

Your plain-English guide to  
making better business decisions!

# Business Intelligence

FOR

# DUMMIES®

A Reference  
for the  
**Rest of Us!**®

FREE eTips at [dummies.com](http://dummies.com)®

Swain Scheps

*Harness BI tools  
for forecasting and  
decision-making*



# *Business* *Intelligence*

FOR

# DUMMIES®

by Swain Scheps



Wiley Publishing, Inc.

## **Business Intelligence For Dummies®**

Published by

**Wiley Publishing, Inc.**

111 River Street

Hoboken, NJ 07030-5774

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

Copyright © 2008 by Wiley Publishing, Inc., Indianapolis, Indiana

Published by Wiley Publishing, Inc., Indianapolis, Indiana

Published simultaneously in Canada

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, scanning or otherwise, except as permitted under Sections 107 or 108 of the 1976 United States Copyright Act, without either the prior written permission of the Publisher, or authorization through payment of the appropriate per-copy fee to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, (978) 750-8400, fax (978) 646-8600. Requests to the Publisher for permission should be addressed to the Legal Department, Wiley Publishing, Inc., 10475 Crosspoint Blvd., Indianapolis, IN 46256, (317) 572-3447, fax (317) 572-4355, or online at <http://www.wiley.com/go/permissions>.

**Trademarks:** Wiley, the Wiley Publishing logo, For Dummies, the Dummies Man logo, A Reference for the Rest of Us!, The Dummies Way, Dummies Daily, The Fun and Easy Way, Dummies.com, and related trade dress are trademarks or registered trademarks of John Wiley & Sons, Inc. and/or its affiliates in the United States and other countries, and may not be used without written permission. All other trademarks are the property of their respective owners. Wiley Publishing, Inc., is not associated with any product or vendor mentioned in this book.

**LIMIT OF LIABILITY/DISCLAIMER OF WARRANTY:** THE PUBLISHER AND THE AUTHOR MAKE NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THE ACCURACY OR COMPLETENESS OF THE CONTENTS OF THIS WORK AND SPECIFICALLY DISCLAIM ALL WARRANTIES, INCLUDING WITHOUT LIMITATION WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE. NO WARRANTY MAY BE CREATED OR EXTENDED BY SALES OR PROMOTIONAL MATERIALS. THE ADVICE AND STRATEGIES CONTAINED HEREIN MAY NOT BE SUITABLE FOR EVERY SITUATION. THIS WORK IS SOLD WITH THE UNDERSTANDING THAT THE PUBLISHER IS NOT ENGAGED IN RENDERING LEGAL, ACCOUNTING, OR OTHER PROFESSIONAL SERVICES. IF PROFESSIONAL ASSISTANCE IS REQUIRED, THE SERVICES OF A COMPETENT PROFESSIONAL PERSON SHOULD BE SOUGHT. NEITHER THE PUBLISHER NOR THE AUTHOR SHALL BE LIABLE FOR DAMAGES ARISING HEREFROM. THE FACT THAT AN ORGANIZATION OR WEBSITE IS REFERRED TO IN THIS WORK AS A CITATION AND/OR A POTENTIAL SOURCE OF FURTHER INFORMATION DOES NOT MEAN THAT THE AUTHOR OR THE PUBLISHER ENDORSES THE INFORMATION THE ORGANIZATION OR WEBSITE MAY PROVIDE OR RECOMMENDATIONS IT MAY MAKE. FURTHER, READERS SHOULD BE AWARE THAT INTERNET WEBSITES LISTED IN THIS WORK MAY HAVE CHANGED OR DISAPPEARED BETWEEN WHEN THIS WORK WAS WRITTEN AND WHEN IT IS READ.

For general information on our other products and services, please contact our Customer Care Department within the U.S. at 800-762-2974, outside the U.S. at 317-572-3993, or fax 317-572-4002.

For technical support, please visit [www.wiley.com/techsupport](http://www.wiley.com/techsupport).

Wiley also publishes its books in a variety of electronic formats. Some content that appears in print may not be available in electronic books.

Library of Congress Control Number: 2007938873

ISBN: 978-0-470-12723-0

Manufactured in the United States of America

10 9 8 7 6 5 4 3 2 1



# Contents at a Glance

---

<b><i>Introduction .....</i></b>	<b>1</b>
<b><i>Part I: Introduction and Basics .....</i></b>	<b>7</b>
Chapter 1: Understanding Business Intelligence.....	9
Chapter 2: Fitting BI with Other Technology Disciplines .....	23
Chapter 3: Meeting the BI Challenge.....	37
<b><i>Part II: Business Intelligence User Models.....</i></b>	<b>49</b>
Chapter 4: Basic Reporting and Querying.....	51
Chapter 5: OLAP: Online Analytical Processing .....	67
Chapter 6: Dashboards and Briefing Books .....	89
Chapter 7: Advanced / Emerging BI Technologies .....	101
<b><i>Part III: The BI Lifecycle.....</i></b>	<b>115</b>
Chapter 8: The BI Big Picture.....	117
Chapter 9: Human Factors in BI Implementations .....	131
Chapter 10: Taking a Closer Look at BI Strategy .....	143
Chapter 11: Building a Solid BI Architecture and Roadmap .....	163
<b><i>Part IV: Implementing BI .....</i></b>	<b>183</b>
Chapter 12: Building the BI Project Plan .....	185
Chapter 13: Collecting User Requirements .....	205
Chapter 14: BI Design and Development .....	223
Chapter 15: The Day After: Maintenance and Enhancement.....	243
<b><i>Part V: BI and Technology.....</i></b>	<b>259</b>
Chapter 16: BI Target Databases: Data Warehouses, Marts, and Stores .....	261
Chapter 17: BI Products and Vendors.....	283
<b><i>Part VI: The Part of Tens .....</i></b>	<b>301</b>
Chapter 18: Ten Keys to BI Success .....	303
Chapter 19: Ten BI Risks (and How to Overcome Them).....	309
Chapter 20: Ten Keys to Gathering Good BI Requirements .....	315
Chapter 21: Ten Secrets to a Successful BI Deployment .....	323
Chapter 22: Ten Secrets to a Healthy BI Environment.....	331
Chapter 23: Ten Signs That Your BI Environment Is at Risk .....	339
<b><i>Index .....</i></b>	<b>345</b>



# Table of Contents

---

## *Introduction.....* 1

About This Book.....	2
How to Use This Book .....	2
How This Book Is Organized.....	3
Part I: Introduction and Basics .....	3
Part II: Business Intelligence User Models .....	3
Part III: The BI Lifecycle.....	4
Part IV: Implementing BI.....	4
Part V: BI and Technology.....	4
Part VI: The Part of Tens .....	4
Icons Used in This Book.....	5
Time to Get Down to Business . . . Intelligence .....	5

## *Part 1: Introduction and Basics.....* 7

### **Chapter 1: Understanding Business Intelligence .....** 9

Limited Resources, Limitless Decisions .....	10
Business Intelligence Defined: No CIA Experience Required .....	11
Pouring out the alphabet soup .....	12
A better definition is in sight .....	13
BI's Big Four .....	14
The BI Value Proposition.....	17
A Brief History of BI .....	18
Data collection from stone tablets to databases.....	18
BI's Split Personality: Business and Technology.....	21
BI: The people perspective .....	22
So, Are You BI Curious? .....	22

### **Chapter 2: Fitting BI with Other Technology Disciplines .....** 23

Best Friends for Life: BI and Data Warehousing .....	23
The data warehouse: no forklift required.....	24
Data warehouses resolve differences .....	26
All paths lead to the data warehouse .....	27
ERP and BI: Taking the Enterprise to Warp Speed .....	28
From mainframe to client/server .....	28
The great migration.....	29
Like it's 1999: the Y2K catalyst .....	30
Cold war reporting .....	31
ERP leads to the foundations of BI.....	31

<a href="#">Customer's Always Right .....</a>	32
<a href="#">CRM joins ERP .....</a>	32
<a href="#">Core CRM.....</a>	32
<a href="#">Customer decisions .....</a>	33
<a href="#">BI-BUY! E-Commerce Takes BI Online.....</a>	34
<a href="#">E-commerce's early days (daze?).....</a>	34
<a href="#">E-commerce gets smart .....</a>	35
<a href="#">Real-time business intelligence .....</a>	35
<a href="#">The Finance Function and BI.....</a>	36
<b><a href="#">Chapter 3: Meeting the BI Challenge .....</a></b>	<b>37</b>
<a href="#">What's Your Problem? .....</a>	37
<a href="#">What can go wrong.....</a>	38
<a href="#">The BI Spectrum — Where Do You Want It? .....</a>	40
<a href="#">Enterprise versus departmental BI .....</a>	40
<a href="#">Strategic versus tactical business intelligence.....</a>	43
<a href="#">Power versus usability in BI tools .....</a>	44
<a href="#">Reporting versus predictive analytics .....</a>	45
<a href="#">BI that's juuuuust right .....</a>	45
<a href="#">First Glance at Best (and Worst) Practices .....</a>	46
<a href="#">Why BI is as much an art as a science.....</a>	46
<a href="#">Avoiding all-too-common BI traps .....</a>	46
<a href="#">One more continuum: hope versus hype .....</a>	47
<b><a href="#">Part II: Business Intelligence User Models .....</a></b>	<b>49</b>
<b><a href="#">Chapter 4: Basic Reporting and Querying .....</a></b>	<b>51</b>
<a href="#">Power to the People!.....</a>	51
<a href="#">Querying and reporting in context .....</a>	52
<a href="#">Reporting and querying puts BI over the hump .....</a>	54
<a href="#">Reporting and querying toolkit characteristics .....</a>	55
<a href="#">So who's using this stuff? .....</a>	56
<a href="#">Basic BI: Self-Service Reporting and Querying.....</a>	58
<a href="#">Building and using ad-hoc queries .....</a>	59
<a href="#">Building simple on-demand self-service reports.....</a>	59
<a href="#">Adding capabilities through managed querying/reporting .....</a>	61
<a href="#">Data Access — BI's Push-Pull Tug-of-War .....</a>	63
<a href="#">Classical BI: pull-oriented information access .....</a>	64
<a href="#">Emerging BI: pushing critical insights to users .....</a>	64
<b><a href="#">Chapter 5: OLAP: Online Analytical Processing .....</a></b>	<b>67</b>
<a href="#">OLAP in Context .....</a>	68
<a href="#">OLAP Application Functionality .....</a>	68
<a href="#">Multidimensional Analysis .....</a>	70
<a href="#">Lonely numbers .....</a>	70
<a href="#">One-dimensional data .....</a>	70
<a href="#">Setting the table.....</a>	72

