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# Maximizing Value from Data Warehouse and Drill-Down Tools

Information is powerful. In the health care arena, the payoffs of harnessing information can be big – better evaluation of medical care, better tracking of services, better setting of rates and prices, better patient care, and better education of consumers. In order to realize these gains, many organizations have invested substantial sums in building data warehouses and drill-down reporting systems to extract the informational power of their internal and external data. Unfortunately, warehouse construction is only a first step to generating useful, insightful, actionable answers. Many organizations fail to take the necessary next steps and as a result do not realize the big payoff of their warehousing.

Typically, an organization's information technology (IT) department leads a warehousing project. The IT team determines business requirements, develops specifications, designs the database and update process, and finally creates the warehouse and deploys the reporting tools. An icon appears on the user's computer screen, training occurs on the mechanics of using the reporting tools, and then, after many months effort, the project is declared a success.

But wait! Where's the payback? At this point, there hasn't been any! How can the organization realize a significant return on investment for the warehousing and reporting tools project?

#### Payback comes from use

A primary payback of warehousing is a more efficient process for Information Systems to produce and deliver standard reports. Better yet, it should be much easier to develop new reports, and having the data centralized will increase the probability of reports footing to each other since they come from a common data source. These efficiency gains are real and substantial, and may in themselves justify the warehousing and reporting effort.

However, there is much more value to be had in the warehouse than this streamlining of standard reports; after all, there were standard reports produced before the data warehousing project. The bigger payoff comes from using data in an ad hoc fashion to support decisions and allowing the organization to identify and exploit market opportunities and competitive advantages. For example, an ad hoc analysis of member characteristics identified a subgroup of members who



were more likely to stay with a plan during open enrollment. This allowed the plan to make more effective use of its marketing dollars by fine-tuning outreach efforts.

Many organizations are not able to make this leap from the passive use of the system via standard reports to the active ad hoc use that can truly unlock the potential of data warehousing and drill-down reporting. But there are three steps that any organization can take to move itself toward realizing more value from its warehouse. These steps are:

- 1) Develop an analytic team
- 2) Get to know the data
- 3) Ask the hard questions of the results

## Develop an analytic team

There will be a core group of individuals who will be the primary users of the tools. These analysts, executives, programmers, operations managers, marketing specialists, etc. hold the key to unlocking the value of the data. To help maximize their contributions, consider:

- 1) **Forming a user group** Analysts benefit from working with other analysts. A user group fosters this collaboration, even if the individuals involved are from different departments. Another possibility is to create a staff dedicated to providing analysis and decision support, but that level of integration is not necessary to realize the benefits of analysts' collaboration.
- 2) Analyzing data before a decision is imminent Using data to support decisions should not slow up the decision making process, yet understanding the subtleties and interactions among data takes time and resources. The only way around this conundrum is to have analysts and decision makers working and understanding the data on an ongoing basis. One easy way to get this activity going is to customize the standard reports; after all, manipulating the data into the best format is why the reporting tools were purchased in the first place.
- 3) Working hard on framing analytic questions It is easy to get the right result to the wrong query, and this often confuses the decision making even more. An example is deciding which date field to use in an analysis of claims data. A question regarding processing efficiency most often needs to be based on the processed date of the claim, not when the health care service was incurred. A question based on the effect of a given benefit plan typically needs to be based on the incurred date of the claim, because benefit plans are usually framed around the dates services are performed. The wrong choice of date fields would provide confusing results.



## Get to know the data

Assembling the analytic team, aligning them with the business, and getting to work with the data is a good beginning, but is not enough to generate the big returns that come from fully using the data. It is also necessary to thoroughly understand the data. Three important steps are:

- 1) **Understand how the data is aggregated and categorized** standard aggregations can be misleading if their specifications are not understood. For example, looking at a categorization of inpatient care, it is important to understand what types of facilities, bed types and services are included. If nursing homes or rehab beds are included, average length of stay will be longer and cost per day will be lower than if they are not included. This could be critical in interpreting the results for decision-making.
- 2) **Compare definitions** Each business has a unique lexicon. Company colleagues know what a given term, e.g., allowed charges, means to the business. However, these terms are not necessarily the same across an industry, and these differences in definitions can cause erroneous conclusions. The example above about defining the inpatient care aggregation is a case in point.
- 3) Look at more than averages and totals Most cubes and reports present either a total or average for any given continuous variable. Although it is often convenient to have a one number answer, in our experience using one number generally obscures what is really going on with the data and the business. For example, the average health cost for an individual may be \$2,500 per year. While correct, using this statistic exclusively misses the point that 40% of individuals have no health cost in any given year and 5% of individuals account for 50% of the cost. Benefit planning and design decisions will want to consider this spread.

# Ask the hard questions of the results

The analytic team is formed, is on its way to understanding the data (note that it never will be completely understood!), and presents results. Now is the time for the hard work, the type that separates the pros from the amateurs: detecting and correcting errors in both the findings and conclusions of the analyses. The following questions, and a critical eye, will go a long way toward discovering mistakes, and thereby avoiding making decisions based on incorrect analyses.

 "How do I know this is right?" Studies have found that 80% of spreadsheets have errors in them that affect the bottom line. The staff completing these spreadsheets consistently reported that they were confident or very confident that the spreadsheets were accurate. Reviewing and questioning results is the chief problem for the consumer of information.



One method to tackle this question is to find comparative data. Possibilities include other production reports, last year's results, and external data.

- 2) "Is the difference meaningful?" If numbers change from measurement to measurement, a bit of statistics elegantly applied with business sense will ground subsequent decision making. For example, if this year's result is 42.00 and last year's result was 41.69, it would be good to know if this is a real difference or within the bounds of chance. Moreover, do the differences, if real, have any real business significance?
- 3) **"Do these results apply to the future?"** A common error is to assume the future will be like the past. Just because last period's average was 36 does not mean this year's average should be 36. Similarly, just because the last year-over-year trend was 11% does not mean that next year's trend will be 11%. Simple assumptions of future performance are almost always used in pro forma reports, and they are almost always wrong the key is to understand the source of uncertainty and to discount the conclusions appropriately.
- 4) "Is the relationship causal?" Data cubes make it easy to drill down and discover that different groups have different outcomes on a given variable. A common mistake is to assume that the different outcomes are caused by the different groupings. For example, a warehouse and associated cube may show that the Sacramento office processes claims faster (as measured by turnaround time) than the Houston office. A naïve manager might conclude that shifting claims from Houston to Sacramento would improve overall turnaround time, i.e., that the office is somehow causing the turnaround statistic. In this case, further analysis might reveal that the Sacramento office has a much larger proportion of electronic claims that are processed much faster. Shifting claims to Sacramento will not change the proportion that is electronic, so turnaround time does not improve overall.

## Are we there yet?

Information is valuable. Developing a data warehouse and deploying reporting tools are good steps on the path to unlocking the value stored in the data. But these are only the initial steps. By following the outline above, organizations can move further along the path to fully realizing the potential of the data.

An organization has become data-actualized when data is brought into most decisions, and bringing it into the decision is not the result of a Herculean effort. By developing an analytic team, knowing the data, and asking the hard questions about the results, the company will begin to have a deep understanding of the quantitative areas of the business. This deep understanding will enable even instant, "gut-level" decisions to be based on data and analyses that have already been assimilated into organizational wisdom.

