



# The Financial Impact of Business Analytics

## Case Studies



*This case is an excerpt from the IDC study: "The Financial Impact of Business Analytics".*

*Highmark Inc. used Teradata software/technology to deploy an analytic application and achieved a positive ROI.*

# The Financial Impact of Business Analytics

An IDC ROI Study

## Analysts

Henry Morris, Ph.D., Stephen Graham, Per Andersen, Karen Moser, Robert Blumstein, Dan Vesset, Nathaniel Martinez, and Marilyn Carr

## Introduction

*Evidence of a narrow IT payback suggests that a large portion of America's white-collar economy has been left out of the so-called revolution of the New Economy.*

— Stephen Roach, Economist, Morgan Stanley

Businesses are undergoing a fundamental shift in the way they make decisions. In today's environment, decision making occurs more frequently and at all levels of an organization. It is no longer a semiregular senior management activity.

Many organizations invested in their core data infrastructures to facilitate accurate information dispersal, but the trend toward democratization of information and broadening decision-making responsibilities demands more. In particular, it requires timely delivery of relevant information to each decision maker. Business analytics solutions are the next step in using technology to support the decision-making process. These solutions provide trend analysis and performance feedback and facilitate decisive actions that result in measurable gains in cost efficiency or revenue growth.

## The Study

IDC's *The Financial Impact of Business Analytics* study examines the financial impact of analytic applications on the core business processes that contribute to an organization's success. It also examines the experience and impact of business analytics projects undertaken by 43 organizations.

A key strength of IDC's approach is that it examines true bottom-line results and not theoretical costs or savings. The results accurately reflect the reality faced by decision makers who must create a pro-forma evaluation of business impact when a new technology solution is implemented in their organization.

The study comprises three reports: *White Paper* provides an overall review of the study findings; *Final Report* provides a detailed analysis and discussion of the study results; and *Case Studies* provides a compendium of detailed case studies drawn from the extensive research conducted by IDC.

## Sample Selection and Methodology

IDC made efforts to select companies based upon a balanced sample of geographic location, industry, and company size and to represent various types of applications within the sample.

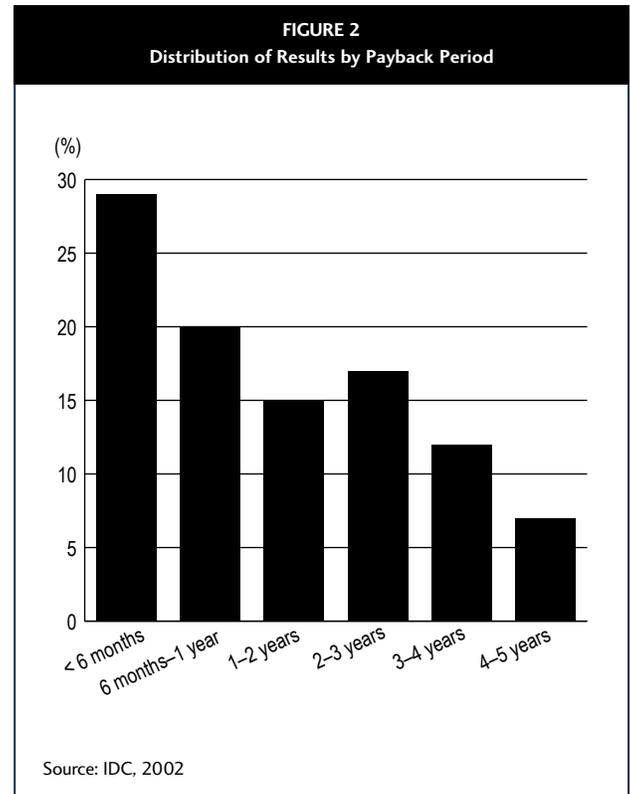
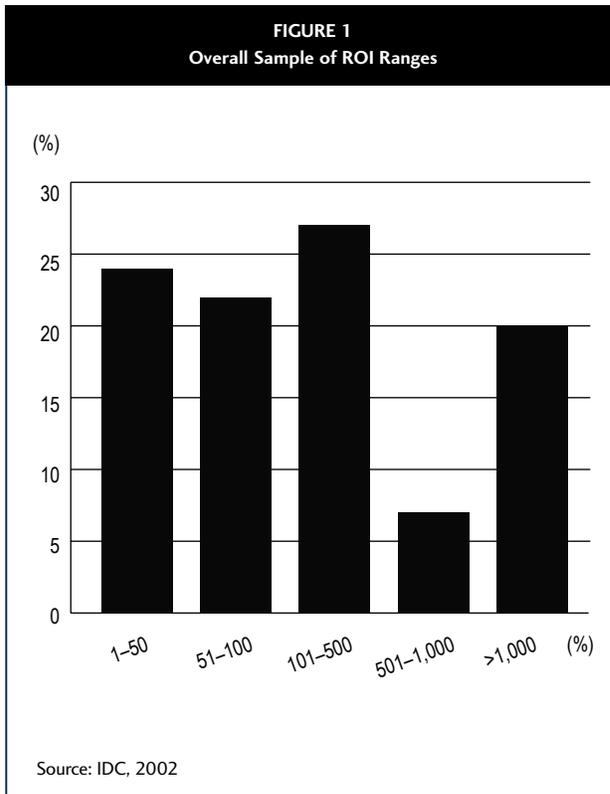
Copyright © 2002, IDC. All rights reserved. No part of this report may be reproduced, stored, or distributed via an electronic retrieval system or transmitted in any form or by any means without express written permission from IDC.