Seeing in 3-D .....	73
Beyond the third dimension .....	74
OLAP Architecture .....	75
The OLAP Cube.....	76
OLAP access tools .....	78
What OLAP Can Really Do.....	78
Members only .....	79
Remember the Big Four BI criteria.....	81
Drill team: Working with Multidimensional Data .....	81
Gaining insight through drill-down analysis .....	82
Going in the other direction: drill-up analysis .....	83
Getting to the source: drill-through .....	84
OLAP versus OLTP .....	85
Looking at Different OLAP Styles and Architecture.....	85
MOLAP: multidimensional OLAP .....	86
ROLAP: relational OLAP through “normal” databases .....	87
HOLAP: Can’t we all get along? .....	87
<b>Chapter 6: Dashboards and Briefing Books .....</b>	<b>89</b>
Dashboards’ Origins .....	90
EIS: information gold for the top brass .....	90
EIS: Everybody’s Information System .....	91
EIS gets left behind.....	92
The Metric System .....	93
Defining KPIs .....	93
Business KPIs .....	94
Looking at BI Dashboards .....	95
Mission control to the desktop .....	95
Dashboard best practices .....	97
Briefing Books and Other Gadgetry.....	98
<b>Chapter 7: Advanced / Emerging BI Technologies .....</b>	<b>101</b>
Catching a Glimpse of Visualization .....	102
Basic visualization.....	103
Worth a thousand words .....	103
Off the charts .....	104
Visualizing tomorrow.....	104
Steering the Way with Guided Analysis.....	106
Dancing the BI two-step .....	107
Old idea, new moves .....	108
Guiding lights .....	109
Data Mining: Hype or Reality? .....	109
Digging through data mining’s past .....	110
Digging for data gold.....	111
Data mining today .....	111
Other Trends in BI.....	113
BI for one and all .....	113
Unstructured data .....	113

**Part III: The BI Lifecycle ..... 115****Chapter 8: The BI Big Picture ..... 117**

So Many Methodologies, So Little Time .....	117
Starting at the beginning .....	118
The exception to the rule: Micro-BI .....	118
Customizing BI for Your Needs.....	120
Your not-so-clean slate .....	120
Initial activities .....	121
Could-be versus should-be alternatives .....	124
Selecting BI products and technologies .....	124
Implementing BI: Get 'er Done.....	125
Zeroing in on a technical design.....	126
Putting together the BI project plan .....	127
Finishing the job .....	128

**Chapter 9: Human Factors in BI Implementations ..... 131**

Star Techie: Skills Profile of a Core BI Team .....	132
Key performers .....	132
Your other techies .....	134
Overruling Objections from the Court of User Opinion .....	136
Ch-ch-ch-ch-changes .....	136
Turn and face the strange .....	137
Major in Competence .....	139
Find your center .....	139
A BI center that's juuuuuust right .....	141
Raising standards .....	141

**Chapter 10: Taking a Closer Look at BI Strategy ..... 143**

The Big Picture .....	143
Your Current BI Capabilities (or Lack Thereof) .....	144
Assessing your business infrastructure .....	144
Assessing the technology stack, top to bottom .....	147
Keep the good stuff .....	149
Throw out the bad stuff .....	151
Exploring "Should-Be" BI Alternatives.....	152
Utopian BI .....	153
Coming back to reality: examining barriers to achieving your desired future state.....	154
Deciding "Could-Be" Alternatives .....	155
Judging viability.....	155
Identifying risks . . . and also how to mitigate those risks .....	156
Gauging business value .....	156
Aligning your alternatives with your organizational structure and culture .....	157
Making your choice.....	158
Considering everything .....	158

Deciding on your strategy .....	159
Getting the necessary buy-in .....	159
<b>Chapter 11: Building a Solid BI Architecture and Roadmap .....</b>	<b>163</b>
What a Roadmap Is (and Isn't) .....	164
Centralized Versus Decentralized Architecture .....	165
A couple question .....	166
How to choose .....	166
BI Architecture Alternatives .....	168
Starting an architecture evaluation .....	168
So many choices .....	170
So little time .....	170
The short list.....	171
Taking a second look at your short list .....	172
Examining costs for each alternative.....	173
Looking at technology risks .....	174
Making your decision.....	175
Developing a Phased, Incremental BI Roadmap.....	175
Deciding where to start .....	176
Keeping score .....	177
Deciding what comes next .....	178
Deciding what comes next, and next, and next .....	178
Planning for contingencies .....	178
Dealing with moving targets .....	180
Leaving time for periodic “architectural tune-ups” .....	180
<b>Part IV: Implementing BI.....</b>	<b>183</b>
<b>Chapter 12: Building the BI Project Plan .....</b>	<b>185</b>
Planning the Plan .....	186
Revisiting the vision.....	186
Project plan format .....	187
Project Resources .....	187
Roles versus Resources .....	188
BI project roles .....	189
Project Tasks.....	191
First pass: Project milestones.....	192
Second pass: High-level tasks .....	193
Linkages and Constraints .....	195
Third pass: Break it down .....	195
Roles and skills .....	196
Risk Management and Mitigation.....	198
Contingency planning .....	198
Checkpoints .....	199
Keeping Your BI Project Plan Up to Date .....	199
Managing to the plan .....	200
Working through issues .....	200

Daily updates .....	200
Keeping task data up-to-date .....	201
Back to the Ol' Drawing Board .....	201
<b>Chapter 13: Collecting User Requirements . . . . .</b>	<b>205</b>
It's Business, Not Technical .....	206
Documenting business requirements .....	206
Document size and structure.....	207
A little help from your friends (and enemies) .....	208
Requirements-Gathering Techniques .....	208
The data difference .....	209
User focus.....	209
Requirements-gathering activities .....	210
What, Exactly, Is a Requirement? .....	213
Reporting and analytical functionality .....	214
Data needed to support your desired functionality .....	215
Matchup maker.....	216
The "look and feel" for how information should be delivered to users .....	217
Validating BI Requirements You've Collected .....	218
Conducting the initial double-checking.....	218
Prioritizing Your BI Requirements .....	218
Identifying "must-have-or-else" requirements .....	219
Getting the final buy-in .....	220
Stepping on the baseline .....	220
Changing Requirements .....	221
<b>Chapter 14: BI Design and Development . . . . .</b>	<b>223</b>
Successful BI .....	223
Be realistic.....	224
Follow demand .....	224
Act now, but think ahead.....	224
Design with Users in Mind .....	225
Power users.....	225
Business users .....	226
The middle class.....	226
Best Practices for BI Design.....	227
Designing the data environment .....	228
Designing the front-end environment .....	231
Getting Users On Board.....	239
Reporting review .....	239
Testing, 1-2-3 . . . . .	240
Pilot projects .....	242
Proof of concept .....	242

<b>Chapter 15: The Day After: Maintenance and Enhancement . . . . .</b>	<b>243</b>
BI = Constant Improvement .....	244
Post-Implementation Evaluations .....	244
Overall project review .....	245
Technology review .....	245
Business-impact review .....	246
Maintaining Your BI Environment .....	247
System health .....	248
System relevance — Keeping up with business changes .....	250
Maintaining lines of communication .....	250
Extending Your Capabilities .....	252
Expanding existing applications .....	252
Installing advanced upgrades .....	255
The Olympic Approach .....	256
Thinking long term with a roadmap .....	257
Evolvability .....	257
<b>Part V: BI and Technology .....</b>	<b>259</b>
<b>Chapter 16: BI Target Databases: Data Warehouses, Marts, and Stores . . . . .</b>	<b>261</b>
Data Warehouses and BI .....	262
An extended example .....	263
Consolidating information across silos .....	267
Structuring data to enable BI .....	270
Data Models .....	274
Dimensional data model .....	274
Other kinds of data models .....	278
Data Marts .....	279
Operational Data Stores .....	280
<b>Chapter 17: BI Products and Vendors . . . . .</b>	<b>283</b>
Overview of BI Software .....	284
The dimensional model .....	284
Working together .....	285
The BI Software Marketplace .....	286
A little history .....	286
Mergers and acquisitions .....	287
Major Software Companies in BI .....	289
Oracle .....	290
Microsoft .....	291
SAP .....	293
IBM .....	293

---

Pure-Play BI Vendors .....	293
Indispensable qualities .....	294
Vendors by strong suit.....	295
The sales pitch.....	300
<b>Part VI: The Part of Tens .....</b>	<b>301</b>
<b>Chapter 18: Ten Keys to BI Success .....</b>	<b>303</b>
Picking Good Key Performance Indicators (KPIs) .....	303
Adjusting the Recipe.....	304
Coming to Terms with Complexity .....	304
Thinking (and Working) Outside the Box .....	304
Picking a Winning Team .....	305
Doing Your Homework.....	305
Remembrance of Things Past (Especially Mistakes).....	305
Considering Corporate Culture Completely .....	306
Just Going Through a Phase .....	306
Adopting a Bigwig .....	307
<b>Chapter 19: Ten BI Risks (and How to Overcome Them) .....</b>	<b>309</b>
Resistance Movement.....	309
Moving Targets .....	310
Tool Letdown .....	310
Being a User Loser .....	311
Mister Data Needs a Bath.....	312
Dough a No-Go? .....	312
Scope Creep .....	313
Rigidity .....	314
Environmental Crisis .....	314
<b>Chapter 20: Ten Keys to Gathering Good BI Requirements .....</b>	<b>315</b>
All the Right People .....	316
The Vision Thing .....	317
Connecting BI to the Business Themes.....	317
Make Sure the Insights Are Within Sight .....	318
Greatest Hits from Yesterday and Today .....	319
Consequences of Going Without .....	319
What's the Big Idea?.....	320
Going Straight to the Source.....	320
Adjunct Benefits .....	321
What's First and Why.....	322

<b>Chapter 21: Ten Secrets to a Successful BI Deployment .....</b>	<b>323</b>
Start Early!.....	323
Get What You Paid For.....	324
Only Losers Ignore Users .....	324
Name-Dropping.....	325
Testing 1-2-3 . . . 4-5-6 . . . and So On .....	325
Go to Battle from a War Room .....	326
Project Management Management .....	326
Deal with Any Foot-dragging Immediately! .....	327
Prove That Concept! .....	328
The Devil Is in the Details .....	328
We've Got a Live One .....	329
<b>Chapter 22: Ten Secrets to a Healthy BI Environment .....</b>	<b>331</b>
Data TLC.....	331
Hitting Budget Targets .....	332
Hitting Schedule Targets .....	333
Rinse and Repeat.....	333
Rinse and Don't Repeat .....	334
Maintain Team Knowledge.....	334
Remember What You Forgot the First Time .....	335
Regular Updates .....	335
Staying in Touch and in Tune .....	336
Communicating Changes.....	336
Stay on the Train .....	337
Maintenance as a Process .....	337
<b>Chapter 23: Ten Signs That Your BI Environment Is at Risk .....</b>	<b>339</b>
The Spreadsheets Just Won't Die.....	339
Everybody Asks for Help.....	340
Nobody Asks for Help.....	340
Water-Cooler Grumbles About Usability.....	341
Good-Old-Day Syndrome .....	341
Usage Numbers Decline Over Time .....	342
BI Tools Aren't Part of Strategy Discussions .....	342
Executive Sponsors Lose Enthusiasm .....	343
Executive Sponsors Lose their Jobs .....	343
Resistance to Upgrades and Expansion .....	344
<b>Index.....</b>	<b>345</b>



# Introduction

---

**L**et's get this joke out of the way right now. Business intelligence is indeed an oxymoron at many companies.

You've worked for that company before, or maybe you work there now. That company is a boat on top of an ocean of data that they're unable to dip their cups into and drink. And because they're so out of tune with the data flowing through their systems, they base their decisions on gut feel rather than facts and history. The most common analysis tool is a spreadsheet. They take wild stabs in the dark at what the long-term trends look like for sales, or profit, or some other measurement. And speaking of measurement, they often measure the wrong things entirely; they look at numbers that have little or no relationship to the long-term success of the business.

