabilities, and is calculated as cash divided by total liabilities.</td>
</tr>
<tr>
<td><strong>Cash to Working Capital</strong></td>
<td>Compares the ratio of cash divided by working capital, where working capital is calculated as accounts receivable + inventory – accounts payable. This ratio indicates the proportion of working capital that is comprised of cash, whereby a low ratio indicates a company which may have trouble meeting its short-term commitments.</td>
</tr>
<tr>
<td><strong>Communication Spending</strong></td>
<td>Quantifies the spending on Network Hardware, Wireless Hardware, and Data Communication.</td>
</tr>
<tr>
<td><strong>Corporate Financial Category</strong></td>
<td>Income statement cost categories used to help the IT team and stakeholders analyze the impact of IT on corporate financials, and to help compare current and planned performance versus peers. The Corporate Financial chart of accounts: Revenue (sales) COGS, S&amp;M, G&amp;A, R&amp;D, Interest Expense, Depreciation.</td>
</tr>
<tr>
<td><strong>Cost Center</strong></td>
<td>A cost center is a non-revenue-producing element of an organization, where costs are separately figured and allocated, and for which someone has formal organizational responsibility.</td>
</tr>
<tr>
<td><strong>Cost of Capital</strong></td>
<td>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 international financial lending metric. Formal Definition: Cost of Capital/Funds is the rate of return that a business could earn if it so chose other investments with the equivalent risks. Also can be stated as opportunity cost of the funds used due to the investment decision.</td>
</tr>
<tr>
<td><strong>Cumulative Benefits</strong></td>
<td>Over the analysis period, the cumulative benefits generated by the investment. For each year, the sum of the current and all prior years benefits.</td>
</tr>
<tr>
<td><strong>Current Ratio</strong></td>
<td>Calculates as assets divided by liabilities. This ratio determines if a company has sufficient level of liquidity to pay its liabilities. A ratio of 200% is preferred, and 100% is often considered the minimum.</td>
</tr>
<tr>
<td><strong>Cost of Goods Sold (COGS)</strong></td>
<td>An income statement expense on the corporate financials that reflects what it takes to produce the products sold. Formal Definition: COGS is a figure representing the cost of buying raw material and producing finished goods. Included are precise factors, i.e. material and factory labor; as well as others that are variable, such as factory overhead.</td>
</tr>
</tbody>
</table>
**Cost-Benefit Analysis**

A comparison of the project costs versus the projected benefits, analyzing the positive (benefits) and negative (costs) cash flows for the project. In generic terms, the tool uses ROI analysis to refer to what is more properly represented as a cost-benefit analysis.

Formal Definition: Cost-Benefit Analysis is the method of measuring the benefits anticipated from a decision by determining the cost of the decision, then deciding whether the benefit outweighs the cost of that decision.

**Cumulative Benefits**

Over the ROI 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 ROI 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.

**Data Center and Servers Spending**

Quantifies the spending on servers, storage, and backup/restore systems.

**Days Sales Outstanding (DSO)**

The Days Sales Outstanding (DSO) measure is calculated as the accounts receivable divided by revenue, then multiplied by the number of days in a year, 365. This metric is used to determine if there are collections issues. Note that this formula uses total revenue versus another method which uses credit sales.

**Declining-Balance Depreciation Method**

The declining-balance depreciation method is an accelerated depreciation method in which an asset's book value is multiplied by a constant depreciation rate (such as double the straight-line percentage, in the case of double-declining-balance.).

This depreciation method is allowed by the U.S. tax code and gives a larger depreciation in the early years of an asset. Unlike the straight line and the sum of the digits methods, both of which use the original basis to calculate the depreciation each year, the double declining balance uses a fixed percentage of the prior year's basis to calculate depreciation.

The percentage rate is $2/N$ where $N$ is the life of the asset. With this method, the basis never becomes zero. Consequently, it is standard practice to switch to another depreciation method as the basis decreases. Usually the taxpayer will convert to the straight line method when the annual depreciation from the declining balance becomes less than the straight line.

**Depreciation**

When a purchase is deemed a capital expense, usually when it exceeds a corporate accounting threshold, the cost of the asset, rather than being taken as an operating expense, is depreciated, whereby the cost of the item is expensed over time using one of several depreciation schedules. The cost of the asset is apportioned over a multi-year period to account for the fact that the purchase is a long-term tangible asset.

Formal Definition: Depreciation is the amount of expense charged against earnings by a company to write off the cost of a plant or machine over its useful live, giving consideration to wear and tear, obsolescence, and salvage value. If the expense is assumed to be incurred in equal amounts in each business period over the life of the asset, the depreciation method used is straight line (SL). If the expense is
assumed to be incurred in decreasing amounts in each business period over the life of the asset, the method used is said to be accelerated.