External Publication of IDC Information and Data — Any IDC information that is to be used in advertising, press releases, or promotional materials requires prior written approval from the appropriate IDC Vice President or Country Manager. A draft of the proposed document should accompany any such request. IDC reserves the right to deny approval of external usage for any reason.

## The Financial Impact of Business Analytics: Key Findings

The study found that a business analytics implementation generates a median five-year return on investment (ROI) of 112% with a mean payback of 1.6 years on average costs of \$4.5 million. Of the organizations included in this study, 54% have an ROI of 101% or more.

The range of ROI results from these business analytics projects is impressive (see Figure 1). Returns range from 17% to more than 2,000%. While 46% of the organizations generated an ROI of 100% or less, 34% generated an ROI between 101% and 1,000%, and 20% reported ROI of 1,000% or more.



The study shows that although a business analytics implementation is a substantial investment for an organization, it can also deliver substantial benefits. For the study participants, value accrued through quantitative and qualitative benefits that range from increased business performance to reduced operations costs and improved customer relations. Organizations interviewed for this study consider their particular business analytics implementation either a necessary cost of business or a critical factor in their plan for success and survival in a highly competitive market.

The following case is about one of the 43 organizations interviewed for the study.

# Case Study: Highmark Inc.

*With nearly 23 million members to serve, Highmark Inc., a healthcare insurer and financial services provider, has its hands full tracking its customers and services. Lack of visibility into the interactions between its customers and their physicians prevented the health-care company from identifying and stemming the drain of funds (primarily caused by fraudulent claims, as well as redundant fees and other clerical glitches) from the company's bottom line. The insurer implemented an analytic application on top of its data warehouse. The result was more accurate information to make decisions, reduced losses from fraud, and a better understanding of its customers.*

## Background

Highmark Inc. provides health and financial products and services to approximately 6 million Pennsylvanians operating as Highmark Blue Cross Blue Shield in 29 counties of western Pennsylvania and as Pennsylvania Blue Shield in the remainder of the state. The company faces several key challenges in providing medical, dental, vision benefits, and life and casualty insurance coverage to its constituents, particularly the rising cost of providing healthcare services and an increasing customer demand for such services.

Clinical technology costs, required IT investments, a nursing shortage, and increasing government and regulatory mandates dictate and restrict Highmark's business decisions. Local competition has sprung up, in addition

<b>Vital Stats</b>	<b>Company</b>	Highmark Inc.
	<b>City, State/Province</b>	Pittsburgh, PA
	<b>Industry</b>	Healthcare
	<b>Revenues</b>	\$9 billion
	<b>Employees</b>	11,000
	<b>Number of Analytic Application Users</b>	100 decision support analysts and 400+ operational users
	<b>Approach</b>	Combined Build and Buy
	<b>Primary Objective</b>	Visibility into customers and claims
	<b>Primary Users</b>	Advanced decision support analysts, reporting analysts, customer service/operations representatives
	<b>ROI</b>	353%

to competition from national "non-Blue" insurers who now focus on serving Highmark's traditional customer — large national employers. The company is also well aware of a shift from employer-sponsored plans to delegated or defined contribution plans, under which customers have more choice of where and how they can spend their healthcare dollars.

