



Return on Investment

Ideas for Today and Tomorrow

Why Measure

Why measure the value of technology

In the "old days," the technology choice was limited and the decision was often obvious. It made sense to anyone that moving from a mechanical typewriter to Microsoft Word would have a positive impact on the bottom line.

CFOs and IT decision makers

Today companies face a number of choices, and often these choices have subtle differences in capabilities, strengths, and weaknesses. It is not always obvious which technology is the best for your situation, or even whether you should replace an existing solution or wait.

For example, will Microsoft Office XP provide enough positive impact on the corporate bottom line to justify deploying it as a replacement for Microsoft Office 2000?



For most companies, the answer is yes but for others, the answer may be no, or to take a more measured approach to a deployment. Only financial analysis provides a basis for a sound business decision.

Return on Investment Ground Rules

Before embarking on an ROI effort, you need to keep some basic ground rules in mind.

First, ROI is best used to compare potential projects with other internal decisions and success factors - *NOT* with those of other companies! An organization moving from stone tablets to electronic document management will achieve a higher ROI than an organization changing from one document management vendor to another. This doesn't mean you did a better or worse job; it just shows the magnitude of the change.

Second, develop a standard methodology and make that part of every technology review and investment. The more ROI calculations you do, the better you become.

The ROI Calculation

You'll need to understand a little about ROI and payback period, but don't worry—you don't need to be a finance expert. In fact, the Nucleus financial modeling tools automatically calculate both ROI and payback period along with net present value (NPV) and internal rate of return (IRR), so you can put the calculator away.

Return on investment is the average of the net benefits divided by the initial cost of the project, times 100. For instance, if a project cost \$50 and returned \$100 in the first year, the ROI in the first year would be $100/50$, or 200%.

Unfortunately, technology rarely covers its costs in the first year, so a more accurate calculation uses a 3-year horizon. All Nucleus workbooks use a 3-year horizon.

With a 3-year horizon, the ROI calculation is now the average net benefit (benefit less any additional cost) per year divided by three then divided by the initial cost, times 100, or:

$$\text{ROI} = ((\text{net year 1} + \text{net year 2} + \text{net year 3}) / 3 / \text{initial cost}) \times 100$$

Why use an average annual number rather than add the cumulative benefits from all three years then divide by the initial cost? Using an average ROI calculation yields numbers that are directly comparable to those you would find with other corporate investments, the cost of capital, or a simple bank certificate of deposit.

Payback Period

OK, so just how long will it be before this project covers its costs? This is an important question, and in many cases, payback may be more important than ROI. Payback period provides an indicator of risk and gives you insight into your flexibility.

Payback period is the point at which total benefits equal total costs.

To calculate payback period if the initial year cost is less than the year 1 benefit, simply divide the initial cost by the year 1 benefit. For example, assume you have the following cash flow scenario:

Initial	Year 1	Year 2	Year 3
cost: 100	benefit: 200	benefit: 300	benefit: 400

The payback period is half a year ($100/200$). If we now change the initial cost to be 300, the process to calculate payback period changes to:

Initial	Year 1	Year 2	Year 3
cost: 300	benefit: 200	benefit: 300	benefit: 400

In the first year, you spend 300 but get 200, so you are out 100 at the end of the year. In the second year, you start off out 100 but make 300, so $(100/300) = 1/3$ of a year, plus the initial year gives you a payback period of 1 and $1/3$ years.

Payback Period

Why is payback important? Consider this scenario: You've just deployed the perfect Web site with e-commerce links to all your legacy systems. It took you a year and cost a bundle, but you've beat everyone else to the market. Your 3-year ROI will be 1000%, but the payback period is 2 years, meaning you won't cover your cost for some time. What if the next morning, you find a new development tool that lets you and all your competitors create a better application in a matter of minutes? You know you should use this tool to redesign your site, but you still haven't covered your initial costs.

What's the lesson here? No matter how attractive the ROI and how good the NPV, never get stuck with decision that has a long payback period. Technology moves too rapidly. Be flexible enough to discard a technology decision when a superior solution comes along.

Before You Start

Before you begin gathering the data, pick a start date for the project. It can be any date, but you need to define a point that starts year 1. You must now consider all costs and savings before the start date as occurring in the initial year; everything after that date should be considered spent or saved in year 1, year 2, or year 3.

Next, pick an average fully loaded cost per employee. You'll use this to number calculate the cost of the time spent on the project and also the time saved by employees. You can use more than one category of employee; just be sure to choose an average fully loaded cost for each category.

Gathering Cost

Gathering the cost information is usually the easy part. Most people know what they are planning to spend, so adding it up won't be too difficult. Unfortunately, it's easy to get confused and start including costs that are not directly associated with the project. Here are the rules to follow:

- Count everything that is directly associated with the project. (I purchased a new server for this project)
- Don't count infrastructure items not associated with the project. (I leveraged the existing network servers)
- Do count infrastructure items that were driven by the project. (The company purchased a server because of this project and two others like it; include 1/3 of the cost)

Cost Categories

Fortunately, there are only six categories of cost. If you run through these in order, you're unlikely to miss anything. Keep in mind that some costs are one time and others are recurring. For instance, you purchase hardware once but pay maintenance on it every year.