Two commonly used variations of the accelerated method of depreciating an asset are the sum-of-years digits (SYD) and the double-declining balance (DDB) methods. Frequently, accelerated depreciation is chosen for a business’ tax expense but straight line is chosen for its financial reporting purposes.

Development Spending
Quantifies the spending on Design, Development, and On-going Maintenance.

Direct Benefits
An IT centric term commonly used to describe benefits that directly impact the IT budget such as savings in staff labor costs, purchase avoidance and reductions in facilities overhead.

Direct IT Spending
Expenses made by an organization that have a direct impact on the bottom line. Expenditures include: capital hardware and labor software purchase, IT Operations and IT Administration Labor.

Discounted Cash Flow
Discounted cash flow is a valuation method best used to evaluate a business established for the purpose of fulfilling a specific project, in certain startup and other companies where cash flow is more important than net income, and when a certain time frame is set where an investor wishes to see his investment returned over a specific period of time. In discounted cash flow, the present value of liabilities is subtracted from the combined present value of cash flow and tangible assets, which determines the value of the business.

Discount Rate
Discount rate is the interest rate that the Federal Reserve of the U.S. Government charges a U.S. bank to borrow funds when a bank is temporarily short of funds. Collateral is necessary to borrow, and such borrowing is quite limited because the Fed views it as a privilege to be used to meet short-term liquidity needs, and not a device to increase earnings.

Distributed Processing Spending
Quantifies the spending on Personal Computers and Terminals, Handhelds and Printers.

Double Declining-Balance Depreciation Method (DDB)
Declining balance depreciation rate which is twice the straight-line rate. See "Declining-Balance Depreciation Method".

Earnings
The net profit of the corporation, calculated as before tax earnings using the formula:

\[ \text{Earnings} = \text{Net revenue} - \text{Operating expenses} + \text{Depreciation} \]

Also referred to as Net Income or the corporation’s “bottom line”.

Economic Value Add (EVA)
A standard indicator used by CFOs and executives to measure the true value a company derives from its operations. Measures the earnings of a company minus the “rent” it took to generate the earnings.
EVA = Net Profit – Cost of Capital \times (\text{total assets} - \text{total liabilities})

Formal Definition: EVA measures the difference between the return on a company’s capital and the cost of that capital. A positive EVA indicates that value has been created for shareholders; a negative EVA signifies value destruction.

**EVA per Employee**

The EVA / Employee Bar Chart graphs the comparative EVA per Employee for the company and the peers, where EVA = net profit - cost of capital (assets - liabilities). An important ratio for comparing companies in their ability to create value on a per employee basis.

**Facilities and Overhead Spending**

Quantifies the cost for IT facilities, supplies, power and other facilities and overhead spending.

**Financial Leverage Index**

Calculated as return on equity divided by return on assets. This ratio provides insight into the level of debt in relation to equity being used to fund a company’s operations.

**Full Time Equivalent (FTE)**

A measurement of the relative headcount which is applied to perform a particular task. FTEs can be specified as full headcounts or fractional headcounts. A full time person does not have to be assigned to the task on a full time basis, rather the time they work on the task divided by the work hours a typical person works per year. As an example, a PC technician spends 10 hours each work week performing support services on servers. Over the course of a year, working 47 weeks when holidays and vacations are excluded, this equates to a total of 470 hours. With 1880 hours worked per year per person on average (US), $\frac{470}{1880} = 0.25$. Therefore, .25 FTEs are allocated to this task.

**Future Value**

Future value is the amount of money that an investment made today (the present value) will grow to by some future date. Since money has time value, we naturally expect the future value to be greater than the present value. The difference between the two depends on the number of compounding periods involved and the going interest rate.

**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.

**General and Administrative (G&A) Expenses**

An income statement operating expense that reflects costs associated with business administration, typically including executives, overhead, information technology, administration, human resources and other costs not associated with COGS, sales and marketing, research and development, interest expenses and depreciation.