Welcome to *Business Intelligence For Dummies*, a book written for people in organizations that want to break the cycle of business stupidity. If you picked this book up off the shelf, you've probably heard of BI but aren't sure what it means. Sure, it's got the feel of another one of those techno-buzzwords that will fade out of fashion in a few years.

But BI is here to stay. And this book is for executives and managers dying to learn more about the technologies, tools, processes, and trends that make up business intelligence. It's for business people who need a way to derive business insights that are accurate, valuable, timely, and can be acted upon to positively influence the enterprise.

Maybe you've heard talk of BI in the hallways and want to learn more about it. Maybe you've come to the realization that more and more jobs require some knowledge of BI. Maybe somebody gave you this book for Christmas and you don't have the heart to ask for a gift receipt. No matter how you came by it, you'll learn a lot by reading it; there's a lot to know.

Be aware that if you're looking into how to spy on the company next door, if you want to talk into a shoe phone at the office, or you're looking for advice on how to dig through dumpsters to find clues about your competition, you'll want to move on down the shelf. We're not talking about *that* kind of business intelligence.

## About This Book

This is a business book. Sure it's a book about technology, but it's not a highly technical book. It's not supposed to be. The whole idea is to make some fairly confusing topics accessible to the non pocket-protector set. If you're a Microsoft SQL Server administrator and you think this book is going to show you how to extend UDM with SSAS stored procedures, you're bound to be disappointed.

But that's what's so great about this book. It separates out the eye-crossing, head-scratching technical jargon and puts important technology concepts into terms most business people with a modicum of technical knowledge can understand.

## How to Use This Book

If you don't know how to use a book, you're a long way from needing *business intelligence*, buddy. It's like other books; it's got a cover, chapters, pages, words, and an extraordinarily handsome and well-regarded author.

But I guess there are a few reading strategies that will suit you best depending on what you're looking to get out of *Business Intelligence For Dummies*. Consider these two pathways to BI enlightenment with this book:

- ✓ If you want to see a specific topic that's come up in conversation around the water cooler, or perhaps in a meeting, you can jump right to the chapter that covers it and start reading. For example, maybe there's been a lot of chatter about OLAP or Dashboards in the office and you've been nodding your head acting like you know what those words mean. I'd advise you to move quickly to the chapters covering those topics before someone learns your secret.
- ✓ If your agenda has more to do with getting the big picture, and you want to see BI's origins and context before moving through the topics, that works too. The chapters are self-contained vehicles of knowledge, but they are ordered in such a way that one BI topic blends nicely into the next. On the other hand, if you start reading about something that puts you to sleep or makes you mad, by all means write your Congressman a strongly-worded note, then skip ahead to the next chapter. Hey, you did it in high school when you had to read *A Tale of Two Cities*, so nothing's going to stop you from doing it here.

I would not, however, advise that you skip ahead to the last few chapters to see how the story turns out. Although the end of the book is riveting and ties up a few loose ends, it's not really that kind of book.

There are a few important related books that expand on some of the topics contained in this book. If you find the need for additional information, *Data Warehousing For Dummies*, (Wiley) is a few years old but provides a solid foundation of knowledge for data integration topics. Then there are the product specific books that touch on technical topics related to BI like Mark Robinson's *Microsoft SQL Server 2005 Reporting Services For Dummies*.

## How This Book Is Organized

The information presented in this book is arranged into six self-contained parts, each of which comprises several self-contained chapters. It's like one of those Russian dolls, except painted yellow and black, and made out of paper instead of . . . well . . . whatever they make those dolls out of.

For most of the book, you'll be able to consume a chapter whole; I do my best to tell you everything you need to know inside each chapter without forcing you to save places throughout the book with various fingers and ad-hoc bookmarks. But I admit, on occasion I'll refer you to another area in the book because it's really important you understand where to get more information about a subject; but if you don't feel like being re-directed, just say no to cross-referencing.

### Part I: Introduction and Basics

These early chapters are a primer on business intelligence. They lay the BI groundwork and will keep you covered if you need a quick knowledge injection before you run to a meeting or an interview where the topic will come up. You'll see the one true definition of BI, at least according to me and a few thousand BI gurus. You'll also get to know BI's family tree, where it all began, and what related technologies you should get to know.

You'll be especially pleased at the easy-going language and tone of these chapters. Not much bits-and-bytes talk is necessary because, as you'll see in Part I, business intelligence is about business first, technology second.

### Part II: Business Intelligence User Models

Unfortunately, you'll find out in Part II that a business intelligence environment doesn't just hum along quietly in the background like an air conditioner, spitting out business insights and cool air. BI joins powerful tools to the fingertips and eyeballs of people just like you, who go to work every day and need to make better business decisions, regardless of the scale or scope of those decisions.

Each of the main user application classes gets its own chapter here, from basic reporting and querying up to new-fangled technologies just now emerging into the market place.

## ***Part III: The BI Lifecycle***

More than anything, business intelligence is a process. It's about creating a culture that makes evidence-based rational decisions, that seeks out a clearer picture of its past and present. In this part we'll talk about what makes that process work well inside organizations, how a business intelligence culture gets planned, hatched, and how it grows and develops over time. You'll see what substrate works best for BI to take hold, and how to develop a sound business intelligence strategy. In the last chapter in this part, you'll get familiar with a BI roadmap, which sets you up nicely for the next part . . . read on!

## ***Part IV: Implementing BI***

This is how we do it. If you're a project manager or analyst of some kind, this part will warm the cockles of your heart. We're talking about building a sound project plan for your upcoming BI implementation and gathering — and managing — the functional and business requirements. If that sounds like any other IT project to you, you're half-right. BI projects share characteristics with other big technology efforts, but BI has its own special set of challenges for a project team to face down, and we'll talk about them here. Designing and building a BI environment is no easy task, but following up your initial success with ongoing victories is even harder.

## ***Part V: BI and Technology***

This is a special topics part, where we delve into areas that every budding BI guru should know about, but for the dabblers and dilettantes, they're on a need-to-know basis only. The BI universe tracks closely with that of data warehousing, and that topic gets covered in depth in this part of the book. It's also here that we start naming names, talking about who the big BI vendors are, what you should know about their products and services, and what they have to offer the market place.

## ***Part VI: The Part of Tens***

If you've never read a book in the *For Dummies* series, this will be a nice surprise. If you have read another book in the series, this part will be like seeing an old friend again . . . one who doesn't owe you money that is.

The Part of Tens, as always, is a collection of interesting BI topics, challenges, and warnings broken out into ten easy-to-digest chunks. There are ten keys to BI success, ten secrets to gathering good BI requirements and the like. These chapters are a good chance to test your knowledge after you've read the rest of the book, or a way to get a jolt of BI know-how if you haven't.

## Icons Used in This Book

Look for those familiar *For Dummies* icons to offer visual clues about the kind of material you're about to read:



The best advice in the book is listed next to this icon. If you're thinking about a foray into BI, you're going to need it.



I can't quite recall what this icon means, but I think it has something to do with quickly revisiting an important BI concept. Don't forget to remember these things.



If BI was easy, every company out there would have implemented it long ago. This icon is the equivalent to a flashing red light on your dashboard. Ignore it at your own peril.



Every now and then I'm forced into some techie banter to add some color and background to a topic. You should try to read it one time, but don't get upset if it floats over your noggin at high altitude.

## Time to Get Down to Business . . . Intelligence

If you feel the need for speed — getting up to speed on BI that is — you're off to a good start, so let's light this candle.

Now I'd like you to take a moment and go back and review the table of contents one more time. Just kidding! March onward. Start with the first page of Part I or flip to a random page and start reading to see if it makes the slightest bit of sense to you. I'll endorse whatever reading strategy you have in mind, just have fun. Oh what heights you'll hit, so on with the show, this is it. *Drumroll*. . . .

