

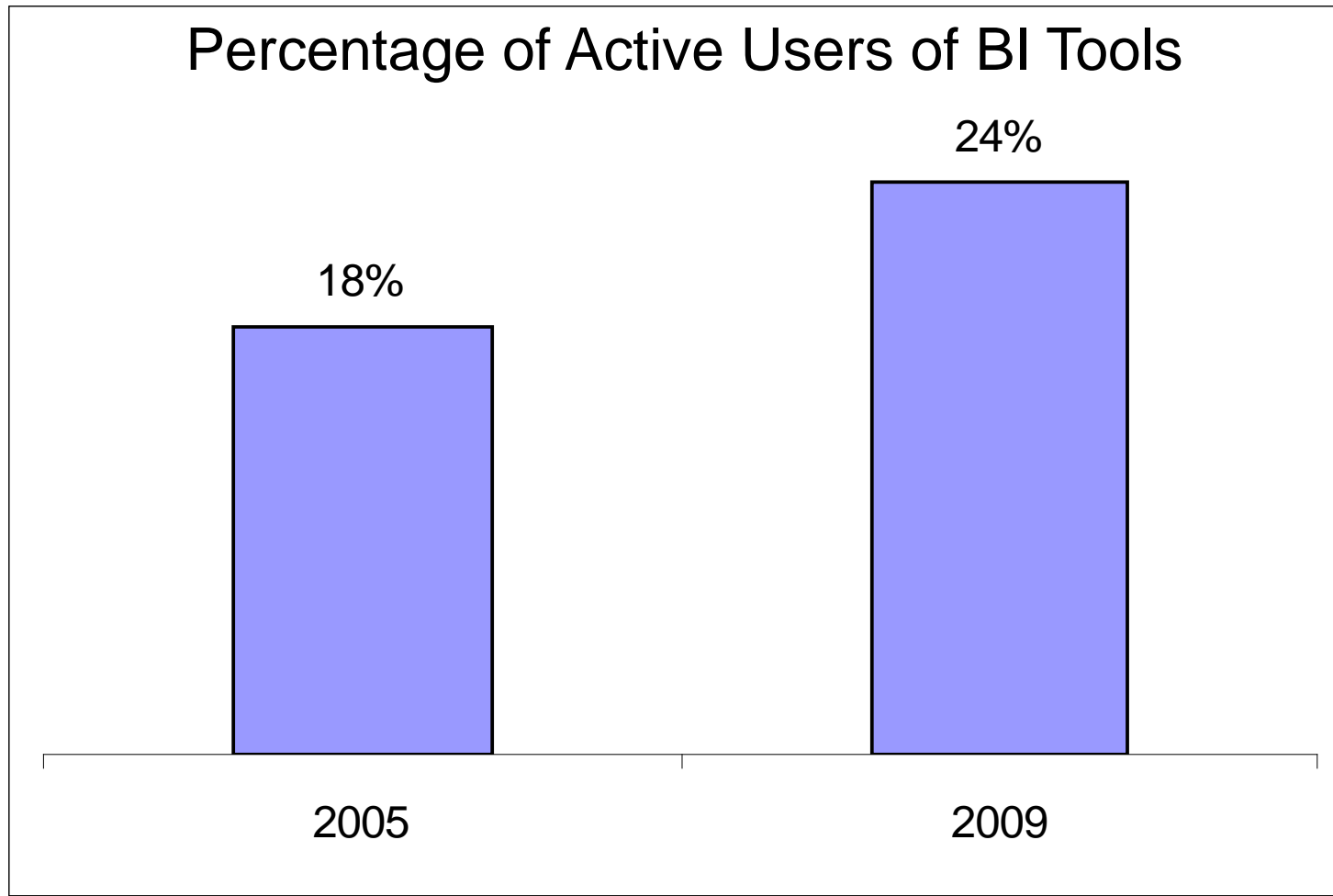
BI Market Trends: Driving Success Through Analysis and Action