Formal Definition: G&A usually refers to the indirect overhead costs contained
Appendix A: Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal Financial Analysis</td>
<td>Horizontal Financial Analysis allows comparison of one company’s ratios to the ratios of other companies' as well as to average industrial ratios and internal industrial deviation of these ratios.</td>
</tr>
<tr>
<td>Hurdle Rate</td>
<td>The rate at which a project’s internal return on investment must exceed in order for the project to be deemed worthy of further investigation and investment. These hurdle rates vary dramatically. For non-risk adjusted ROIs, hurdle rates are typically 120% or more.</td>
</tr>
<tr>
<td>Income Statement</td>
<td>Part of a company's financial statements summarizing revenues and expenses during an annual period. The Income Statement is also referred to as the profit and loss statement. Income Statement items include: Revenue, COGS, Operating Expenses and Depreciation.</td>
</tr>
<tr>
<td>Indirect Benefits</td>
<td>An IT centric term that is commonly used to describe benefits that impact the business units, or corporate revenue, but do not directly impact the formal IT budget. These include increases in availability, increases in user productivity, increases in revenue, or decreases in cost of goods sold or operating expenses.</td>
</tr>
<tr>
<td>Indirect IT Spending</td>
<td>Unofficial and often hidden expenses by users on IT. These expenses include hidden purchases of computing equipment, peripherals, software and media on expense reports, time spent helping peers train or solve issues, programming and customization of applications, and self-learning.</td>
</tr>
<tr>
<td>Initial</td>
<td>The time period for initial investments - the one time costs related to the purchase of capital assets, and service fees.</td>
</tr>
<tr>
<td>Intangible Benefits</td>
<td>Benefits that are strategic benefits derived from the planned project, but not reliably quantifiable in absolute monetary terms. Instead, Key Performance Indicators are used to quantify the intangible benefits. Key Performance Indicators include business measures, metrics, or ratios which indicate how the company is performing on meeting strategic goals.</td>
</tr>
</tbody>
</table>

Intangible Benefits are typically categorized as follows:

- **Brand Advantage** - reinforcing, advancing or changing a company's brand. Example key performance indicators would include ratings such as brand loyalty and repeat customer rates.
- **Strategic Advantage** - working towards or meeting overall corporate objectives. Example key performance indicators would include key financial indicators such as
return on equity, days sales outstanding, inventory turns, sales productivity or other key financial performance measures.

- Competitive Advantage - releasing solutions faster, developing solutions less expensively, better addressing customer needs, meeting changing market demand, scaling easily and more cost effectively, and gaining market share. Example key performance indicators include market share, advertising and marketing effectiveness, new customer acquisition rates, and quality rankings.
- Intellectual Capital - increase in relevant knowledge gained by the staff, and the perceived market value from those gains. Example key performance indicators include including new product launch rates, product revenue shares (new vs. existing), patent filings, research and development expense ratios, and professional development.
- Organizational Advantage - enabling an organization to function more effectively, or reinforcing or recreating a corporate culture. Example key performance indicators include professional training and development metrics, project work and productivity metrics, service level metrics, satisfaction rankings, innovation and development metrics, and quality metrics.

**Interest Expense**
The cost to the corporation in interest payments for borrowing money.

**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.

In more technical terms, IRR is the DISCOUNT RATE which makes the NET PRESENT VALUE of a project equal to zero.

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.

**Inventory**
Inventory are the raw materials, work in process and finished goods recorded as an asset on the company’s balance sheet. A high inventory carries with it a cost to the company.

**Inventory Turns**
Inventory Turns is equal to the COGS divided by Inventory to form a ratio. This figure highlights the investment in inventory and the liquidity of this investment, as well as inventory management skill. Dividing 365 by the inventory turns figure generates the days of inventory on hand, which can sometimes be more meaningful.

**Inventory to Working**
Calculated as the inventory divided by working capital. Working capital is equal to
**Capital Ratio**

accounts receivable + inventory – accounts payable. This figure can highlight issues where inventory is too high a proportion of working capital due to slow turns or obsolete inventory levels, and highlight short term cash issues.

**IT Budget Category**

Used to categorize elements of the IT Operating Budget for budget planning and peer comparison. For a project ROI analysis, IT Budget Category is used to help categorize costs or benefits from a project, in order to determine the impact on IT Operating Expenses.

The chart of accounts includes: Data Center and Servers, Distributed Processing, Purchased Software, Purchased Services, Communications, Development, Maintenance, Operations, Overhead Supplies and Other.

**IT Cost Reduction Projects**

A strategic project classification reflecting IT focused initiatives which help to reduce IT Operating Expenses by increasing IT productivity, avoiding IT purchases, reducing fees and contracts or reducing IT headcount.

**IT Cost Reductions**

A project benefit used in calculating ROI. Calculates the increases in IT productivity, reduction in headcount, purchases, support, maintenance, contracts, facilities and overhead.

Savings get mapped to specific IT budget categories to analyze the impact on the IT Operating Budget, which includes the following categories: Data Center and Servers, Distributed Processing, Purchased Software, Purchased Services, Communications, Development, Maintenance, Operations, Overhead Supplies and Other.