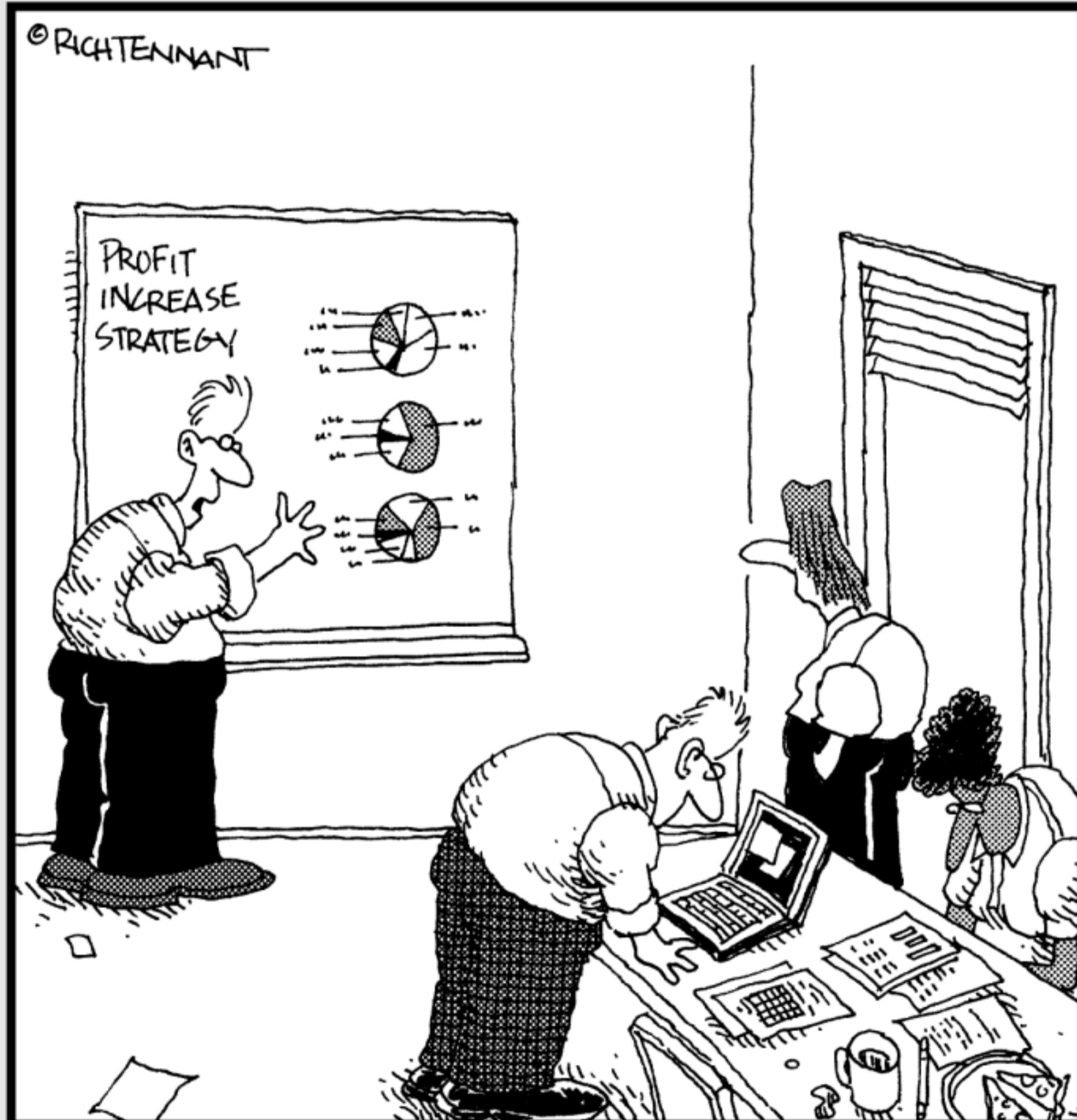


# Part I

# Introduction and Basics

## The 5<sup>th</sup> Wave

By Rich Tennant



"Look—what if we just increase the size of  
the charts?"

## *In this part . . .*

**Y**ou've been running your lemonade stand for several years, and success has been an occasional visitor. This being the high-tech age, you've dutifully recorded business data of every kind since you started mixing sugar and water together; the daily sales, the employees who have come and gone, the customers who frequent your street corner, the supplies you buy once a week to mix your elixir.

So how can you put all that information to work for you? Some of the data's on your laptop, some of it's on your desktop at home, and a little bit of it is on your handheld. It would be nice to be able to look into the past and find meaningful insights about what's made your lemonade stand successful in the past, and what might make it more successful in the future. That might help make decisions easier.

You need a business intelligence solution. The chapters in this part will show you what BI is, how it's related to other technology areas, and how it can work for lemonade stands just like yours.

## Chapter 1

---

# Understanding Business Intelligence

---

### *In This Chapter*

- ▶ Getting comfortable with the basics
  - ▶ Understanding the business intelligence value proposition
  - ▶ Seeing where BI came from and where it's going
  - ▶ Previewing what works (and what doesn't)
- 

**F**rom the CEO down to the lowest levels of any organization, every minute of the day someone is making a decision that has an impact on the company's performance. Sometimes a decision is at a very high strategic level that affects the fate of the entire organization, and other times a decision might be narrowly defined and tactical, affecting a single person or department for a very short window of time. When taken together, these decisions make up a significant portion of the "day in the life" at any given organization, be it a company, governmental agency, or nonprofit organization.

In spite of the dramatic advances in technology and tools that aid in the decision-making process, however, far too many people still make decisions the old-fashioned way: by blending a gumbo of tidbits of current information, best recollections of the past, advice from others, and a whole lot of "gut instinct," and then assessing which path is likely to give the best possible outcome for the decision at hand.

Decisions drive organizations. Making a good decision at a critical moment may lead to a more efficient operation, a more profitable enterprise, or perhaps a more satisfied customer. So it only makes sense that the companies that make better decisions are more successful in the long run.

That's where business intelligence comes in.

Business intelligence is defined in various ways (our chosen definition is in the next section). For the moment, though, think of BI as using data about yesterday and today to make better decisions about tomorrow. Whether it's selecting the right criteria to judge success, locating and transforming the

appropriate data to draw conclusions, or arranging information in a manner that best shines a light on the way forward, business intelligence makes companies *smarter*. It allows managers to see things more clearly, and permits them a glimpse of how things will likely be in the future.

## Limited Resources, Limitless Decisions

All organizations, whether business, government, charitable, or otherwise, have limited resources for performing their missions. Companies are forced to make do with what they have — all the time. You can't put a Nobel laureate in every position, and you can't pour unlimited dollars into an endless quest to make all your factories and offices more efficient.



The most precious resource is *time*. The marketplace is in constant motion, and companies must not only move correctly, they must move quickly. Otherwise competitors will fill any available vacuum in the market, resources will get used up, and your organization will inexorably wither away.

Business intelligence's entire *raison d'être* (that's French for "shade of lipstick" — just kidding) is as an ally at those inflection points throughout the life of a business where a decision is required. Business intelligence is a flexible resource that can work at various organizational levels and various times — these, for example:

- ✓ A sales manager is deliberating over which prospects the account executives should focus on in the final-quarter profitability push
- ✓ An automotive firm's research-and-development team is deciding which features to include in next year's sedan



### The Name Game

Business intelligence is commonly known simply as BI. That's pronounced "Bee Eye," not "Buy." We'll go back and forth in this book between the full phrase and the abbreviated name. And if you're wondering why there aren't any periods in the acronym (as in, "B.I.") it's because of a custom in the technology world: Once a concept has gained widespread acceptance and becomes known by its initials alone, the punctuation disappears.

Extracting periods from techno-acronyms (CPU, GB, ICBM, whatever) is the mission of the International Punctuation Review Board, a group of Internet billionaires, former ambassadors, and high school football coaches who meet in Geneva every four years to review which new buzzwords qualify for punctuation-free status. (Just kidding. Everything about acronyms in the *previous* paragraph is true but the Board doesn't really exist. Yet.)

- 
- ↗ The fraud department is deciding on changes to customer loyalty programs that will root out fraud without sacrificing customer satisfaction

The decisions can be strategic or tactical, grand or humble. But they represent two roads diverging in a yellow wood: Considered in the aggregate, the roads taken and those not taken represent the separation between successful and unsuccessful companies. Better decisions, with the help of business intelligence, can make all the difference.

## ***Business Intelligence Defined: No CIA Experience Required***

So what the heck *is* business intelligence, anyway? In essence, BI is any activity, tool, or process used to obtain the best information to support the process of making decisions.

Right now you're scratching your head and wondering, "Does he really mean *anything*?" And the answer is a qualified yes. Whether you're calling the Psychic Hotline, using an army of consultants, or have banks of computers churning your data; if it helps you get a better handle on your company's current situation, and provides insight into what to do in the future, it's BI.

But by popular demand (and so I don't have to write a chapter called "Using a Magic 8-Ball for Improved Portfolio Risk Management") we'll narrow the definition just a tad. For our purposes, BI revolves around putting computing power (highly specialized software in concert with other more common technology assets) to work, to help make the best choices for your organization. Okay, there's a little more to it than that. But before digging into specifics, it is (as the Magic 8-ball would say) decidedly so that you should understand some context about how BI is defined, and who's defining it.

The more you learn about BI, the more likely you are to encounter a wide swath of definitions for the term. Sometimes it seems as if nearly every new article on BI characterizes it in a new way. BI invariably gets unceremoniously tagged with an array of newfangled labels and connected with a whole catalog of different technologies that can leave your head spinning as you try to peg which elements are included in the definition and which ones aren't.

And it's no mystery why there is no single definition for business intelligence. Vendors and consultants define the phrase in a way that conveniently skews toward their particular specialty. Academics, authors, and consultants also have their own pet definitions of BI; one may barely resemble the next.

Don't get knocked off course. Regardless of who's saying it, when you put BI on a stove, turn the heat up, and boil it down to its constituent elements, you'll always find the same thing left in the pot: technology and tools to support decision-making.



For the purposes of this book, and for your needs beyond this book, you'll only need to know this one single definition (drum roll, please):

*Business intelligence* is essentially timely, accurate, high-value, and actionable business insights, and the work processes and technologies used to obtain them.



If you look up *actionable* in the dictionary, you see it actually means any deed that might cause you to get *sued*; here *action* refers to *legal* action. But feel free to use this specialized meaning of "actionable" with BI-savvy pros such as techies and finance folks. Just don't use it when you're talking to an attorney (unless, of course, you're a partner in the same law firm).

Contrary to what you may have been led to believe, there are no stone tablets with a single list of processes, protocols or hardware/software combinations that define BI once and for all. In technology, those things are always evolving. And they are often different from company to company, and different depending on the situation. Today's common definitions of the essential BI components are markedly different from the definitions bandied about in the 1990s. What remains constant, though, is that BI's purpose has always been to produce *timely, accurate, high-value, and actionable information*.

## Pouring out the alphabet soup

If you think BI's definition sounds a little familiar, it's not just a case of *déjà vu* (that's French for "I've had this head cold before"). The concept of BI is not necessarily new; companies have been trying for years to press their systems into service to produce better strategic insights. You might have come across some of these acronyms in your past.

- ✓ **DSS:** Once upon a time, a company was in need of systems that would support the decision-making process. The IT crew got together and came up with Decision Support Systems. Pretty clever, eh? DSSs gained popularity by helping managers apply computing power and historical data to structured problems, such as production scheduling and other types of recurring planning decisions.
- ✓ **EIS:** The corner-office gang took notice of the success of DSS and decided that just like executive bathrooms, they deserved their own decision-management tools, and Executive Information Systems (EIS) technology was born.

✓ **MIS, MDS, AIS, and so on:** Plenty of other BI predecessors came and went — Management Information Systems, Management Decision Systems, Analysis Information Systems, and so on, and each one laid claim to some new style of supporting companies' decision-making processes.

Business intelligence has a big family tree. All of these technologies contributed to today's incarnation of BI, some more than others. And some of the disciplines and movements that warranted their own acronyms still exist today — in some cases calling themselves “next-generation BI” or, at the very least, “extenders” of BI.

There are several forces driving the multiple incarnations of what is basically the same idea. First, there is a motivation among vendors and IT consultants to mint a phrase that catches on in the technology world. Doing so helps set them apart from the competition (as if they've invented a better mousetrap).