Wayne Eckerson
Director, TDWI Research
The Data Warehousing Institute

TDWI RESEARCH

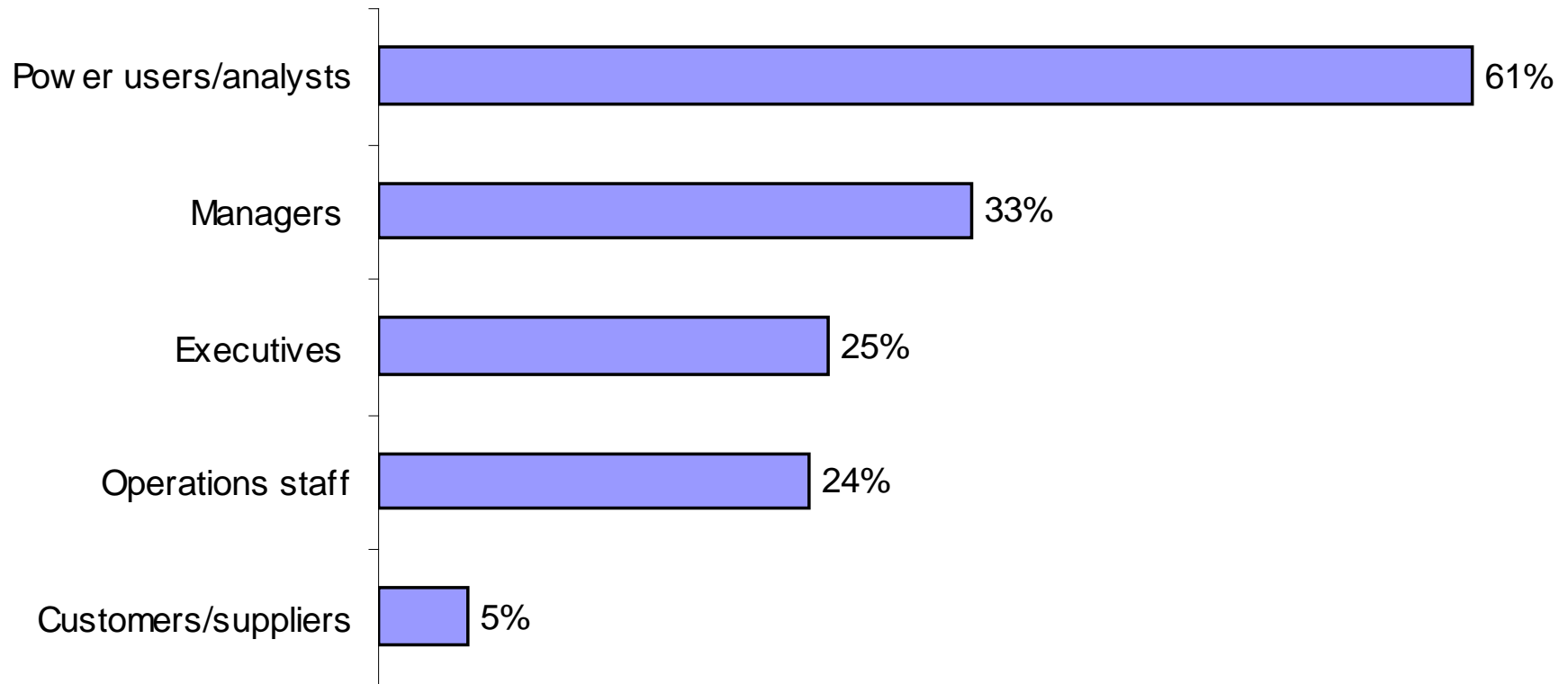


BI – Key Performance Indicator



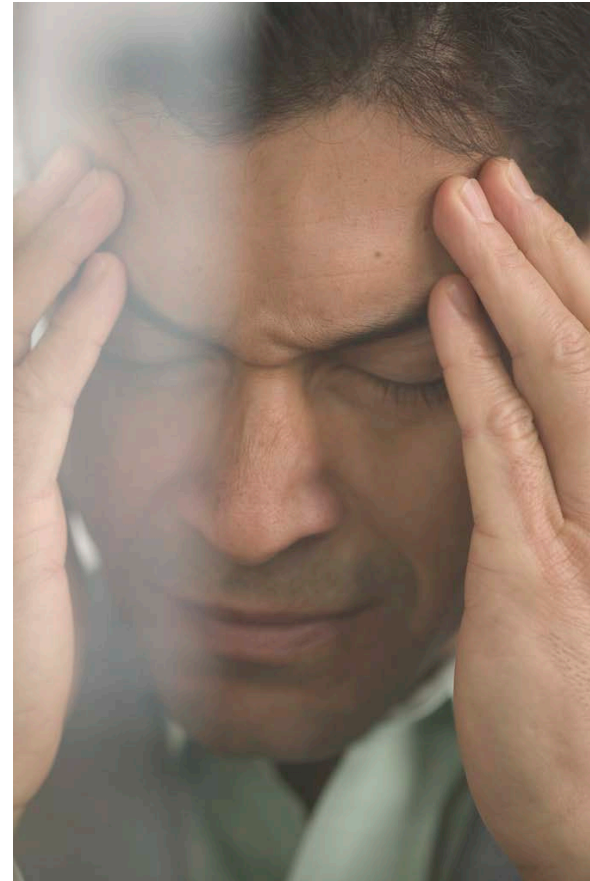
Closer Look

Percentage of Active Users of BI Tools - 2009



Business Perspective of BI

- Too slow
- Too slow to deliver
- Too expensive
- Too hard to use
- Not flexible enough
- Too many tools
- IT is a bottleneck