As well, IT Cost Reductions affect the corporate budget, particularly helping to reduce IT expenditures contributing to General and Administrative and Depreciation.

**IT Costs**

The costs budgeted to IT for the planned project, and collected to perform an ROI Analysis. IT Costs represents one of two costs for a planned project, the other being Business Unit Costs.

The IT Costs typically include: Capital Purchases, Support and Maintenance Fees, Planning, Implementation and Development Labor, Training, Professional Services and Contractors, and Overhead.

The costs are typically allocated to an IT budget category, in one or more of the following chart of accounts: Data Center and Servers, Distributed Processing, Purchased Software, Purchased Services, Communications, Development, Maintenance, Operations, Overhead Supplies and Other.

**IT Innovation Spending**

The IT spending on truly new projects to help improve productivity, generate revenue, capture new markets or launch new businesses.

Does not include spending to maintain and operate existing systems, improve IT productivity on existing operations and maintenance, or perform migrations, consolidations or upgrades of existing systems.
**IT Operating Budget**
The forward looking planned expenditures for IT, grouped into the following chart of account categories: Data Center and Servers, Distributed Processing, Purchased Software, Purchased Services, Communications, Development, Maintenance, Operations, Overhead Supplies and Other.

**IT Operations and Administration Spending**
Quantifies the spending on Operations and Administration staff. IT Operations staff includes Level 1 Support, Level 2 Support, Level 3 / Dispatched Support, Performance and Availability, User Administration, Operating System Support, Maintenance, Software Deployment, Application Management, Systems Management, File and Storage Management, Security Management. IT Administration staff includes Asset Management, IT Finance (Audit, Chargeback, Budgeting), Purchasing and Procurement / Contracts, Vendor Management, IT Training (Course Development and Delivery), User Training (Course Development and Delivery), and Supervisory / Management.

**IT Spending per Employee**
Calculates the IT spending per employee. Higher spending per employee without subsequent performance / productivity gains today or in the future highlights inefficient spending.

**IT Spending per Knowledge worker**
Calculates the IT spending per knowledge worker. Higher spending per knowledge worker without subsequent performance gains today or in the future highlights inefficient spending.

**IT Spending Profile**
The IT Spending profile calculates the overall IT budget as a sum of the official IT budget, additional IT spending in the business units (Shadow IT), and indirect IT spending (self and peer support). When doing a detailed spending analysis, typically indirect IT spending is excluded, only accounting for IT spending in the official IT budget and business units.

**IT Value Chain Management**
Calculating the Value of IT has been a challenge for CIOs, who are responsible for managing costs and maximizing the impact of IT on the business, and for IT solution providers, who need to demonstrate that the investment in their solutions has made a positive impact on the organization. Record spending on IT, with companies showing little returns from these investments, has left a crisis of confidence in its wake.

To help companies analyze and manage the Value from IT, Alinean has developed a methodology, IT Value Chain Management, optimizing, measuring and managing the business impact of IT:

1) across the Business, from micro-economic analysis at the project level, to macro-economic analysis at the corporate financial level and

2) for all Stakeholders: from the Project and Business Unit Managers, Cx level executives and Directors, to the Shareholders, Customers and Supply Chain.

**Job Costing**
Job Costing is the allocation of all time, material and expenses to an individual project or job.

**Key Performance**
Key Performance Indicators are used to quantify the Intangible Benefits derived
Appendix A: Glossary

Indicators “KPIs”

from a project. Intangible Benefits are strategic benefits, which are not quantifiable in absolute monetary terms, but are quantifiable as key performance measures or metrics. These measures and metrics are used as a gauge to determine if specific project goals have been accomplished.

Formal Definition: Key Performance Indicators are those empirical data points that indicate how well, or poorly, an entity is performing against preset goals and objectives. Normally, in business or strategic planning, a company will set targets over a specified period that the business believes are attainable and track performance over time to those targets or objectives.

Knowledge Worker

A classification of a broad group of employees who used computers daily to perform tasks, create, collaborate, and process and route knowledge.

Liability

Liability in accounting, is a loan, expense, or any other form of claim on the assets of an entity that must be paid or otherwise honored by that entity.

Line Item Budget

Line Item Budget is a budget initiated by government entities in which budgeted financial statement elements are grouped by administrative entities and object. These budget item groups are usually presented in an incremental fashion that is in comparison to previous time periods. Line item budgets are also used in private industry for comparison and budgeting of selected object groups and their previous and future expenditure levels within an organization.