Perhaps more important — and more cynical — is the tendency within the technology world to sheepishly leave behind heavily hyped initiatives that don't quite live up to the buzz in their initial go-around. For example, earlier generations of DSS and EIS often suffered from the same shortcomings that affected all types of technology implementations in that era. The unknowns of cutting-edge technology, the unpredictability of organizational politics, and other deficiencies sabotaged early implementations. The ideas were sound, but the failures gave the specific concept being adopted a bad reputation.

But the underlying concepts would always survive. After all, who could argue with the value of using high-power computing to support decisions? What executive wouldn't want to put IT resources to work delivering valuable information to the office every day? And so, as memories of past failures faded, new ways of thinking evolved — and more advanced technologies came along — those same vendors and consultants would leave behind the now-tainted label, coin a new term, and begin selling the “new and improved” solution.

## *A better definition is in sight*

It might be useful to take a quick second look at the term *insight*. Insights are the ultimate destination for the many roads that all those authors, consultants, vendors, and various other nerds will send you down when you embark on a BI project. “Insight” does a good job of encompassing the deliverables that flow forth from a good BI project. Imagine those as the glowing light bulbs that appear over your head about some aspect of your business. Insights are a new way to look at things, a moment of clarity, a way forward. When BI delivers a business insight, you've divined some fact or hypothesis about some aspect of your organization that was previously hidden or unknowable.

*Insights* is actually a more intelligent word than . . . well . . . *intelligence*. After all, “intelligence” can mean so many different things, depending on the context. So the next time you think about BI and an instant of confusion obscures its definition from you, it helps to mentally substitute the word *insights* for *intelligence* and just attach BI to the phrase *business insights*.



But the good news is, with the kind of BI we’re describing here, you don’t *have* to play James Bond to improve your market position. With the real business intelligence, there are no double agents, no foreign sports cars, and the word “detonator” will never be relevant (unless your project goes *very* poorly.) BI is kind of like spying — but only if spying on *yourself* counts.

If your BI project goes well, you can ask your boss to start calling you “Q”.

## BI’s Big Four

So what do we mean when we talk about insights that are accurate, valuable, timely, and (benignly) actionable? As you dig into BI’s main characteristics, you’ll see why each is so important to the process. In fact, if the knowledge gained from BI fails to meet any of the four criteria, the process has failed.

### Accurate answers

When decisions are taken in your organization they are inevitably informed with conclusions drawn by a range of experts using important pieces of information about the enterprise’s current state. For BI to be of any value in the decision making process, it must correctly reflect the objective reality of the organization, and adhere to rigid standards of correctness. As such, the first hallmark of insights produced from BI processes is their accuracy.

As with any technology-related tool or process, the GIGO rule is in full effect with BI — that’s Garbage In, Garbage Out. GIGO says that if the BI insights are not accurate, the decisions made are less likely to be the correct ones for your enterprise. Imagine a sample BI report that shows one of the company’s sales territories lagging woefully behind the others. When folded into the decision-making process, that piece of knowledge might well lead executives to adjust the sales process (or perhaps the personnel). But if the picture is wrong — say the offices and departments were incorrectly aligned to the various territories, so sales dollars weren’t correctly allocated — then the conclusions (and the resulting actions taken) not only fail to help the company, they might actually make things worse.

Getting it right is important from a political perspective as well. For BI to have an impact, company *stakeholders* (those key employees whose business domains affect, and are affected by, BI) must trust it. Nothing’s more frustrating in the world of business intelligence than a development team toiling for months to produce a report that an executive looks at and, within 30 seconds, dismisses it by saying, “Those numbers aren’t correct.”

But such things are common. After all, BI insights are often surprising, counterintuitive, and even sometimes *threatening* to groups within an organization. The sales manager who is shown numbers that indicate her team is lagging behind will be motivated to find ways to challenge the validity of the report. Any errors, no matter how small, will call into question the veracity of the conclusions drawn from the data.

BI must represent the absolute closest thing to the truth that's possible, not only to produce results, but to protect its reputation among the skeptics! Without accuracy, insights that are the product of BI are worse than worthless. They can be harmful to the company. And once that happens, nobody will ever trust BI again.

### ***Valuable insights***

Not all insights are created equal. Imagine, for example, that after a multimillion-dollar BI-driven probe of sales-history data, a grocery store chain finds that customers who bought peanut butter were also likely to buy jelly.

*Duh.*

BI insights like this are certainly accurate, but they are of limited value to the decision makers (who probably know that most supermarkets place those two items close together already). Part of what distinguishes BI is that its goal is not only to produce correct information, but to produce information that has *a material impact* on the organization — either in the form of significantly reduced costs, improved operations, enhanced sales, or some other positive factor. Further, high-value insights usually aren't easily deduced — even if data-driven analysis weren't readily available.

Every company has smart people working for it who can connect the obvious dots. BI insights aren't always obvious, but their impact can be huge.

### ***On-time information***

Have you ever had a heated discussion with someone and thought of the perfect retort to their witless argument exactly five minutes after you walk away from them?



The French call this phenomenon "*esprit d'escalier*" — (the spirit of the staircase). You never think of your best comeback until you've left a person's apartment or office and are walking down the stairs in defeat.

The lesson is simple: What makes people effective in a debate is that they can not only deliver sound information, they can do it at the precise time it's needed. Without timeliness, great verbal pugilists like Oscar Wilde or Cicero would have gone down in history as nothing more than good (but obscure) writers full of *esprit d'escalier*.

In business, information delays can make just as big a difference — and they can come in many forms:

- ✓ Sometimes it's a technology problem where the hardware or software can't compute fast enough to deliver information to users.
- ✓ Sometimes the problems relate strictly to workflow and logistics; the data isn't fed into the systems often enough.
- ✓ Logistics problems can pop up from time to time — for instance, what if a report has to be translated into a different language?



Every step in the process takes time, whether it involves microchips or humans. In the aggregate, those time intervals must be small enough to make the output of a BI process still relevant, useful, and valuable to a decision maker.

Timeliness is as important a quality in your business insight as any other. The best decision support processes involve up to the minute information and analysis made available to decision makers in plenty of time to consider all the courses of action. Stock traders at hedge funds use massive spreadsheets full of constantly updated data. The data streams in and is manipulated in a series of processes that makes it usable to the trader. He or she buys and sells stocks and bonds using the results of those calculations, making money for the firm and its clients. If the trader's applications were slower in producing translated data, they would miss opportunities to execute the most profitable trades and their portfolios would start to look like ones the rest of us have.

### ***Actionable conclusions***

Accurate is one thing, actionable is another. Imagine if the conclusions reached at the end of the BI cycle were that the company would be better off if a competitor would go out of business, or if one of its factories were 10 years old instead of 30 years old.

Those ideas might be accurate — and it's no stretch to believe that if either scenario came to pass, it would be valuable to the company. But what, exactly, are the bosses supposed to do about them? You can't wish a competing company out of business. You can't snap your fingers and de-age a factory. These are exaggerated examples but one of the biggest weaknesses of decision support tools is that they build conclusions that are not *actionable*. To be actionable, there has to be a feasible course that takes advantage of the situation. It has to be possible to move from conclusion to action.

Ideally, the BI team at your company would produce a report that would guide future actions. The executives would conclude that a price should be lowered, or perhaps that two items should be sold as a package. These are simple actions that can be taken — supported by BI — to improve the position of the company. In BI-speak, that means insights must be *actionable*.

## The BI Value Proposition

BI links information with action inside an organization. But because of the confusion over defining BI, it's not always clear where the value of a BI solution lies. What exactly do businesses *get* from a BI implementation? If you're thinking about BI, you're naturally wondering "What's in it for me?"

The answer is that when companies utilize BI, they don't just have a swell new toy for the IT team to deploy, or a snazzy new report or data store. Sure, it can be all of those things, but more than anything, the BI value comes from promoting good decision-making habits.

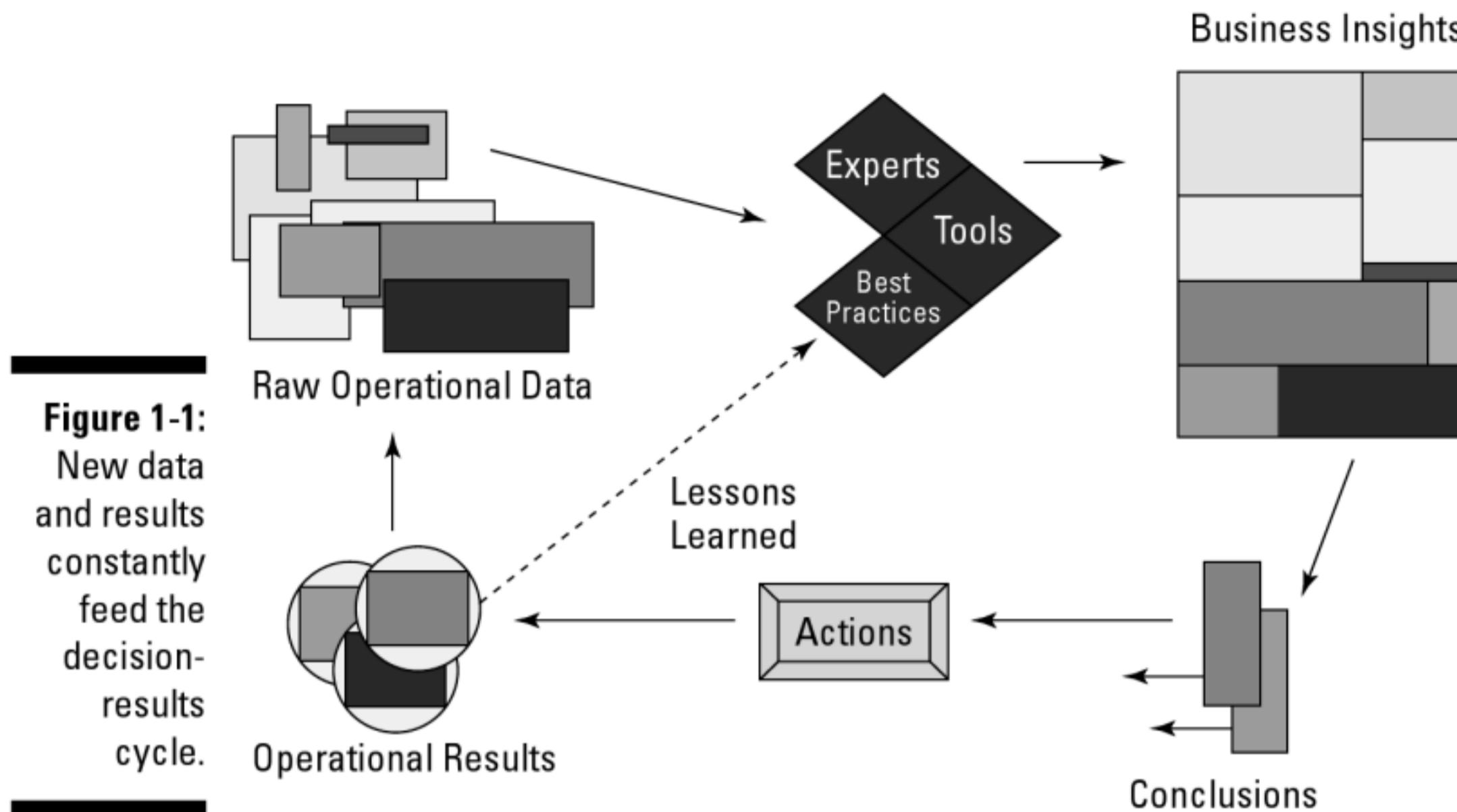
Encompassing BI is a rational approach to a continuous improvement loop:

1. Gathering data
2. Making decisions and taking action based on that data
3. Measuring the results according to predetermined *metrics* (a fancy word for measurements) for success
4. Feeding the lessons from one decision into the next

By using a continuous cycle of evidence-based actions, organizations adopt a rational approach to their decision-making process — and BI can support that cycle. Figure 1-1 shows how this continuous loop can work. Through business intelligence concepts and tools, companies glean meaningful insights from their operational data. If the insights fit the four criteria of BI (remember: *timely, accurate, high-value, and actionable*) the company can apply them to its regular decision-making process. Those decisions, now informed with BI insights, lead to actions — and, if all goes well, improved operational results. (Don't lose sight of the fact that improved results are what this is all about). And so the cycle begins anew; the first round of results becomes part of the historical data record, and the related BI insights are refined even further.

The process of using data to make better decisions can involve just about any piece of an organization. If there are lessons to be learned from operational data, be it customer behavior, financial information, or another category, BI can play a part. By using BI practices to transform raw data into meaningful conclusions, a team makes better decisions. The actions taken as a result of those decisions produce a new round of results — which can be fed back into the system as new empirical evidence to draw the next round of conclusions.

BI can improve any decision by supplying it with (everybody, now!) *timely, accurate, valuable, and actionable* insights.



## A Brief History of BI

Business intelligence is an approach to solving business problems. It's a framework for managing tactical and strategic operations performance. BI is only possible because of advances in a number of adjunct technologies, such as computing power, data storage, computational analytics, reporting, and even networking technologies. But its origins are definitely more humble. In this section we'll take a look at how BI evolved to where it is today.

### *Data collection from stone tablets to databases*

From the beginning of history, organizations have always had a need to collect and store data. Several thousand years ago, there were armies and imperial bureaucracies, working out ways to collect taxes, feed people, wage wars, and so on.



The first recorded use of written language was data storage: Sumerian stone tablets that tracked shipments of wheat through the local granary.

Data storage started as a notion of faith, an act of foresight and planning by the world's earliest worry-warts and packrats. (It might not have seemed important to remember the names and hometowns of the soldiers in the Praetorian Guard of the Roman Empire, but somebody realized they'd get a lot better turnout at the 20-year reunion if they made an effort to collect and keep that information. That toga-wearing bureaucrat would have loved BI.)

## Available research on BI

You can look up all kinds of research and white papers on the Internet to check out the impact of BI on business. But don't just skim through the study looking for the return-on-investment (ROI) number without understanding the context. Numerous important peer-reviewed studies show that BI projects have a positive ROI, provided they are done correctly, and with the

proper goal in mind. When BI produces timely, accurate, high-value, actionable conclusions, and those conclusions are applied correctly, the ROI will be positive. But lots of things can go wrong along the way. For every BI success story, there are horror stories, just as you find with any other technology. So how do you do it right? How can you maximize ROI? Read on . . .



Record-keeping really came into its own as better forms of paper were invented. It allowed for more information to be stored and accessed in a smaller space.

Reading a book written on stone tablets is a real pain in the neck.

From silicon in *stone* to silicon in *microchips*, that challenge continues to this day: storing more and more information in smaller and smaller space. The modern organization makes use of computer power for its data storage.

### ***The growth of computing power and data storage***

The first computers were tabulating machines, designed and built to perform one-off calculations. But scientists and inventors developed information-storage capability almost neck and neck with the growth of computing power. After the 1940s, both technologies exploded.

Mass storage began to take form when the properties of magnetic tape were used to store analog patterns of information. That turned to disk drives, a decades-old technology that is still in use today in a form that would be recognizable to its inventors, but on a scale that would blow their minds.

To manage the growing mountains of stored data, programmers developed Database Management Systems (DBMSs) of growing power and complexity. Relational database technology came about as a response to the increasing information-storage demands. This was a revolutionary way to maintain data that dramatically sped up transaction time by splitting data elements into their component pieces and storing those pieces separately.

### ***Transactional systems***

As computing systems became more powerful and ubiquitous, businesses began taking advantage of them to manage their daily transactions.

*Point-of-sale* (POS) systems are the classic example of a transactional system. A POS system has one main purpose: to allow sales reps to quickly enter sales transactions, collect payment, and issue a receipt to the customer for that purchase. Handily enough, if the POS is some kind of computer (rather than just a cash register that goes *cha-ching*) it can be connected with accounting systems that gather and organize sales information for later use.

Companies normally have many transactional systems, each one a source of its own unique kind of data, each one designed to perform one primary business role. Transactional systems help with the day-to-day operations of the company — for example, a system that tracks shipments between warehouses or handles customer billing.

### ***The emergence of decision support***

With so many disparate transactional systems, a company stores an enormous amount of data. It didn't take long before CEOs wanted to take a peek. After all, if they could see summaries of all that stored transactional data, they could gain insight on certain aspects of their business (say, how often shipments move between Warehouse A and Warehouse B, or what day of the week their customers are more likely to buy dessert). Examining transactional records in the aggregate seemed to offer a wellspring of good business insights. But no sooner did companies try it than a horde of problems sprang up — for example, these:

- ✓ The systems were often separated, not only physically, but perhaps also by separate storage protocols, naming conventions, or even political barriers within a company. That meant the analysis had to take place individually for each set of transactional records.
- ✓ Transactional systems such as the point-of-sale database were designed for speeding transactions along — not for doing research. Digging through the data to learn which products appealed enough to certain demographics to purchase at certain times of the year (or to unearth other such business insights) was undeniably useful, but a transactional system by itself was the wrong tool for that job. More powerful information systems were necessary to get the most out of the data.

In the late 1980s, companies began to recognize the potential value that the data represented. In response, they became motivated to build systems to extract the knowledge buried in their files. And so BI was born.

Business intelligence came to encompass the wide range of technologies, protocols, and practices that is required to produce valuable business insights. What BI actually means to one company may be different from what it means to another because every company represents a different situation, with different installed technology, and different needs. That's why business intelligence doesn't fit into a perfect definition you may have read on a vendor's website. BI means timely, accurate, high-value, and actionable insights . . . and whatever it takes to produce those insights.

### *BI in the by-and-by*

As computing gets more powerful and software more useful, it seems BI — whether operating under its current name, or dressed up yet again as a “new” undertaking — will continue to increase in importance to large organizations. But look for it to take root in ever-smaller enterprises as well, as small businesses realize they can finally take advantage of the advancing technology.

The BI concept is a flexible organism that will undoubtedly grow and evolve in response to whatever direction the advancing technology may take it. Some near-term trends seem apparent:

- ✓ **Origins in various business units:** BI started as IT pet projects. After all, who else knew what was possible? But as executives and decision makers get used to thinking in terms of business intelligence, more (and bigger) BI initiatives will be driven by departments other than IT.
- ✓ **Analytics delivered to the desktop:** Vendors have created powerful add-ins to go with already-flexible and potent desktop tools (such as Microsoft Excel). Starting with MS Office 2003, continuing with Office 2007, advanced analytical tools will be available to just about everyone in the company who has a computer.
- ✓ **Following the data:** BI has traditionally been associated with data-warehousing technology (which we discuss in depth in the coming chapters). But future BI technology will be able, with increasing efficiency, to reach out into the source systems, grab data, and transform what it finds into what it needs to perform its analysis.

## *BI's Split Personality: Business and Technology*

BI is built on the massive computing power available to today’s enterprises. But it isn’t just about bits and bytes. Business intelligence requires a company culture dedicated to the principles and practices that make high-quality, usable insights possible. Simply installing software and flipping a switch won’t get a company to the promised land.

The commitment to BI has to come from both the business *and* technology sides of a business:

- ✓ Business managers must engender a rational, measurement-based approach to setting strategy and running operations.
- ✓ IT must be prepared to support the BI culture to the extent that business managers are prepared to push it into all levels of the company.

## *BI: The people perspective*

Business intelligence is about giving people new tools and perspectives; it's designed to let decision makers ponder what-if questions. That only works if those decision makers are not only able to use the BI tools but are also prepared to ask the right questions.

That's where BI truly straddles the world between business and technology — it's both an art and a science. There is no set formula for determining the "right" reports and analytics for a particular company. No book explains every single possibility to consider in your analysis cycle.

What's required is putting the right kind of people in positions where BI is to play a role. Or the BI attitude must be spread by the company's leadership. BI is about a commitment to a rational approach to making decisions — and that approach must be supported at all levels of the organization, by IT executives and business executives.

## *So, Are You BI Curious?*

Would your organization benefit from a business intelligence solution? There is no automatic answer to that question, but nearly every company can see improvement from adding some rigor to the decision-making processes. The following list of questions you might ask about your organization could indicate whether a BI approach makes sense:

- ✓ Can you view sales data in more than one view simultaneously? For example, if you wanted to see quarterly sales data by sales manager, product line, and customer type, how long would it take to produce the report?
- ✓ Is there data locked in transactional systems about your customers that you'd like to see but can't because the system just isn't designed to view the data the way you want?
- ✓ When your company makes strategic decisions, are you relying on hard data before you proceed or is it coin-toss time? Do you base your actions around evidence of the past and verifiable conclusions about the future? Do you consider statistical correlations between causes and effects? Or is it a seat-of-the-pants maneuver?
- ✓ You know what items your customers buy the most, but do you know what items your customers buy in *pairs*?
- ✓ Do you know what your company does best? How do you know it? Is it a gut feeling or do you have metrics to back up your conclusions?