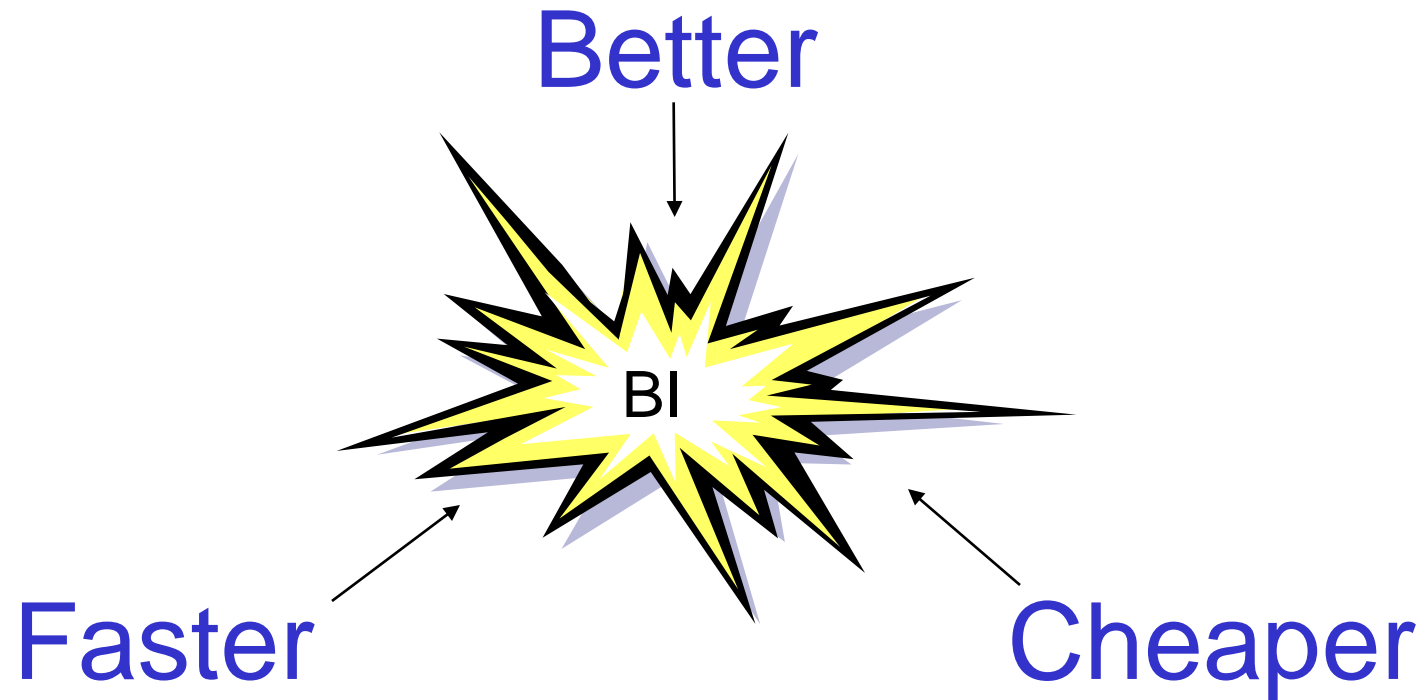


The Future of BI



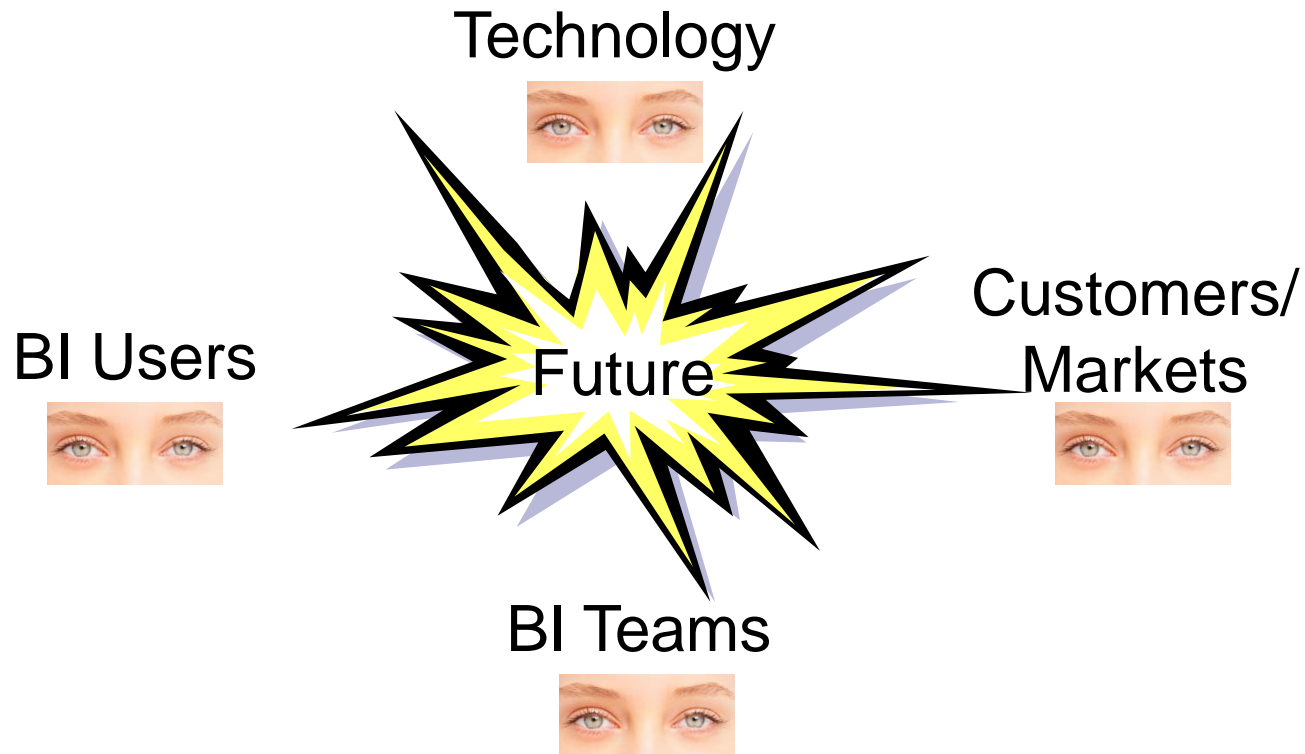
- Fast queries
- Quick to deploy
- Affordable
- Easy to use
- Interactive and visual
- Integrated
- Business-IT are partners