Mandatory Projects

A strategic project classification focused on meeting corporate governance rules, legal requirements, or other mandated initiative. These projects sometime include vendor mandates, such as migrating to a new platform due to lack of continued support.

Management Practices

See “Best Practices”

Net Assets

Calculated as total assets minus liabilities.

Net Present Value (NPV)

Net Present Value is 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. 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.

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. NPV calculation uses the
Appendix A: Glossary

**Net Tangible Benefits**
An analysis of the financial viability of a project. Net Tangible Benefits compares costs versus savings to generate key financial metrics, including ROI, NPV, IRR and payback period.

**Official IT Budget**
The Official IT Budget represents spending which is controlled and allocated to the IT department. This spending is grouped into the following chart of account categories: Data Center and Servers, Distributed Processing, Purchased Software, Purchased Services, Communications, Development, Maintenance, Operations, Overhead Supplies and Other.

The Official IT Budget does not include Business Unit IT Spending, which is accounted for in the business unit operating budget, and hidden Indirect IT spending, unofficial spending of time and reimbursed expenses on IT.

**Operating Expenses**
An income statement term that refers to the essential items a company spends money on in order to remain in business. These expenses include labor and fees for sales and marketing, general and administrative, research and development and interest expenses.

Depreciation and Cost of Goods Sold are not included in the calculation of Operating Expenses.

**Opportunity Cost**
Cost of the foregone opportunity from an alternative use of a resource. As an example, a building that has been paid for still has an opportunity cost in that the owner is foregoing the opportunity to either rent or sell the building.

**Formula**:

\[ NPV = Initial\ expense + \text{discounted Cash Flow (Expected Benefits – Expected Costs)} \text{ for Year 1} + \ldots + \text{discounted Cash Flow (Expected Benefits – Expected Costs)} \text{ for Year N} \]

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.

**Formal Definition**: NPV is a method used in evaluating investments, whereby the net present value of all cash outflows (such as the cost of the investment) and cash inflows (returns) is calculated using a given discount rate, usually REQUIRED RATE OF RETURN. An investment is acceptable if the NPV is positive. In capital budgeting, the discount rate used is called the HURDLE RATE and is usually equal to the INCREMENTAL COST OF CAPITAL.

**Opportunity Cost**

Cost of the foregone opportunity from an alternative use of a resource. As an example, a building that has been paid for still has an opportunity cost in that the owner is foregoing the opportunity to either rent or sell the building.

**Formal Definition**: Opportunity Cost is widely used in business planning in evaluating capital investment. A company measures the projected return against the anticipated return it would receive on a highest yielding alternative investment that contains a similar risk profile.
<table>
<thead>
<tr>
<th>Glossary Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payback Period</td>
<td>Payback Period, in capital budgeting, is the length of time needed to recoup the cost of CAPITAL INVESTMENT. The payback period is the ratio of the initial investment (cash outlay, regardless of the source of the cash) to the annual cash inflows for the recovery period.</td>
</tr>
<tr>
<td></td>
<td>The major shortcoming for the payback period method is that it does not take into account cash flows after the payback period and is therefore not a measure of the profitability of an investment project. For this reason, analysts generally prefer the DISCOUNTED CASH FLOW methods of capital budgeting; primarily, the INTERNAL RATE OF RETURN and the NET PRESENT VALUE methods. The payback period is measured from the start of the project, until the occurrence when the cumulative benefits exceed the cumulative costs. 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 timeline 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.</td>
</tr>
<tr>
<td>Period of Analysis</td>
<td>The period of analysis for ROI business cases, set at three years for most projects.</td>
</tr>
<tr>
<td>Profit Before Taxes</td>
<td>Profit Before Taxes is operating profit minus all other expenses (net).</td>
</tr>
<tr>
<td>Proposed Plan</td>
<td>The proposed financial plan with the costs and benefits of the planned projects simulated against the base case financials.</td>
</tr>
<tr>
<td>Purchased Services Spending</td>
<td>Quantifies the spending on Hardware Break-Fix Support, Software Maintenance, Business Consulting, IT Operations and Administration Services and Managed Services.</td>
</tr>
<tr>
<td>Realized Benefits</td>
<td>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.</td>
</tr>
<tr>
<td>Research and Development (R&amp;D)</td>
<td>An income statement operating expense that reflects the costs of research and development, the investments in developing new intellectual property, products or procedures.</td>
</tr>
</tbody>
</table>
Residual Values/Options  At the end of the analysis period, three years for ROI analysis, the value remaining in the solution for the rest of the solutions life, minus any costs to obtain such ongoing value. Value can be the net benefits expected over the remaining useful life (beyond Year 3), or can be the option value of implementing the solution (the incremental upgrade costs that are avoided by moving to the new platform today, versus in the future). Residual Values/Options are specified as Year 3 benefits, and are risk adjusted, and discounted in the NPV savings calculations.