## Chapter 2

---

# Fitting BI with Other Technology Disciplines

---

### *In This Chapter*

- ▶ Walking hand in hand: BI and data warehousing
  - ▶ Connecting BI to the enterprise with ERP
  - ▶ Utilizing customer data with CRM systems
  - ▶ Using BI to plan for the future
  - ▶ Making e-commerce smarter through BI
- 

**I**n this section, we look at the most prominent technologies commonly associated with BI. Because these other classes of software are common in so many companies, it's important to understand how business intelligence is related to them. The associations — some casual, some arrangements of convenience — are of interest and importance to anyone considering a BI implementation.

These disciplines exist outside the immediate realm of BI — but in each case, business intelligence concepts and approaches have had a dramatic effect and helped the underlying technology round itself out into full form. The relationship between BI and each of these technologies is a two-way street. Each technology area has benefited from the BI process, and BI has grown and in response to the widespread adoption and evolution of these technologies — especially data warehousing, Customer Relationship Management, Point-of-Sale systems, and Enterprise Resource Planning.

## *Best Friends for Life: BI and Data Warehousing*

Maybe you remember the old Reese's Peanut Butter Cup commercials featuring the inevitable collision between the person carrying peanut butter and the person carrying chocolate. "You got chocolate in my peanut butter!" the

former would exclaim, followed by the other proclaiming “You got peanut butter on my chocolate!” After a moment of consternation they realized the wonder they had created by mixing those two essential substances of the universe together at last.

The collision of data-warehousing technologies with BI practices was a *Eureka!* moment for companies:

- ✓ Executives needed better access to the company’s day-to-day data so they could evaluate conditions more accurately and make better decisions.
- ✓ The IT department was developing protocols and systems to bring widely dispersed and variable databases under one roof in order to run companywide statistical analysis and basic reporting.

When the two concurrent goals came together it was a chocolaty-peanut butter delight. (From a business perspective, anyway.)

Like Batman and Robin, BI and data warehousing are inextricably linked. The product of the two technology areas is more beneficial to companies than the sum of their parts. While each discipline is important in its own right, together they enable businesses to go beyond organizing operational data. BI and data warehousing make a transcendent combination — a powerful competitive weapon that can actually guide the business in ways previously considered impossible.

## ***The data warehouse: no forklift required***

The whole purpose of a BI implementation is to turn operational data into meaningful knowledge. That means BI must be connected with an organization’s data to be effective. With data spilling out the doors and windows of any enterprise, the challenge is to put all the *necessary* data in one place, in one common format. Data warehouses are the perfect architecture to meet that challenge head on.

A *data warehouse* is a single logical (but not necessarily physical) repository for a company’s transactional or operational data. The data warehouse itself does not create data; it’s not a transactional system. Every byte of data inside the data warehouse has its origins elsewhere in the company.

So what data are we talking about then? Most enterprises produce data in a variety of different departments or domains; there might be transactional sales information coming directly in from a point-of-sale system (POS), customer data from a Customer Relationship Management System (CRM), and an endless variety of operational systems that help the run. The data dispersed throughout all these different applications is likely saved in a variety of formats, on a range of hardware — say, a dedicated storage network, a mainframe, a database server on the Web, or even on various desktops. It could be anywhere.



Data warehouses are different from standard transaction-based data-management systems. A data warehouse aggregates information about a single subject area — and management then uses that resource in one of two ways:

- ✓ to create focused reports on one aspect of the enterprise
- ✓ to query in order to gain insights on that subject

Both activities are read-only. That makes sense because typically no data is deleted from a data warehouse. Transactional systems, on the other hand, add, delete, and update the data they store.

### ***Turning “apples-to-celery” into “apples-to-apples”***

A data warehouse is a collection of data from different systems, focusing on one subject area. But because the data originates from a multitude of sources, it's going to be in different formats. Part of a data warehouse implementation involves manipulation — or transformation — of the data prior to storage so that it resides in a single common format.

Imagine you're merging phone lists from two different Excel spreadsheets. One lists names as “Smith, Jason E.” and the other spreadsheet lists names in the format “Jason E. Smith”. There are some names that appear on both lists, but some are unique to one list or the other.

After merging the two lists, you alphabetize them and look at a sample of the combined list:

---

Jacob Rogers	214-555-5406
Jacobs, Jeff Z.	972-555-9044
Jeff Z. Jacobs	972-555-9044
John A. Smith	214-743-0000
Johnson, Albert S.	817-342-4971

---

If you've merged the lists without transforming the data into a single format, the result is a unified — but confusing — list. First, how would you look someone up if you didn't know whether they are listed by their first or last name? Then there's the problems caused by duplicate entries. If one person is listed twice (once in each format), then you'll have problems if you need to update the person's information, to say nothing of the ambiguity in doing lookups. On top of that, you'll have trouble creating a simple summary report of this data; you know how many list entries there are, but how many unique *people* are there?

many organizations do. For example, many companies utilize data-warehousing technologies and approaches to create Operational Data Stores — ODSs (okay, some purists argue that data warehouses and ODSs are very different — but we can let them argue). Where DW and BI are focused largely on management reporting for executives, the same aggregation of data can also be extremely useful for mid-level managers who keep track of operations.

Imagine a manager who wants to keep an eye on operations at the call center. The key to making this happen is data-warehousing technology that does its work in this sequence:

1. Brings in external data from different sources.
2. Transforms the data into a common format.
3. Cleans the data for any incorrect or missing data.
4. Correlates the calls and call durations with operational and transactional information from other parts of the company.
5. Produces regular daily reports that show the correlation.



Data warehousing really pays off if it's a prelude to enabling a business intelligence solution. After the data is collected and the barriers between the islands of information are broken down, the next logical step is to build bridges between those islands that create meaningful corporate insights (yep — accurate, timely, material, and actionable).

## *ERP and BI: Taking the Enterprise to Warp Speed*

From the advent of business computers, up through the late 1980s and early 1990s, the systems that drove and supported the enterprise were designed — and run — mostly independently of each other. Even systems that would naturally fit together — say, finance and accounting or supply chain and inventory — were built and operated as separate entities. In the early 1990s, companies began to see computing power as a way to integrate vast and diverse transactional systems. As a result, Enterprise Resource Planning (ERP) systems were born.

## *From mainframe to client/server*

The computing power that originated most legacy software was centered on *mainframe computers* — gargantuan machines that existed in big rooms, or even took up entire floors of buildings. Their cousins, the minicomputers,

had a similar role as centralized points for all of a company's processing. In those days, the IT staff consisted of as many electrical engineers as it did computer programmers — because the mainframes and minis were at least as much electromechanical machines as they were computers — and sometimes reprogramming meant rewiring.

By the late 1980s, *microcomputers* (which we know now as *personal computers*) were getting small and powerful enough to place on workers' desktops, bringing about the rise of the *client/server* model. That led to pulling tasks away from the legacy systems and pushing them to workers' desktops. It also meant great advances in networking protocols and practices, linking people and data together for the first time. This had some fantastic advantages in terms of individual productivity, flexibility, and scalability.



The term *legacy application* most commonly refers to older, mainframe-oriented data-processing software. IT managers who cut their teeth on the newer client/server architecture came to view older mainframe applications as dinosaurs, an inherited burden that had to be upgraded or replaced ASAP. But today, *legacy* has become a catchall pejorative that refers to *any* last-generation technology.

ERP came about as companies saw the need to integrate the core business computing systems to fit with their new client/server architecture. The battle cry arose: mainframe computing, with its magnetic tapes, punch cards, and outrageous electric bills, was dead. Why do data processing in one central place, they asked, when the work can be done on computers distributed throughout the business?

## *The great migration*

The advantages of running ERP systems were clear. Workers could produce and consume data as never before. The old centralized data processing applications could now become more interactive, and customized to fit the company's needs. And yet the client/server architecture still provided centralized storage of information, which meant ERP applications could run and have everyone in a company looking at the same data.

SAP was first on the scene, but others quickly followed. PeopleSoft, Baan, Oracle, Lawson, and JD Edwards were all pioneers in client/server ERP. Salesmen from these companies fanned out across the country, into IT departments, all with the same promise on their lips: "You can do away with your big expensive mainframe computer systems." And the IT departments were listening.

## SAP slurps up the ERP market

The company that is considered the founder of Enterprise Resource Planning software is the German firm SAP, founded in 1971. In 1973 they introduced R/1, an application that did something quite revolutionary for the day: It handled real-time processing of finance and accounting business functions. (In fact, the R stood for *real-time*). R/1 became R/2 in the early 1980s, which was the first true ERP suite. R/2 expanded its finance and accounting functions along with

human resources and operations packages. For the first time, multiple departments (and physical locations) had a single view of company data. And SAP isn't just a pioneer from the old days. The company continues to be the market leader in ERP — having released R/3 in the early 1990s and building on the product from there — developing over 30,000 clients all around the world.

## Like it's 1999: the Y2K catalyst

In the mid-1990s, computer nerds everywhere became aware of a problem brewing in the chips of companies everywhere around the world. No, the Master Control Program from *Tron* wasn't about to take over the world. It was much worse . . . .

### *The famous Y2K Bug*

The *legacy systems* (old data-processing software that was still running on corporate mainframes and minicomputers) weren't designed to understand that the year after 1999 was 2000, not 1900. That's because these systems were only capable of tracking years in terms of two digits, so 1971 was represented as 71, 1999 as 99 — and when 99 turned to 00 in all those computers, would disastrous amounts of data disappear? Nobody knew.

When the legacy systems were developed in the 1960s (and 1970s in some cases), the new millennium seemed so far in the future that nobody thought the systems they were building would still be relevant and operating on December 31, 1999. Surprise: Much of the software written back then would become the basis for future generations of code. Programs would be reused, repurposed, and generally expanded upon with each successive release. There, lurking in the heart of every system that used that code — at the core of thousands of businesses across the world — was a simple and powerful bug that could bring factories, plants, and networks to a halt.

### *ERP saves the day*

One solution to the Y2K problem was to have programmers dig through the old code and fix it. But this was time-consuming, expensive, and not guaranteed to work.

ERP companies offered a more complete solution to the problem: By completely replacing legacy systems with a unified set of ERP applications, companies could remove all doubt about Y2K. Not only that, but the new systems offered upgraded capabilities over the legacy systems.

The sales pitch (essentially “upgrade now or else”) worked. The Y2K problem was a boon for ERP companies as organizations installed products from SAP, PeopleSoft, and the others at a record pace. Indeed, 1996 through 1998 proved record years for ERP vendors. (In case you’re wondering, by 1999 sales had dropped off because companies had run out of time to begin new implementations.)

## *Cold war reporting*

Legacy systems were designed for data processing — crunching numbers. As such, the reporting capabilities were minimal. Summoning information from data storage beyond the standard basic diagnostic and status reports produced after batch processes were complete required a Herculean effort by analysts and programmers.

