

The ROI Primer

As the computer virus is the nemesis of the Exchange Administrator and the software bug is the nemesis of the coder, a pesky financial metric known as Return On Investment (“ROI”) is often the nemesis of the CIO.

Although many CIOs are convinced that ROI is not an appropriate way to measure the value of an IT project, it still remains one of the most commonly used metrics. Business and financial leaders / managers often still require it before they approve project funding.

CIOs know they must understand ROI if they have any hope of helping other business / managers leaders understand why the ROI needs to be used with caution—especially when evaluating IT projects.

We will review how to calculate ROI, and we will outline a few examples of this metric's key drawbacks.

ROI Definition

In its simplest terms: If we pay for this, what do we get for the money we spent? Figure A displays the basic formula for ROI.

Figure A

| Calculations for ROI |
|--|
| ROI = Return/Assets invested |
| ▶ Return is the net gain, so you must subtract the expenses associated with the project. |
| ▶ Assets are all of the upfront costs incurred for the project. |

Case Study using ROI

To illustrate ROI, let's review a hypothetical Case Study in which Company

XYZ wants to buy a new server. This example is a revenue-generating capital project for an IT department (see Figure B). The return and investment figures are as follows:

- The equipment cost is \$100,000. Installation is \$50,000, and maintenance is \$10,000 per year.
- The server has a useful life of eight years. (While this lifespan is not typical of most servers, we will use this number just for this example.)
- The company will need to add another Account Executive (\$35,000 salary per year in this example), but it expects sales to increase by \$70,000 each year.

Figure B

| Buying a server: Return and investment calculations | | | |
|---|-----------------|------------------------------------|------------------|
| Annual return | | Assets invested | |
| Increased sales | \$70,000 | Equipment | \$100,000 |
| Additional personnel | -\$35,000 | Installation expense | \$50,000 |
| Maintenance expense | -\$10,000 | | |
| Total annual return | \$25,000 | Total assets invested | \$150,000 |

Be advised that this example is oversimplified. An organization may require many more figures to calculate return or assets invested. For example, some businesses include tax savings or overhead savings when calculating return.

Determine the Present Value ("PV") of money

After you calculate the return and the assets invested, it would seem that you have the necessary figures to determine ROI, which is return divided by the assets invested.

However, it is recommended that you also factor in the time value of money ("TVM") before you calculate the annual returns expected on the project. It's

a step that is typically recommended but often neglected.

Calculating the TVM takes into account the impact of inflation on future returns. The \$25,000 cash inflow that Company XYZ expects to receive each year is not worth the same amount each year. Remember, the server is expected to last eight years, so the \$25,000 cash inflow that our example company will receive eight years from now will be worth much less compared to the \$25,000 that we receive this year (see Figure C).

Figure C

| Cash flow and the time value of money | | | | | | | | |
|--|-------|-------|-------|-------|-------|-------|-------|-------|
| P0 | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 |
| -\$150K | \$25K | \$25K | \$25K | \$25K | \$25K | \$25K | \$25K | \$25K |
| <ul style="list-style-type: none">▶ The future cash inflows must be discounted back to their true value in the initial period.▶ "P0" represents "period zero," or the starting point of the project, at which time \$150,000 of assets were invested. P1, P2, etc., represent each following year of the eight years of the life of the server.▶ The discount rate used to determine the present value of the inflows is the company's cost of capital—what the company can earn off its money if it is invested elsewhere.▶ If we assume a 6 percent discount rate, the return would be \$164,559. | | | | | | | | |

So how do you calculate the TVM in order to arrive at the \$164,559 return figure? Here are two quick-and-easy methods that are commonly used:

- Use a financial calculator, such as the Texas Instruments BAII Plus or Hewlett-Packard 10B financial calculators. (For a helpful tutorial on using an HP financial calculator, check out the [Calculator Tutorials Index](#) on the Metropolitan State College of Denver Web site.)

Use the TVM calculator that's provided in Excel (see Figures D and E).