In the future, BI will be:



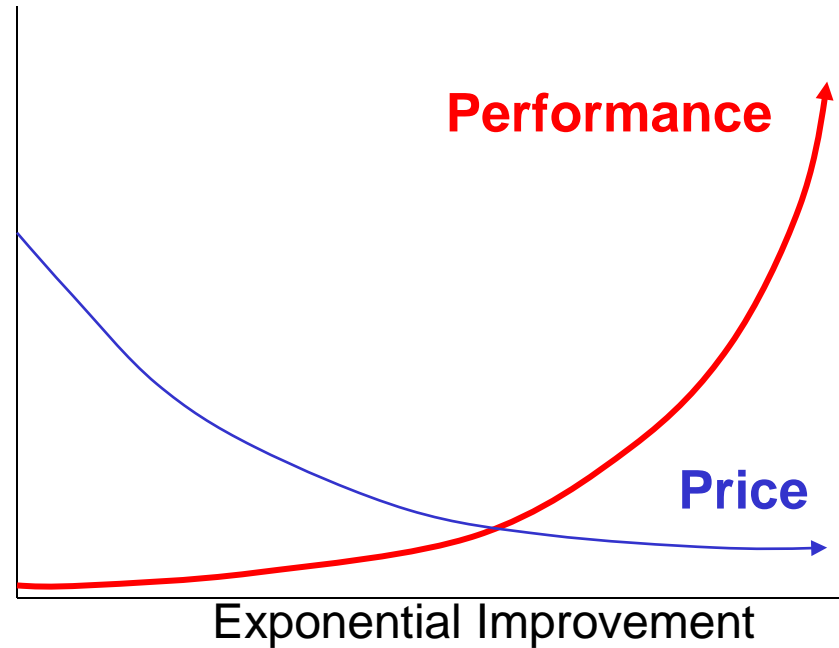
Hence, more pervasive!

The game is changing.... Fast!



Technology – Computer infrastructure

- Disk storage
- Memory (RAM)
- CPU



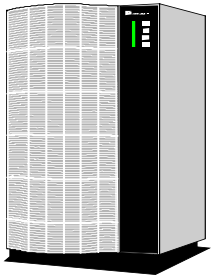
Evolution of Disk Capacity & Pricing

Year	Size	Price	\$ / MB
1980	26MB	\$5000	\$193
1989	40MB	\$1199	\$36
1999	10.2GB	\$299	3.37¢
2004	250GB	\$250	.001¢

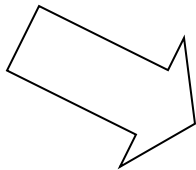


Impact on DW

1993 – Mark's DW for a Pharmacy Chain



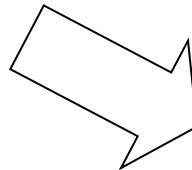
10 Pentium CPUs
2 GB RAM
1 TB disk
\$1.6 million



2009 - Mark's Desktop



4 core CPU
6 GB RAM
750 GB disk
\$600



2015 –DW on a phone?