In the early days of ERP, the focus was on merely replicating the core functionality of the legacy systems, so ERP software was relatively light on reporting capabilities. The systems may have been unified, but there usually was still a need to call in armies of programmers to hard-code custom reports against the transactional databases — just like before.

## *ERP leads to the foundations of BI*

The weaknesses of hard-coding reports was apparent — as were the problems associated with trying to use data from live transactional and operational systems in queries and reports. These challenges led ERP companies to begin incorporating some basic data-warehousing approaches into the new unified suites of applications — in conjunction with some advanced reporting capabilities.

Now companies could truly have their cake and eat it too with their ERP systems:

- ✓ Their legacy systems all spoke the same language.
- ✓ The data warehouse aggregated the data.
- ✓ The new reporting tools made it easy to put the company’s data under a microscope.

began to put greater demands on it to do more. Rather than just keep track of yesterday, CRM customers wanted the software to participate in the process — and help predict what customers were going to do.

Companies began to see the potential for expanding CRM's role as they looked at all their contact points with customers. Call centers were foremost among these contact points; there hundreds of customer-service representatives would work phone banks while sitting in front of the custom-built applications they used to perform order entry or trouble-ticket functions on behalf of customers.

## ***Customer decisions***

In the late 1990s, data-crunching capabilities were on the rise in other parts of the company, it was only natural that CRM systems would become more involved in decision-support processes.

E-commerce was also exploding in the late 1990s; the competitive fever required companies to wring every dollar they could from their online markets. That's when companies such as e.piphany came into being by merging traditional core CRM functions with BI-like analytical features and reporting capabilities.

### ***Campaign management and more***

Marketing was also transformed. Campaign management companies such as e.piphany guided their clients' marketing practices to make them more *customer-centric*. Yes, of course that's a silly tautological buzzword — customer-centric marketing . . . as if there's any other kind. But there is a germ of truth to it. Products from this new generation of CRM companies allowed analysis and integration of customer data in a way that companies had never done before.

That gave companies a new capability to create precision-guided campaigns, to tweak their sales cycles to fit perfectly with the kinds of customers they attracted. Companies could suddenly measure the effectiveness of their sales force in ways never before imagined, and it spawned entire new marketing practices like customer loyalty management, churn management (a.k.a. harassing existing customers to buy more), and customer reacquisition processes to help bring straying former customers back into the fold.

### ***CRM with a scoop of BI on top***

Now that CRM had gone beyond merely keeping track of what a sales force was doing — now that it was more than a fancy rolodex with customer names stored within — the applications sprouted wings and began delivering customer-focused analysis and reporting that created a new science of working with customers. Some of the new features included

As retailers stumbled through e-commerce's growing pains, they had several key tasks to accomplish: They had to develop the software itself (catalogs, shopping carts, credit card processing) plus develop data-capture and reporting systems to match the transaction processing. As was the case with CRM and ERP systems, these functions had to be built from scratch, hard-coded by a mix of Web and traditional developers. At first the back-end analysis systems added little intelligence to the e-commerce process itself, it was little more than *ex post facto* reporting and analysis.

## ***E-commerce gets smart***

Amazon founder Jeffrey Bezos and his apparent fascination with analytics were largely responsible for pushing BI into the e-commerce realm — and driving his company to billion-dollar heights in the process. Early on, Bezos operated a company that lived, ate, and breathed data. Managers pulled metrics and reporting data from every conceivable piece of the Amazon operation. It started with a motivation to make the fulfillment and inventory systems as lean and efficient as possible — something Bezos knew could only be achieved by using hard data to drive management decisions. Then Bezos applied the same analysis-heavy mindset to the storefront too, where he tracked every move customers made — and had the Web application respond to those moves.

The results of Amazon's BI culture manifest themselves today in the company's marketplace hegemony as well as in the user features you encounter when you shop online. When you log in, you see the last products you looked at, along with products judged to fit your tastes (according to your browsing and buying history). When you add books to your shopping cart, the system performs real-time analysis to recommend other books to you. BI actually helps shape customer behavior in real time.

## ***Real-time business intelligence***

Amazon's ability to influence customers is only possible because it collects a mountain of customer data. As you shop, sophisticated analytics are running in the background — comparing your habits and online activities with those of millions of customers who came before you. This customer-facing system can then react to you in real time (the industry calls it *shopping time*) and present you with options that make you more likely to spend more, return again and again, and be happy with the experience.

That instantaneous reaction — BI capabilities shaping a Web site's behavior on the fly — represents a level of complexity and utility that isn't commonly seen in the other technology disciplines we've discussed in this chapter. ERP, CRM, and planning systems are most useful for looking at *past* data and doing one-time analysis to guide decision-making. But e-commerce brought BI into the present tense.

## *The Finance Function and BI*

One more area of software functionality has been touched by business intelligence: financial reporting and analysis. The finance departments of companies of all shapes and sizes go through the process of assembling budgets, corporate planning initiatives, and performance forecasts. BI can help out there in unprecedented ways.

The budgeting and planning process for organizations has always been intensely manual — low-level analysts and staff members would crunch numbers and create individual spreadsheets that then had to be merged and summarized before becoming part of the next level. Team budgets would roll up into departmental budgets, from there up into divisional budgets, and eventually up into the overall corporate budget.

This process left very little room for analysis. Any changes to the planning process would have to be cascaded up and down throughout the company to really understand its full effects — a process that's simply not feasible in most companies.

As with ERP, CRM, and e-commerce, business intelligence found fertile soil in the global finance functions. CFO's were desperate to move beyond the pencil-and-paper processes and Excel spreadsheets that had dominated the area for so long.

Business intelligence technology allows planners to perform what-if analyses, run budgets through predictive and profitability analyses, and create scorecards and dashboards to aid in corporate performance- management practices . . . for openers. BI not only speeds up these processes, it also gives the finance department far more confidence in the numbers themselves.

## Chapter 3

# Meeting the BI Challenge

### *In This Chapter*

- Identifying your BI needs
- Looking at the BI continuums
- Using best and worst practices
- Avoiding vendor hype

**J**ust about everybody agrees that having timely, accurate, high-value, and actionable insights available before making critical business decisions would be extremely helpful. What marketing executive *wouldn't* want a report that clearly shows the optimum mix of products to send to the marketplace as a package? What V.P. of Sales *wouldn't* like reliable figures on which territories and accounts are the most profitable? But wanting something doesn't make it a reality.

While good business intelligence is within virtually any company's grasp, many obstacles can get in the way. There are technology landmines, project hurdles, and even political challenges. As you prepare for a BI implementation, you need to be ready to answer some tough questions about how your company operates. You have to make some decisions about what exactly you want out of your BI solution. And you should brush up on your diplomatic skills to lay the groundwork for unifying your team behind a common goal.

This chapter is about identifying all the things that can go wrong with BI. If you know in advance which problems lie in wait for you, they're much easier to solve (or avoid altogether). If you charge ahead without considering what can go wrong, you'll join the ranks of companies whose BI implementations either never got off the ground or foundered once they were launched.

## *What's Your Problem?*

A typical business intelligence solution has many moving parts — including an array of software and hardware that must work together in concert. With BI's heavy reliance on IT, it's no surprise that many companies squander the

bulk of their planning process on technology. This tech focus is a misconception that will get you into trouble.



Hardware and software selection is not actually the most difficult part of a BI implementation. A company that focuses on choosing server vendors, designing architectures, and the like is missing the real problem: identifying accurately what the business actually needs.

The real challenge of BI is coming up with a workable answer to the question “What’s our problem?” For business intelligence solutions to go to work for you delivering important business insights, your organization must determine the purpose of the implementation. Okay, that may sound all pie-in-the-sky and a little bit *meta*, but you do need to ask some preliminary questions to identify the kinds of *business* questions you want BI to answer.

Some of these questions are obvious, some require in-depth research, some might bring a range of responses depending on whom you ask within your company, and some may have no single answer — just an educated guess will have to do. Here’s a sampling of those questions:



- ✓ What data is currently available to be measured and analyzed?
- ✓ What measurements can we monitor that indicate success in one or more areas of the business?  
These are the *key performance indicators* (KPIs); we talk about them more in Chapter 6.
- ✓ When do we need the answers? Do we need them all at once?
- ✓ How will we take action if certain insights demand it?
- ✓ How prepared is the company culture to effect change once we get our answers?

And there are more of these — many more — to answer before you start thinking about technology. Some range from mundane project and logistics questions, but many are darn near philosophical questions that cut straight to the heart of the way your organization is run, and approaches change. Taken together, answering these questions shines light on the entire purpose of your business intelligence implementation. And best of all, you’ve made good progress toward BI success without spending a dime on software licenses or consultants’ time (yet).

## ***What can go wrong***

If you move ahead with a BI *solution* but fail to properly or completely identify the problem you want it to solve, you don’t get much benefit from BI. In

fact, a BI implementation can be a disruptive force to your organization in many ways. Consider the following areas of impact.

### ***Cost***

If you had an unlimited budget you could try everything and keep only what works. But BI can be an expensive proposition — and it doesn't stop with new software licenses or consultant bills. There's always a need for extra hardware and infrastructure. Then you have to factor in maintenance costs, training costs, and all sorts of hidden expenses (such as a temporary decline in worker productivity as they adapt to a new paradigm, training classes for users and project team members, opportunity costs, and so on).



BI is not for the faint of heart, nor is it for the faint of wallet.

### ***Time***

Sure time is money, but sometimes time is just . . . well . . . time. Working through a fruitless BI implementation means you aren't doing something else that could be useful to the company. Waiting on a BI implementation to bake can cause delays in tackling strategic problems. The resources dedicated to the task could be repurposed to other tasks with immediate payoffs like getting a product ready for market or improving your internal processes.

### ***Credibility***

Not all high-level executives are convinced that BI is more than just an empty buzzword. If one of the doubters sees your project fail, you'll just confirm their pre-conceived notions. Worst of all, it makes it that much harder to gain support the next time around. And it's not just about the corner-office folks; a good BI implementation depends on people at *all* levels making a commitment to the process. Skepticism is a self-fulfilling prophecy, so you should take steps to ensure you get it right the first time.

### ***Bad advice***

The worst consequence of all is that you may think you're getting what you need from your BI solution, only to find out the analysis has produced recommendations that lead in the direction precisely opposite to success.



Most BI wounds are self-inflicted. When BI projects go wrong, it's not because software breaks or consultant teams lie. It's because companies either don't do adequate preparation or don't think through their goals and capabilities well enough (or both). And with this kind of self-inflicted wound, you don't get out of combat. You're back in your office on Monday morning with a bandage on your toe and an ice pack on your forehead trying to salvage what you can of your disastrous implementation.