In response to the market dynamics, Highmark plans to expand to other regions and become a consumer-focused company. At the same time, the company wants to maintain its 65% market share and the financial stability of the company. Therefore, cost management and accurate trend analysis are key components of its five-year plan.

## Business Challenge

Although Highmark already had a data warehouse, it wasn't fully utilized. There was no predictive modeling or analysis of future results based on

existing trends. With an increased focus on improved decision making and accountability, closer interaction with the consumer, and improved cost management, Highmark needed a more advanced and proactive data analysis and information mining environment than its current infrastructure allowed. Hence the genesis of the Healthcare Informatics group, which was tasked with moving the company from an introspective style of reporting on what had already happened to a forward-looking, predictive model of what will happen, could happen, or could be made to happen.

## Before the Business Analytics Implementation

Business analysts were only able to execute one to two reports a day using the older infrastructure. This slow pace was exacerbated by the fact that the information they were gathering was inconsistent and that they lacked innovative and sophisticated techniques and data interpreta-

tion skills to do more than report on what had already happened. There was no analysis of what was expected to happen in the future or analysis of why things happened.

There was no clear, in-depth analysis of the company's customers and their interaction with the healthcare network of physicians. Thus, it was impossible for Highmark to reach two of its primary goals: a closer relationship with the consumer and cost management.

### **After the Business Analytics Implementation**

First of all, Darren Macioce, vice president of Healthcare Informatics, faced the task of replacing the existing data warehouse infrastructure with one that was faster and better able to support business analytics. He gathered a group of technical and data analysts along with business experts to create a skill and knowledge base that would help the company interpret the analytics forthcoming from the new environment.

A revamped infrastructure resulted in a 200-300% increase in performance, allowing business analysts to generate detailed reports daily and much more quickly than before. There was also a corresponding decrease in mainframe utilization and associated costs. The new analytics allowed the Healthcare Informatics group to identify more than \$8 million in potential fraud activities in less than four months by looking for trends and anomalies in the data.

Furthermore, the company was able to reduce its operations staff because of a significant increase in productivity. The Healthcare Informatics group is a centralized resource for trend and statistical analysis, and the faster system allowed it to do more with less. Therefore, staff was not required to pour through mounds of data — to find that elusive needle in a haystack. Because of its new ability to track claims and customers, as well as their interaction with the physician or healthcare provider, Highmark was able to identify significant opportunities to reduce variation in physician practice patterns and associated costs while improving the quality of care. "This would not have occurred without the new capability," says Macioce.

Highmark's data warehouse is also the foundation for highly targeted medical management outreach programs, physician performance profiling and ranking based on quality of care, additional fraud detection in other areas of the company, strategic planning and market analysis, and product performance measurement and planning.

"We understand our customer much better than we ever have before," says Cindy Delleker, vice president of product management and development for Highmark.

### **Implementation Approach**

The existing data warehouse was moved off onto a new client-server infrastructure with the creation of the Healthcare Informatics group. The Informatics group retains a close relationship with IT, which maintains the data warehouse and associated applications.

Five technical experts and five business experts were in charge of getting the new data warehouse and analytic application up and running. In 2002, remaining software from the previous implementation was phased out. Existing home-grown data feeds and translations from the various internal systems were simply transferred over to the new data warehouse.

Copyright © 2002 IDC. Reproduction without written permission is completely forbidden.

External Publication of IDC Information and Data — Any IDC information that is to be used in advertising, press releases, or promotional materials requires prior written approval from the appropriate IDC Vice President or Country Manager. A draft of the proposed document should accompany any such request. IDC reserves the right to deny approval of external usage for any reason.