Software. This includes all software purchased for the project as well as the ongoing cost of maintenance.

Hardware. As with software, include all of the costs and be sure to include maintenance. If you plan to depreciate hardware (or software), gather the total cost and the depreciation amount at each year (for 5-year straight line, it's 20% per year).

Personnel. Calculate the number of hours of internal personnel time and multiply that by the fully loaded cost.

Consulting. If you hired outside help, here's the place to include it. Don't forget, consultants have a way of returning year after year.

Training. How many employees spent how many hours in training? Multiply this by the fully loaded cost. Include items such as trainer time and airfare.

Other. The catch-all category. Here's where you come clean about that user conference you plan to attend in Bermuda.

That's it for cost. Gather all the data and place it in the appropriate years in the workbook.

Direct Benefits

Now comes the hard part. What's the real benefit to using the technology you're planning to deploy, and how do you measure that benefit?

First, there are two types of benefits: direct and indirect. Direct benefits include items such as decreasing paper costs, reducing accounts receivable, limiting express mail, reducing or reassigning staff, selling old hardware, etc. These are savings you can "touch." There is no easy list for these, so think hard about your particular situation.

Nucleus reports examine these savings in depth and the financial modeling tool provides an outline you can follow. Keep in mind that some savings are one time (selling old hardware) while others are recurring (reducing staff). Recurring savings should be included in every year.

Place these direct savings in the proper years (initial year, year 1, year 2, and year 3).

Indirect Benefits

Here's where things get really tough. How do you measure indirect savings? If an employee saves time or is more productive, what's that worth to the company?

Examples of indirect savings include "reducing the time needed to test new software by 25%" or "the financial audit now takes 1 week rather than 3 weeks." Be careful here. If you expect the company to increase sales by 10% because of the new sales support system, don't include both the profit on the increased sales and the value of your salespeople becoming 10% more efficient. You should reasonably expect that the increased salesperson efficiency causes the increase in profit. It's always better to count the more direct result (profit) rather than the indirect result (increased productivity). Unfortunately, in many cases, you need to look at this indirect change.

Indirect Benefits

Here are the steps to follow when you are faced with assessing the value of an indirect benefit:

- Measure or estimate the expected change in time or productivity. For example, you estimate 1000 employees will save 10 minutes per year. That's 166.6 hours.
- Correct this amount based on inefficient transfer of time. For example, if you save an hour, you probably work only an additional 1/2 hour. This is a 0.5 correction factor. Nucleus uses a database of correction factors; pick one that seems right for your company (0.5 is a good guess if you're not sure). Now 166.6 hours saved becomes 83.3 additional hours worked.
- Multiply the gain by the fully loaded cost of an employee to calculate the value of the benefit. If you are using multiple loaded costs, do this calculation for each category of employee.
- After the project is implemented, go back and look for a corroborating measurement. For example, if you estimated the legal department would save 10% of their time:
 - Did they fire 10% of the lawyers?
 - Did the legal department grow at a rate slower than the rate for the rest of the organization?
 - Are the lawyers 10% more productive?

Calculating ROI and other metrics

- Now that you've gathered data on the costs and savings, you can place each in the appropriate year. If you are using the financial modeling tool, the results are generated for you. Otherwise, get out your calculator and calculate the net values at the initial year and each of the subsequent years. Now calculate ROI using the formula we covered earlier:

$$\text{ROI} = ((\text{net year 1} + \text{net year 2} + \text{net year 3}) / 3 / \text{initial cost}) \times 100$$

- Payback period is a little more difficult to calculate, but as we mentioned earlier, it is a very important indicator of risk. Follow the formula we covered earlier.
- If you are concerned about the after-tax ROI, be sure to use the Nucleus modeling tool. This will calculate the payback period and will adjust for the tax rate and discount rate. The discussion on taxes is far more detailed than can be covered here.

Summary

As you've seen, calculating ROI isn't difficult, just structured. Keep in mind a few points when embarking on an ROI calculation:

- Use a 3-year horizon and calculate ROI using the average savings over the 3-year period divided by the initial cost.
- Payback is an indicator of risk – the shorter the payback, the better off you are.
- Don't get misled and include costs that are not associated with the project. Conservative estimates are good, but resist the temptation to add so many costs that you talk yourself out of potentially good projects.
- There are only six categories of cost, and both costs and savings can be one-time or recurring.
- Benefits can be either direct or indirect. Direct benefits are good, but don't overlook indirect benefits.
- Fairly assess indirect benefits by correcting productivity gains for inefficient transfer of time.
- Choose a consistent methodology and apply it to every technology decision.