Business School Basics:

Evaluating Technology Purchases Using Net Present

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Most call centers acquire new technology and fund new initiatives with capital dollars. The smart call center manager knows how to develop an effective business case to gain approval for the use of these funds. This article will provide an overview of the concept of net present value and how it is applied in calculating payback period and evaluating whether to purchase or lease new call center technology.

Models For Decision Making

Cost justification, or the calculation of savings/benefits, can be accomplished several ways. The two most common methods are return on investment (ROI) and payback period. To be calculated accurately, both of these models require the calculation of net present value (NPV). NPV takes into account the time value of money and is the model your CFO uses to evaluate if an investment is worthwhile enough to warrant the use of the company's money.

It's important to be able to calculate payback period and ROI using NPV so you can evaluate vendor proposals of technology payback. Some vendor proposals may not use NPV in their calculations, either because the salesperson doesn't know how to use it or, more likely, because the true payback period will be longer if calculated correctly using the NPV assumption.

Payback And ROI Example

Let's take the example of purchasing an automated dialer. The dialer costs $130,000 to purchase. We anticipate it will make outbound calling much more productive and actually save headcount value of approximately $35,000 the first year and $70,000 each year following

(after paying maintenance costs). With a simplified payback calculation, we divide the purchase price by the savings per month to determine the number of months the equipment will take to pay for the system. In this example, the payback period calculates to 28 months.

If we evaluate the return on the investment over three years (a common timeframe for evaluating technology investment returns), then the savings is $175,000 compared to the initial investment of $130,000, which calculates to a return of 135 percent. However, these calculations of payback period and ROI ignore the time value of money.

Now let's take a look at a more accurate method of calculating this payback based on a calculation of net present value

Net Present Value Calculation

The basic concept behind NPV is that a dollar in the future is generally worth less than a dollar today because people generally prefer present consumption to future consumption, inflation decreases the value of our currency over time, investment of today's dollar can increase its value, and any uncertainty or risk associated with future money reduces its value.

For example, if the assumed rate is 10

percent, then $1 today is worth $1.10 one year from now. However, $1 one year from now is worth $0.91 in today's dollars because the interest earned on the $0.91 over the course of a year at the investment's yield rate of 10 percent would be $0.09. Adding the interest earned during the year, $0.09, to the net present value, $0.91, equals $1 one year from now. A table showing the present value of a dollar over 10 years at rates of 4 percent to 10 percent is included in Table 1.

Table 2 shows the calculation of NPV on an investment of $130,000 for a new dialer. The company has forecast net savings in agent labor costs after maintenance costs are repaid. There is a savings (or positive net cash flow) each year, which increases as the use of the dialer is optimized after the first year. This example assumes a 10 percent rate.

The savings and return depend upon the length of the analysis period. If a three year analysis is done, the savings ($142,205) will pay for the $130,000 investment — with the investment to be covered after 33 months, compared to 28 months in our simpler vendor payback estimate. The ROI calculation would compare savings to the initial investment for an ROI of 109 percent. The total

Periods	4%	5%	6%	8%	10%
1	.96154	.95238	.94340	.92593	.90909
2	.92456	.90703	.89000	.85734	.82645
3	.88900	.86384	.83962	.79383	.75132
4	.85480	.82270	.79209	.73503	.68301
5	.82193	.78353	.74726	.68058	.62092
6	.79031	.74622	.70496	.63017	.56447
7	.75992	.71068	.66506	.58349	.51316
8	.73069	.67684	.62741	.54027	.46651
9	.70259	.64461	.59190	.50025	.42410
10	.67556	.61391	.55839	.46319	.38554

Table 1: Present Value Of $1.

NPV of the savings over four years looks better with a net return of $60,015. If the analysis is done for more than four years, it will look even better than the savings shown here.

Therefore, the sensitivity of the time-frame of the analysis is an important consideration.

Purchase Versus Lease

NPV is often used to compare two ways of paying for a solution such as a purchase or a lease. Because the outflows will vary between the two payment methods, though the savings are likely to be similar, the NPV is a good way to see the impact of paying less upfront and more each year for the lease alternative. The lease costs have been analyzed, in the analysis to the right, and we can see how this option compares to the outright purchase of the dialer.

This additional calculation allows us to compare the two financing options over a four-year period. While at three years the NPV of the lease is better ($43,275 for lease versus $12,205 for purchase), the NPV of

	Cash Flow	PVIF @ 10%	PV for Each Year	Cumulative NPV
Year 1	$ 35,000	0.909	$ 31,815	$31,815
Year 2	$ 70,000	0.826	$ 57,820	$89,635
Year 3	$ 70,000	0.751	$ 52,570	$142,205
Year 4	$ 70,000	0.683	$ 47,810	$190,015

Table 2: Calculation Of NPV.

	Cash Flow	PVIF @ 10%	PV for Each Year	Cumulative NPV
Year 1	$ 15,000	0.909	$ 13,635	$13,635
Year 2	$ 17,000	0.826	$ 14,620	$28,255
Year 3	$ 20,000	0.751	$ 15,020	$43,275
Year 4	$ 20,000	0.683	$ 13,660	$56,935

Table 3: Purchase Versus Lease.

the purchase becomes a better choice in the fourth and subsequent years ($56,935 for lease versus $60,015 for purchase).

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