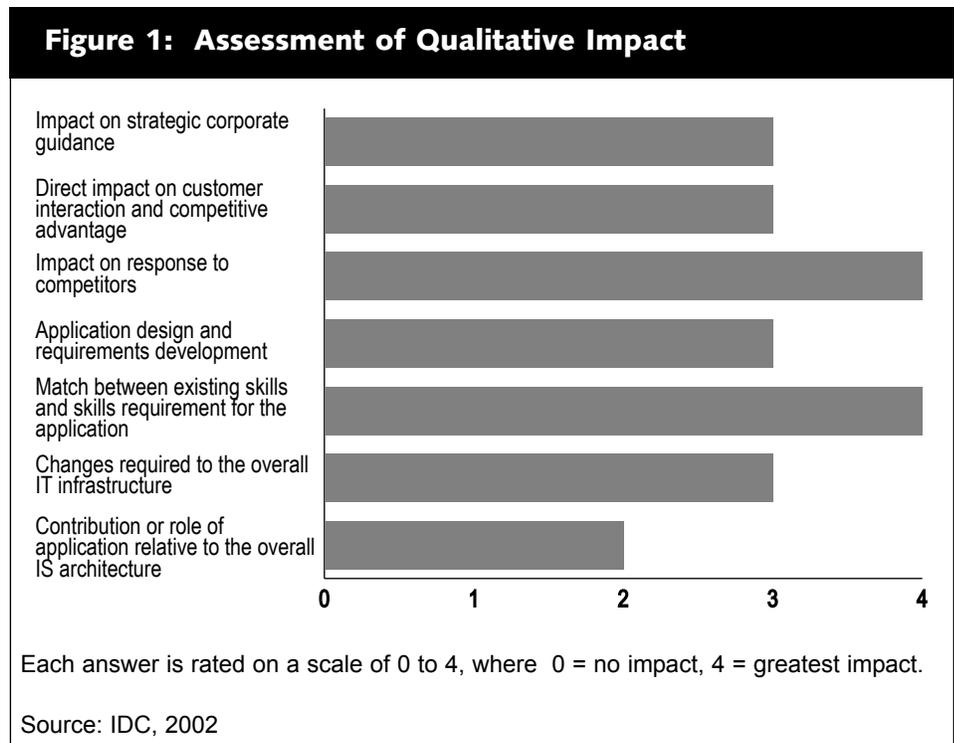
Case Study:  
Highmark Inc.

**Implementation Timeline**

<b>June 1994</b>	Started production of initial data warehouse
<b>February 1995</b>	Completed development of initial data warehouse
<b>February 1998</b>	Established Healthcare Informatics group
<b>August 1999–2000</b>	Determined need for business analytics and predictive modeling, evaluated infrastructure and software suppliers
<b>October 2000</b>	Created benchmark and migrated to new infrastructure
<b>March 2001</b>	Began to leverage analytic applications
<b>May 2001</b>	Began delivery of weekly data snapshots

**Lessons Learned**

- Gather analysis skills into a core group that can feed and improve each group member's skills. Alternate between analysts sitting within the group for knowledge transfer and being out in the various business units helping to solve specific problems. Analysts need an understanding of the day-to-day needs of business users.
- Combine technical and analytical skills with business knowledge and expertise to get the most out of business analytics.
- Build it incrementally, get something up and running, and improve it from there. You can't define everything in advance.
- Business analytics is a constantly evolving process. It can always be refined and improved.
- Keep in mind that what you think the business needs and what the business thinks it needs may be two entirely different things. The only way to figure out what's really needed is to get people to use it. You can have the best data warehouse in the world and not capitalize on it.



