

## DATA WAREHOUSE RETURN ON INVESTMENT – MYTHS AND MISTAKES

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Are you a CIO or IT professional tasked with performing a return on investment (ROI) analysis for a data warehouse? While you may not have asked for this finance-oriented task, this article will provide you with the rationale and guidelines to deliver a well-considered answer.

While predicting the benefits of a data warehouse may be more challenging than predicting the benefits of other IT systems, it is an exercise that must be done. Why? Because, in our experience, performing an ROI calculation forces a company to analyze the investment for its use and define its expected benefits.

Two myths surround data warehouse ROI calculation:

1. A warehouse ROI can't be calculated.
2. The warehouse itself produces returns.

*Myth 1: Data warehouse ROI can't be predicted.*

As pure reporting systems, warehouses are a relatively new concept. Early warehouse builders frequently worked from a philosophy of "build it and they will come." In other words, if they provided users with clean, integrated data from across the organization, users would find great ways to use it.

Great in theory but, too often, users didn't come. Most employees have jobs that are fairly well defined. They are responsible for producing a certain result and have tools for accomplishing that result. Give those employees a new tool for doing that same job, and you haven't improved the organization. You've just spent a lot of money to do the same things with a new tool.

What other investments can executives be enticed to make without understanding where the payback comes from? How many managers would purchase a new piece of equipment because, hopefully, the organization might someday find something to do with it?

It is true that it is quite possible that the company will find unexpected uses for its warehouse. But, in general, warehouse executive sponsors should be able to envision:

1. At least a few ways that the warehouse will improve upon the current processes and tools.
2. How those improvements will lead to greater profits.
3. The magnitude of those greater profits.

If these questions can't be answered, it is likely that the true value of the warehouse has not been identified. In this case, the investment should be delayed until these questions are answered.

### *Myth 2: Data warehouses produce returns.*

Many companies attempt to calculate the return on their warehouse investments. In fact, warehouse tool vendors frequently tout returns on warehousing investments in the hundreds of percent. But, in actuality, warehouses themselves provide no financial return.

On the other hand, investments in financial securities provide their own returns. For example, companies that invest in bonds know at the time of purchase how much those investments will return in interest payments.

Technology investments are vastly different. They have no inherent return. The return on technology investments is, instead, derived from the processes that the technologies enable. Thus, the source of warehousing ROI actually flows from the new or modified business processes that are possible only with the warehouse, not the warehouse itself.

### **The Source of ROI**

It is, therefore, inaccurate to talk about calculating the return on a warehouse investment. It is accurate to calculate the return on an investment in a new business process that is enabled by a data warehouse.

For example, an auto manufacturer reviews warranty claims on a quarterly basis. This analysis entails identifying faulty parts and changing manufacturing processes to avoid incurring future claims for these parts.

The company may build a warehouse to analyze its warranty expenditures. This, in itself, has no payback. But, assume that the manufacturer uses the warehouse to change the way in which it analyzes warranty claim data. Rather than reviewing claims quarterly, the warehouse enables a monthly review of claims. Thus, on a monthly basis, faulty parts are identified and that information is transmitted to the manufacturing plants. Maybe the process is changed in a way that allows the plants to do this analysis themselves.

The new process allows the company to identify problems much sooner. This, in turn, allows the fixes to be implemented months earlier, avoiding months' worth of warranty costs. Given this scenario, a manager could predict the value of the process enabled by the warehouse.

### **Predicting the Value of a Warehouse-Supported Process**

Many of the benefits of a warehouse stem from its ability to greatly reduce the amount of time needed to get information. Viewing the warehouse as a time-compression device, we can develop a framework for interviewing key executives to identify the sources of business value. The framework is documented in Figure 1.

Figure 1: Analyzing the business value of a data warehouse investment.

1. Identify and document the business goals of the executive (i.e., increasing sales by 20 percent).
2. Document the metrics by which attainment of those goals will be measured (i.e., dollar sales or unit sales. Note that these measures should be reportable by the warehouse).
3. Document the strategies that will be used to attain the goals (i.e., selling to wholesalers through a sales force supplemented by discounts and purchase incentives).
4. Document the "levers" that the manager can work with. A lever is a tool the manager has at his or her disposal. (i.e., modifying the commission structure, changing discount policies or notifying factories of changes in demand forecasts to ensure the availability of product).
5. Determine where time compression (via a warehouse-enabled process) will give management the ability to adjust levers sooner and, thereby, improve performance (i.e., two weeks into a month-long promotion we can determine the dollar sales and unit sales success of that promotion and determine whether or not to extend it. Given our knowledge about promotions, we believe this will allow us to increase dollar sales by approximately 5 percent over their current level.).

Note that there may be sources of return in addition to time compression. For example, perhaps the ability to view data in a color-coded map may provide new ways of allocating sales resources that can also improve performance.

### Calculating ROI

An ROI can be calculated for each year that money is allocated to an investment. The basic ROI formula is as follows:

Net cash flow from an investment

Value of the investment

For example, an investment of \$100,000 that provides a positive cash flow of \$150,000 in year one would have a return on investment of 150 percent that year ( $150,000/100,000$ ).

There are a number of variations on the ROI concept. Common ones include net present value and pay-back period calculations. Each of these is intended to measure the profitability – or expected profitability – of an investment. Companies have scarce resources for investment. In a perfect world, they would compare the expected ROIs of various projects and allocate those resources to the ones with the greatest expected ROIs.

*Calculating an expected return on investment requires two key figures:*

- The amount of the investment, and
- The expected cash flow of that investment.

### *Calculating the amount of the investment*

The amount invested includes amounts for originally implementing the process. This includes items such as:

- Hardware
- Software
- Developer salaries
- Consulting costs

This figure stays constant unless the company invests more in subsequent years. This figure represents the amount that the company could have dedicated to other projects but decided to dedicate to this one.

### *Calculating the expected benefits*

The benefits of a warehouse- enabled process fall into two broad categories: sources of increased revenue and sources of decreased costs.

Sources of increased revenue include:

- The estimated profit from purchases by new customers generated by the new process.
- The estimated profit resulting from the propensity of existing customers to purchase more due to the new process
- The profitability of sales not lost to competitors because of the new process

Sources of reduced costs include:

- Costs of current systems that will be eliminated
- Increases in efficiencies due to the new process

Expected benefits must be offset by the operating costs of the process:

- Software and hardware maintenance fees
- Salaries for those who maintain the system and train new system users.

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