Return on Assets  A financial ratio used to calculate the financial benefits that are derived from the purchased assets, represented as

\[
\text{ROA} = \frac{\text{Net Income}}{\text{Total Assets}}
\]

For IT, ROA is often is used to describe the Return on Total Assets, which represents the total benefits being derived by the asset, divided by the total investment in the asset. This approach helps to measure the long term benefits of large infrastructure asset investments such as data warehouses or ERP systems, especially those assets that are enhanced over time.

Return on Equity  A measure of a corporation’s profitability, calculated as net income divided by shareholder’s equity.

\[
\text{Return on Equity} = \frac{\text{Net Income}}{\text{Shareholder's Equity}}
\]

Return on Equity is used most often to compare the profitability performance of a company to other firms in the same industry – determining who is most productively generating income from net assets.

Formal Definition: ROE measures the overall efficiency of the firm in managing its total investments in assets and in generating a return to stockholders. It is the primary measure of how well management is running the company.

ROE allows you to quickly gauge whether a company is a value creator or a cash consumer. By relating the earnings generated to the shareholders’ equity, you can see how much cash is created from the existing assets. Clearly, all things being equal, the higher a company’s ROE, the better the company.

Return on Investment (ROI)  ROI is the ratio of the net gain from a proposed project, divided by its total costs. In a formula, this can be represented as:

\[
\text{ROI} = \frac{\text{cumulative net benefit}}{\text{total costs}}
\]

When calculated, ROI is represented as a percentage demonstrating the value of the investment comparing costs to net benefits.

As an example of how the ROI formula can be used to evaluate a solution, if a project has an ROI of 200%, the total net benefits derived from the project are double those of the expected total costs to implement the project. This means that every one dollar invested in the project returns a net benefit of $2 in return, plus the original dollar invested. As such, the ROI calculation represents the relative value of the project’s cumulative net benefits over the analysis period, divided by the project’s cumulative costs, expressed as a percentage.
The ROI calculation does not use net present value terms in its calculations.

### Revenue per Employee
An important ratio that looks at a company’s sales in relation to the number of employees they have. It is calculated as: Revenue Per Employee = Revenue / Number of Employees. This ratio is extremely useful when compared against other companies in the same industry. Ideally, a company wants the highest revenue per employee possible, as it denotes higher productivity.

### Revenue (Sales)
The dollar amount of sales during an annual period, including gross sales, discounts and returns.

Revenue is often called the "top line" from which cost of goods sold is subtracted to calculate net revenue, and operating expenses and depreciation are subtracted to determine before-tax earnings.

Formal Definition: Revenue is the monetary amount of annual sales, including returned merchandise and discounts, i.e., it is the top monetary figure from which costs are subtracted to determine net income.

### Risk Adjusted Discount Rate
The discount rate used in Net Present Value calculations within the ROI analysis. The discount rate takes the company’s cost of capital and adjusts it upwards to account for Project Risk. A higher discount rate is automatically set when the project risk assessment represents a risky project, discounting future cash flows in the NPV and Risk Adjusted ROI calculations.

### Risk Adjusted Discounted Cash Flow Analysis
A financial analysis method which factors risk into the analysis of net tangible benefits.

Uses a risk adjusted discount rate to factor project risk into the financial calculation of net present value. Discounts future cash flows using a higher discount rate than the nominal cost of capital rate used in standard present value calculations. This higher risk adjusted rate is used to discount future cash flows to account for uncertainty in assumptions and possible issues in controlling costs or realizing returns.

### Risk Adjusted Return
Risk Adjusted Return is when we subtract from the rate of return on an asset a rate of return from another asset that has similar risk. This gives an abnormal rate of return that shows how the asset performed over and above a benchmark asset with the same risk. We can also use the beta against the benchmark to calculate an alpha which is also risk adjusted performance.

### Risk Adjusted Return on Investment (ROI)
Risk Adjusted ROI is the ratio of the net present value of the net gain from a proposed project, divided by the net present value of its total costs. In a formula, this can be represented as:

\[
\text{Risk Adjusted ROI} = \frac{\text{Net Present Value Cumulative Net Benefit}}{\text{Net Present Value of Total Costs}}
\]

### Risk Assessment
Quantifies the potential issues a project might have, particularly those issues which may affect achievement of cost, benefit or strategic goals.
The risk assessment consists of listing each possible risk, and quantifying the likelihood of occurrence and potential impact, to create a risk assessment score. The score is used to adjust the discount rate, in order to calculate a risk adjusted discounted cash flow analysis. Typical project risks include:

> Labor Resources - the risk that required resources may not be available, not have the proper skill set or training, or rely on a small group of experts that cannot be retained easily.

