

HOW TO JUSTIFY BUSINESS INTELLIGENCE



*by Bill Robinson
Senior Advisor, QuantiSense
Professor of Marketing, Towson University*

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INTRODUCTION

With a common repository of information, called a data warehouse, your organization can run at maximum efficiency, better understand the needs of your customers, and empower your people to creatively grow your business. To accomplish these goals you need a way to unlock the information potential of your existing operational systems so your people gain insight and ultimately take the actions to improve business results.

This document first goes through the benefits of creating a data warehouse separate from your operational systems and then discusses the benefits of business intelligence enabled from a data warehouse infrastructure.

OPERATIONAL SYSTEMS VS. DATA WAREHOUSES

You already have operational systems with the data you desire. Why do you need a data warehouse? Here are the three major reasons.

ALL IN ONE PLACE

As your organization embraces more information-based initiatives, the tendency is for information to become decentralized. Retailers of your size typically purchase multiple best-of-breed solutions to fulfill the special needs of your business. You have accumulated years of archived data that would be valuable for historical analysis. The first important feature of a data warehouse is that it provides a comprehensive, historical, and homogenized view of the organization. The view is comprehensive, because it includes the necessary information across your organization. The view is historical, because all relevant information from prior years is available. The view is homogenized, because data from multiple sources is handled consistently, for instance a common definition of your products or key performance indicators like gross margin. Once you build your data warehouse, you will have strengthened your informational infrastructure making it easier to add new elements, ingrate new best-of-breed systems, and attract top quality people. Lastly, a data warehouse can evolve over time to accommodate an ever-changing environment of business needs and new operational applications.

DESIGNED FOR ANALYSIS

The function of an operational system is to support the day-to-day operations of your business. In contrast, the function of a data warehouse is to support information access and to transform information into insight and action. This fundamental difference in function permeates the design of each class of system. That is why operational systems do not do well when they try to support business intelligence functionality. Companies

struggle when their information infrastructure is built upon a patchwork of disparate operational systems because they are impairing their ability to gain insight from business intelligence functionality. The table below summarizes the differences between the systems¹.

Operational Systems	Data Warehousing Systems
Operational systems are designed to support high-volume <i>transaction processing</i> with minimal back-end reporting.	Data warehousing systems are designed to support high-volume <i>analytical processing</i> and <i>report generation</i> .
Operational systems are generally <i>process-oriented</i> or <i>process-driven</i> , meaning that they are focused on specific business processes or tasks. Example tasks include POS, Ordering, and Receiving.	Data warehousing systems are generally <i>subject-oriented</i> , organized around business areas that your users need information about. Such subject areas are usually populated with data from one or more operational systems.
Operational systems are generally concerned with <i>current data</i> .	Data warehousing systems are generally concerned with <i>historical data</i> .
Data within operational systems are generally <i>real-time and updated</i> according to need.	Data within a data warehouse is generally <i>non-volatile</i> , meaning that new data may be added regularly, but once loaded, the data is <i>rarely changed</i> , thus preserving an ever-growing <i>history of information</i> . A data warehouse is generally <i>read-only</i> .
Operational systems are generally optimized to perform <i>fast inserts and updates</i> of relatively <i>small volumes of data</i> .	Data warehousing systems are generally optimized to perform <i>fast retrievals</i> of relatively <i>large volumes of data</i> .
Operational systems are generally <i>application-specific</i> , resulting in a multitude of partially or non-integrated systems and <i>redundant data</i> .	Data warehousing systems are generally <i>integrated</i> at a layer above the application layer, avoiding data redundancy problems.
Operational systems generally require a <i>non-trivial level of computing skills</i> amongst the end-user community.	Data warehousing systems generally appeal to an end-user community with a <i>wide range of computing skills</i> , from Executives to Analysts.

¹ Rensselaer Data Warehouse Project content contributed to this table

SANCTITY OF OPERATIONAL SYSTEMS

Your operational systems are critical to your ability to conduct business with customers, suppliers, and other operations. Business intelligence functionality requires significant computer processing to access large volumes of information. Running business intelligence queries on operational systems interferes with the performance of those systems. Operational systems are simply not designed to efficiently handle business intelligence activity.

THE BENEFITS OF BUSINESS INTELLIGENCE

Software is the infrastructure that enables users to produce benefits and competitive advantage. Unto itself, software produces no benefits at all. That's what users do.

Business intelligence software organizes and presents information so that people can gain insight. Insight leads to action. A data warehouse monitors results after the action. That leads to more insight and eventually, knowledge. Business intelligence software leads you to the benefits in the following seven categories:

- ⦿ **Increasing knowledge**
- ⦿ **Improving business relationships**
- ⦿ **Improving return on inventory assets**
- ⦿ **Improving return on non-inventory assets**
- ⦿ **Reducing expenses**
- ⦿ **Improving productivity**
- ⦿ **Increasing sales**

Business intelligence starts with information. If you don't have good information, you don't want business intelligence software. If you do have it, you do.

INCREASING KNOWLEDGE

The most valuable companies value knowledge. The most valuable companies empower their users to gain insight from information and to take action. They recognize that their success depends on the intensity with which they pursue insight. Since data warehousing transforms information into insight, it promotes competitive advantage.