## Business Analytics Financial Worksheet: Highmark Inc.

Annual Increased Revenues + Savings	Base	Year 1	Year 2	Year 3	Year 4	Year 5
Technology-related benefits						
Cost avoidance		\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000
Cost reduction		\$6,000,000	\$6,000,000	\$6,000,000	\$6,000,000	\$6,000,000
Productivity-related benefits						
Productivity enhancement		\$1,951,950	\$1,951,950	\$1,951,950	\$1,951,950	\$1,951,950
Staff re-deployment						
Workforce reduction		\$508,200	\$508,200	\$508,200	\$508,200	\$508,200
Business process enhancements						
Management framework						
Core competencies						
Enabling functions		\$8,000,000	\$8,000,000	\$8,000,000	\$8,000,000	\$8,000,000
<b>Total</b>	<b>\$0</b>	<b>\$17,460,150</b>	<b>\$17,460,150</b>	<b>\$17,460,150</b>	<b>\$17,460,150</b>	<b>\$17,460,150</b>
Capital Expenditures	Initial	Year 1	Year 2	Year 3	Year 4	Year 5
Additional in-house hardware (see note one below)	\$966,000					
Additional in-house software (see note two below)	\$983,500					
<b>Total</b>	<b>\$1,949,500</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Depreciation Schedule	Initial	Year 1	Year 2	Year 3	Year 4	Year 5
Additional in-house hardware		\$322,000	\$322,000	\$322,000	\$0	\$0
Additional in-house software		\$327,833	\$327,833	\$327,833	\$0	\$0
<b>Total</b>		<b>\$649,833</b>	<b>\$649,833</b>	<b>\$649,833</b>	<b>\$0</b>	<b>\$0</b>
Expensed Costs	Initial	Year 1	Year 2	Year 3	Year 4**	Year 5**
Services (internal)	\$708,850	\$193,050	\$193,050	\$193,050	\$193,050	\$193,050
Services (external)	\$966,000					
Software licenses/maintenance		\$92,500	\$135,000	\$135,000	\$135,000	\$135,000
Server purchase/maintenance		\$96,600	\$96,600	\$96,600	\$96,600	\$96,600
Storage purchase/maintenance						
Training (technology and end user)	\$30,000					
<b>Total</b>	<b>\$1,704,850</b>	<b>\$382,150</b>	<b>\$424,650</b>	<b>\$424,650</b>	<b>\$424,650</b>	<b>\$424,650</b>
Basic Financial Assumptions						
All Federal and State Taxes	40%					
Discount Rate	15%					
Depreciation — Straight Line (years)	3					
Net Cash Flows	Initial	Year 1	Year 2	Year 3	Year 4	Year 5
Total Benefits	\$0	\$17,460,150	\$17,460,150	\$17,460,150	\$17,460,150	\$17,460,150
Less: Total Costs	\$1,704,850	\$382,150	\$424,650	\$424,650	\$424,650	\$424,650
Less: Depreciation		\$649,833	\$649,833	\$649,833	\$0	\$0
Net Profit Before Tax	(\$1,704,850)	\$16,428,167	\$16,385,667	\$16,385,667	\$17,035,500	\$17,035,500
Net Profit After Tax	(\$1,022,910)	\$9,856,900	\$9,831,400	\$9,831,400	\$10,221,300	\$10,221,300
Add: Depreciation		\$649,833	\$649,833	\$649,833	\$0	\$0
Less: Capital Expenditures	\$1,949,500	\$0	\$0	\$0	\$0	\$0
<b>Net Cash Flow After Taxes</b>	<b>(\$2,972,410)</b>	<b>\$10,506,733</b>	<b>\$10,481,233</b>	<b>\$10,481,233</b>	<b>\$10,221,300</b>	<b>\$10,221,300</b>
Financial Analysis	Results					
5-Year ROI	353%					
Payback (Years)	0.33					
5-Year NPV using 15% discount rate	\$27,744,898					

### Notes

- 1.) When hardware costs are in excess of \$50,000 they are depreciated over three years.
- 2.) When software costs are in excess of \$50,000 they are depreciated over three years.
- 3.) Hardware and software costs less than \$50,000 are expensed as incurred.
- 4.) Software upgrades are treated as a depreciable asset if greater than \$50,000, otherwise they are expensed as incurred.
- 5.) Assume a 220-day working year, 35 hour productive working week.
- 6.) The figures used in this spreadsheet are an independent financial assessment derived by IDC analysts. The subject company supports the formulas and analysis as a fair and reasonable representation of the benefits of its business analytics implementation. The data was compiled by IDC from multiple sources.



5 Speen Street, Framingham, MA 01701, USA

(508) 872-8200 Fax (508) 935-4015

[www.idc.com](http://www.idc.com)