> 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 family of dependent projects, such as delays, resources or budgets.

**Risk Impact Scalars**

Used to translate a Risk Assessment score (factoring the probability a risk will occur, and the potential impact should it occur) into an incremental adjustment to the cost of capital rate – the risk adjusted discount rate.

**Risk Mitigation**

Tools and management processes that are implemented to help reduce the potential issues that might affect the project’s success including budget, schedule,
requirements and realization of expected returns.

**ROI Worksheets**
A set of ROI components which help to calculate a specific cost or benefit in a business case. These worksheets are used as building block objects to create business cases. These worksheets are stored in a library and can be used to build customized ROI analyses or templates, or as a starting point for creating customized worksheets in Excel.

**ROI Dashboard**
A model developed by Alinean to enhance traditional ROI analysis and make it more suitable to the analysis of Information Technology solutions. ROI Dashboard is used effectively to analyze the viability of a project, and to help stack rank projects competitively for optimal selection.

ROI Dashboard includes traditional financial analysis, the calculation of net tangible benefits, including ROI, NPV, IRR and payback period.

ROI Dashboard extends traditional ROI analysis to include Risk Assessment and risk adjusted discounted cash flow analysis, as well as intangible benefits (key performance indicators).

**ROI Selling**
A solution selling approach which uses ROI to develop a quantified cost-benefit analysis for the prospect. ROI selling helps prospects build conservative business cases for implementing a proposed solution, helping the prospect uncover the current costs, and documenting the implementation costs cost savings, strategic benefits and risks.

**ROI Templates**
A set of pre-built ROI analyses for the most popular IT projects. Contains all of the costs, tangible benefits, intangible benefits and risks which the team should consider. Default metrics are provided for typical projects, and these can be easily customized to create personalized business cases.

**Salary Increases**
Salary increases are used to factor the impact of future increases in labor costs. The salary increases are applied to future years subsequent to year one for an analysis on a compound basis.

**Sales and Marketing Expenses**
An income statement operating expense that reflects the costs of selling and marketing the products, typically including sales and marketing labor, expenses and advertising.

**Sales to Assets Ratio**
The sales to assets ratio is calculated as sales revenue / assets. This is a good efficiency measure when comparing companies to see who is generating more sales revenue from fewer or superior asset utilization, or who will need higher asset investments to grow.

**Sales General and Administrative (SG&A) Expenses**
An income statement operating expense which combines sales, marketing, general and administrative expenses.