Still, it is up to the user to deliver benefits. The implementation of a data warehouse must remove all impediments including issues relating to data integrity, user empowerment, access, and performance.

You want your best people to be continuously learning about your customers, operations, merchandise, and competitive market. You can test their knowledge. Do they know the top ten stores in each category? Which stores do their best business on Saturdays? Do they know the most troublesome price points in various categories? Can they tell how sparse inventories can be before sales dry up?

You justify business intelligence software when you can trust your data warehouse to deliver more insight to more knowledgeable professionals than your competitors' data warehouse does. As you establish a lead on your competition in this area, your lead is usually sustainable.

A business intelligence system gives your management and your professionals the tools they need to excel and to polish their craft. Lack of proper IT tools is one of the reasons most often given by retail professionals and managers for leaving their jobs to go with a competitor.

Knowledgeable companies are valued higher than their less knowledgeable competitors. You can measure the benefit of knowledge with shareholder value because knowledge creates wealth. Ask any Wall Street analyst; they know that you can't improve what you can't measure.

IMPROVING BUSINESS RELATIONSHIPS

Your success is derived from your relationships with your customers, stores, employees, and suppliers. Have you established a standard for a "good" relationship with each? Conversely, a "bad" relationship? Usually, these standards are measured in performance terms. You want to remedy bad customers, employees, stores, and suppliers. You want to increase the number of good performers. These actions can only be taken when you measure performance consistently with common metrics across your organization. Once everyone knows how they are being measured, that's usually incentive enough to stimulate improvement.

Count the number of good relationships you have with high performing customers, then stores, then employees, then suppliers. As you take action, thanks to your data warehouse, to increase the count, you are increasing the value of your company. Wall Street wants to know the number of good relationships you have with customers and suppliers because these relationships represent the core of your business. Those relationships also represent sustainable competitive advantage, value to your customers, and contribute directly to shareholder value.

IMPROVING INVENTORY RETURNS

Business intelligence users are able to improve gross margin and turn on inventory investment simply because they have better tools to measure them. For example, if you analyze two similar stores in mid-season for overstock conditions, a professional merchant can usually lower inventory levels and reduce markdowns simply by

balancing stock between the two stores. Extend the same principle across hundreds of stores and you magnify the inventory return.

You measure the benefit of improving inventory by gross margin and inventory turn.

IMPROVING RETURN ON NON-INVENTORY INVESTMENTS

Your capital expenditure for IT investments (hardware, software, POS, and networks) was justified based on the promise of the benefits discussed in this paper. Unfortunately, most IT investments have not fulfilled their promise because of the obstacles that interfere with users' ability to gain insight from information. Usually the obstacles relate to information availability, data inconsistencies, data integrity, inconsistent metrics, and information presentation techniques.

Data warehouses add value to all previous IT investments because information can at last be exploited. An excellent data warehouse implementation lessens the pressure to replace other infrastructural investments because people are getting what they need to do their jobs.

You measure the benefit of return on non-inventory investment by extending the productive life of previous investments and by cost avoidance.

REDUCING EXPENSES

The power of business intelligence software has a significant impact on company expenditures. You can eliminate many steps typically required to assemble and reconcile information from disparate sources. Eliminated steps include:

- **Steps to extract data into data marts and spreadsheets**
- **Software licenses and maintenance costs for obsolete software such Access, FoxPro, etc.**
- **Cost of printing detailed reports that are no longer needed**
- **Cost of filing, collating, copying, disposing of printed reports**
- **Cost of outsourcing**

You measure the expense reduction benefit by costing out each eliminated step.

INCREASING PRODUCTIVITY

Your data warehouse will streamline the effort to acquire and digest information. This benefit is realized when users learn that they can save time by looking at summarized, graphically displayed information instead of plowing through the details to find the exceptions that need attention. For example, skilled merchants searching for stock out conditions don't have to sift through Store|SKU|Day level inventory and sales information when the business intelligence system can simply return an exception report of the incidents where stock outs need to be fixed.

You measure productivity increases by measuring the amount of work that can be accomplished within a time interval.

INCREASED SALES

Your management will discover that business intelligence software will reveal the reason why conditions result in positive sales increases. These conditions include:

- ⦿ **Promotion**
- ⦿ **Markdown**
- ⦿ **Merchandising initiatives**
- ⦿ **Inventory mix**
- ⦿ **Sales training**
- ⦿ **Weather**
- ⦿ **External events**

In each case, it is easy to isolate the condition that caused the sales increase by sampling the information and setting up control groups. For example, if you decide to promote your stores in a certain way, test the concept first with controlled group of stores and measure the sales uplift compared to stores that are not involved. Similarly, your users will gain a better understanding of initiatives that are not successful in increasing sales.

You measure the benefit of increasing sales by multiplying the sales uplift times the gross margin offset by any cost of the initiative.

CONCLUSION

In the final analysis, justifying a business intelligence system built on a data warehouse is about empowering your best people to gain insight from exploiting the information you've spent millions to control and years to develop. The data warehouse with business intelligence has the potential to enable users to continuously produce enormous, sustainable, measurable benefits that lead to competitive advantage and fulfill the promise of IT.