Figure D

| Calculating ROI and the time value of money in Microsoft Excel | | |
|--|-------------|---|
| | | Notes: |
| Investment | \$ 150,000 | Total cash invested up front |
| Payment | \$ (25,000) | Cash inflows are considered negative payments |
| Annual cost of capital | 6% | Interest rate per period (in this case, per year) |
| Years | 8 | |
| Timing of payment | 1 | 1 = at beginning of period; 0 = at end of period |
| Present value of cash inflows | \$164,560 | The value today of \$25K earned annually for the next eight years |
| ROI | 9.7% | |
| The present value of a stream of future cash flows depends on: | | |
| <ol style="list-style-type: none"> 1) The size of the cash flow (cash paid or cash received). 2) The company's cost of capital (what the company can earn if it invested its money in other places). 3) The length of time the payments are made. 4) The timing of the payments (beginning vs. end of the period). | | |
| | | Use Excel's Present Value Formula in this cell. (See Figure E.) |

Figure E

PV

PV

Rate = number

Nper = number

Pmt = number

Fv = number

Type = number

In this example, does not apply

=

Returns the present value of an investment: the total amount that a series of future payments is worth now.

Rate is the interest rate per period.

Formula result =

OK Cancel

This is Excel's Present Value (PV) formula that you'll use for the calculation in the cell described in Figure D. To find this formula, click on *fx* on the

toolbar and locate PV from the drop-down menu.

Plug in your numbers to calculate ROI. With the returns and assets calculated, we can use our figures in the formula to arrive at ROI for the server project (see Figure F).

Figure F

| Final calculations for ROI for Company XYZ's server |
|---|
| ROI = Return/Assets invested |
| \$164,559/\$150,000 |
| ROI = 9.7% |

The limitations of calculating ROI for IT projects.

If the financial gurus and business leaders in an organization are like most, they would prefer to have ROI calculated for just about every project.

The reason that it's so popular to look at IT projects [by ROI] is because it boils everything down into similar metrics, so everybody gets a percentage ROI, and it's really easy to compare different projects.

You are cautioned that calculating ROI for IT projects has a long list of disadvantages. We'll review some of these problems below.

ROI is a metric that favors cost-saving projects.

ROI calculations for cost-saving projects are more accurate because the enterprise already has the data needed for the equation. When calculating ROI for a revenue-generating project, estimates are often used, which makes the ROI calculation less accurate. The result is that *revenue-generating projects are at a disadvantage if they are competing against*

cost-savings projects based on ROI.

ROI cannot calculate valuable, intangible qualities. One metric can't characterize the entire value of a project. It is recommended that, when a CIO is faced with justifying an IT project, he or she should remind business leaders of the overall impact it will have for the enterprise.

You really need to look at things like: How does this project fit strategically with your business? Is this going to position you for better growth or make you a first mover in the market? You may not be able to measure what those exact benefits are.

For example, a research-and-development project may not show direct returns, but there is no doubt that not investing in R&D will hinder the long-term success of the enterprise.

IT will most likely be charged for project costs. Depending on how your organization assigns costs, it may be difficult for IT to charge a project cost to a particular department—especially when a project benefits the entire enterprise.

In the example of Company XYZ's new server, it is likely that the sales department wouldn't accept being charged for the cost of the new server, although Account Executives would likely benefit the most from it.

When Account Executives completed their budget, they assumed they would have the server all year long, and they built their sales projects based on that. Well, when IT built their budget, they didn't know about this project. They didn't think they had to include it in their budget.

Keeping ROI in perspective

I recommend that CIOs, who don't wish to use ROI, work with the company CFO or financial department to find an appropriate alternative metric to measure IT projects. Such alternatives include calculating one of the following:

- Payback
- Net present value
- Total cost of ownership

But don't be surprised if the financial team views any alternative metric as subordinate to ROI. In some organizations, ROI will remain a required figure for any project.

Remember: You will never get a financial person to approve a project without a metric or number behind it and you cannot manage what you can't measure.