Formal Definition: SG&A refers to the indirect overhead costs contained within the Sales, General and Administrative expense / cost categories.
<table>
<thead>
<tr>
<th><strong>Sales to Inventory Ratio</strong></th>
<th>The sales to inventory ratio is calculated as sales revenue divided by inventory. This ratio indicates the level of inventory needed to generate a particular level of sales.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Salvage Value</strong></td>
<td>The residual value of an asset at the end of its useful life usually assessed at a small fraction of the original purchase price for IT assets (see Residual Value/Options for assessing IT investments that have additional value at the end of the analysis period).</td>
</tr>
<tr>
<td><strong>Sensitivity Analysis</strong></td>
<td>Process by which the crucial elements of a business case are analyzed to determine how changes to these elements due to risk and uncertainties in forecasting, will affect the results.</td>
</tr>
<tr>
<td><strong>Shareholders' Equity</strong></td>
<td>A balance sheet metric that records the investment capital received from investors in exchange for stock (paid-in capital), donated capital, and retained earnings. This is equal to: Shareholders' Equity = Total Assets – Total Liabilities. Stockholders’ equity is often referred to as the book value of the company. Formal Definition: Shareholders’ equity is total assets minus total liabilities. It is the same as EQUITY, NET WORTH and stockholder’s equity.</td>
</tr>
<tr>
<td><strong>SIC Codes</strong></td>
<td>A standard series of 4-digit codes that are used to categorize business activities into standard industry classifications.</td>
</tr>
<tr>
<td><strong>Stakeholder</strong></td>
<td>Any person whose actions affect the business, or whose actions are effected by the business. Principle stakeholders in IT include the IT staff, business unit managers, employees, executives, directors, customers, shareholders/investors and supply chain.</td>
</tr>
<tr>
<td><strong>Straight-Line Depreciation Method</strong></td>
<td>Straight-line (SL) depreciation method allows an equal amount to be charged as depreciation for each year of the expected use of the asset. It is computed by dividing the adjusted basis of a property by the estimated number of years of remaining useful life.</td>
</tr>
<tr>
<td><strong>Strategic Plan</strong></td>
<td>A plan outlining the overall direction for the business and organization, establishing the mission, vision, goals, measures and strategies for important initiatives.</td>
</tr>
<tr>
<td><strong>Sum-of-the-Years Digits</strong></td>
<td>SYD is the accelerated depreciation method in which a constant balance (cost minus salvage value) is multiplied by a declining depreciation rate.</td>
</tr>
<tr>
<td><strong>(SYD)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Sunk Costs</strong></td>
<td>Investments made in a project or assets in prior periods, and which are not being considered as part of the current analysis.</td>
</tr>
<tr>
<td><strong>Tangible Benefits</strong></td>
<td>Tangible Benefits are benefits which can be quantified reliably into absolute monetary terms. The benefits typically include productivity improvements, purchase</td>
</tr>
<tr>
<td>Glossary Term</td>
<td>Definition</td>
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<td>--------------------------------------</td>
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</tr>
<tr>
<td><strong>Avoidance</strong></td>
<td>Avoidance can refer to activities that are designed to prevent or mitigate risk, such as insurance policies or safety regulations. It can also refer to strategies that reduce the impact of a risk, such as diversification or hedging. Avoidance strategies can provide revenue improvements.</td>
</tr>
<tr>
<td><strong>Total Assets</strong></td>
<td>A purchased item that maintains an existing economic value to the corporation. The Total Assets are represented as a balance sheet item showing what a firm owns. Assets are purchased to increase the value of a firm or to benefit the firm’s operations. Some examples are cash, accounts receivable, inventory, real estate, and securities.</td>
</tr>
<tr>
<td><strong>Total Cost of Ownership (TCO)</strong></td>
<td>Quantifies the total cost of an asset throughout its useful life (life cycle costs), including acquisition costs, labor, hidden cost and availability.</td>
</tr>
<tr>
<td><strong>Total IT Spending</strong></td>
<td>Total IT Spending reflects the sum of the official IT spending, as reflected in the IT Operating Budget, Business Unit IT Spending on IT, including budgeted labor, training, and purchases, as well as Indirect IT Spending, unofficial and often hidden spending on IT by users including un-official purchases of items such as handheld computers, peripherals and media, as well as time spent on peer support and learning.</td>
</tr>
<tr>
<td><strong>Total Liabilities</strong></td>
<td>A balance sheet item used to specify the company’s legal debts and obligations. Typically, liabilities are estimated via accrual accounting. Liabilities include: loans, accounts payable, mortgages, deferred revenues and accrued expenses. For example, the unpaid value of a mortgage or outstanding money owed to suppliers would be considered a liability.</td>
</tr>
<tr>
<td><strong>Value</strong></td>
<td>Value is a measure of performance and there is no one single metric that can be relied upon to perform value assessment of IT. From a macro-economic standpoint value is most typically measured using key performance indicators such as return on equity, EVA, return on assets, revenue growth, profitability and shareholder value.</td>
</tr>
<tr>
<td><strong>Working Capital Productivity</strong></td>
<td>The working capital productivity ratio compares sales revenue to working capital, calculated as sales divided by working capital, where working capital is defined as accounts receivable + inventory – accounts payable. This measures the needed cash to generate a specific level of sales. This is a good efficiency measure when comparing companies to see who is generating more sales revenue from lower working capital requirements, or who needs more working capital to generate more revenue.</td>
</tr>
<tr>
<td><strong>Workforce IT Spending</strong></td>
<td>The Workforce IT Spending compares the IT spending estimates per employee and per knowledge worker. Higher spending per employee or knowledge worker without subsequent performance/productivity gains today or in the future highlights inefficient spending.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>---------------------------</td>
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</tr>
<tr>
<td>X-Efficiency</td>
<td>X-Efficiency is the ability for a company or organization to minimize costs and maximize returns.</td>
</tr>
<tr>
<td>Year 1 through Year 3</td>
<td>The annual analysis periods, measured in cumulative 12 month periods from project start.</td>
</tr>
<tr>
<td>Zero Based Budget</td>
<td>Zero Based Budget is where the expenses or costs of the prior year are not taken into consideration when establishing expense or budgetary levels looking forward. Each expense category starts from zero. All expenses or cost levels within the budget must be justified or re-justified as being necessary; thus “zero-base”.</td>
</tr>
</tbody>
</table>
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An online resource center for ROI and TCO related studies; articles, white papers and tools can be found at http://www.alinear.com.