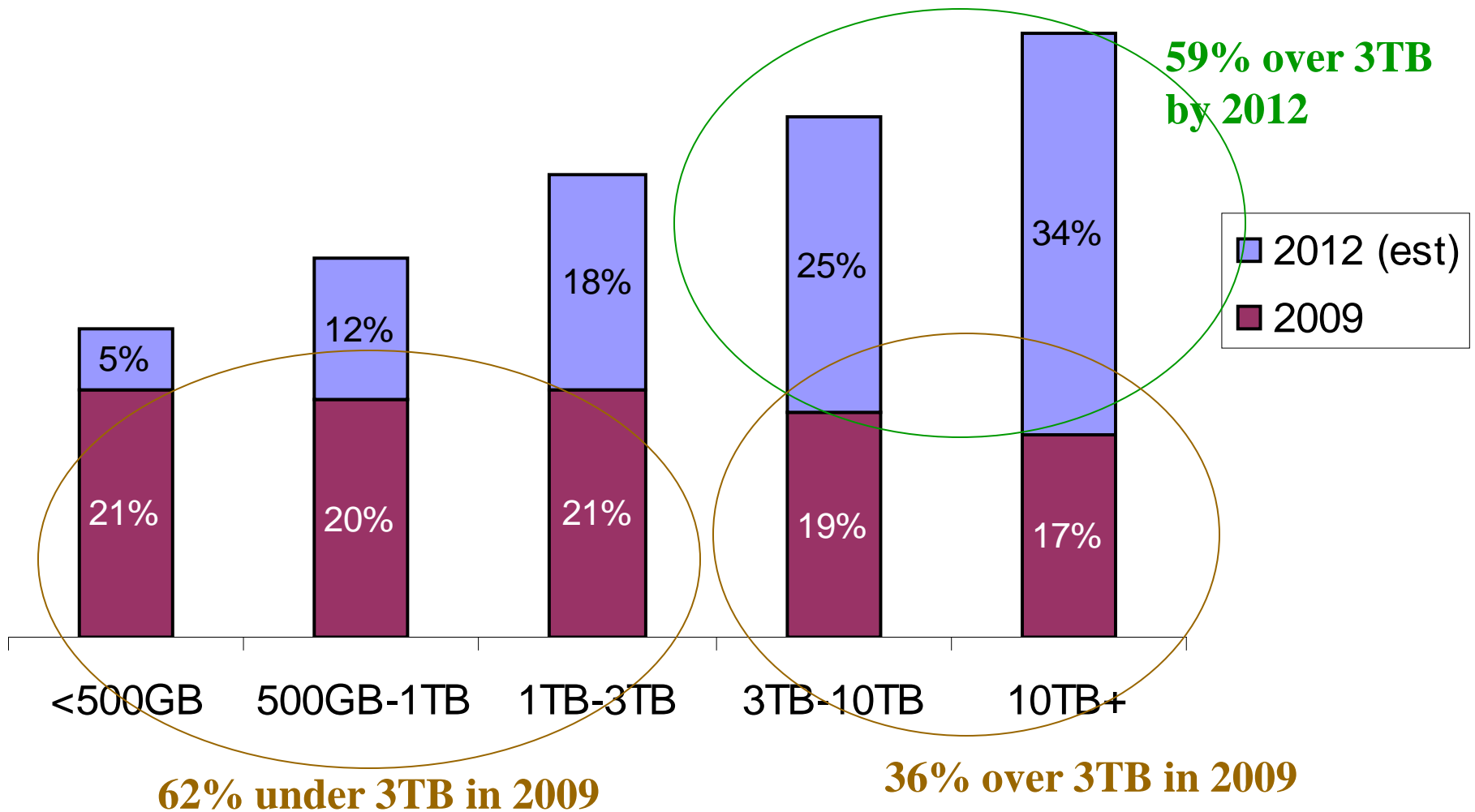


1TB Flash drive?
\$60/month



Mark Madsen
President, Third Nature

Projected DW data volumes



Based on 417 respondents, TDWI Research, 2009.

2012+ - Petabyte Data Warehouses

“Build it and they will come.”



- Transaction details
 - *Call detail records*
 - *Point of sale*
 - *Web clicks*
 - *Claims*
- Instrumentation
 - *Sensors*
 - *Smart Meters*
 - *Devices calling home*
 - *GPS signals*
- Unstructured data
 - *Video, audio, images, documents, etc.*
 - *Social media content and linkages*

Deep Analytics – Patterns and Relationships

Analytical techniques

Business Analysts

- Data profiling
- Sequential pattern analysis
- Time-series
- Bayesian analytics
- Regression
- Segmentation

Statisticians

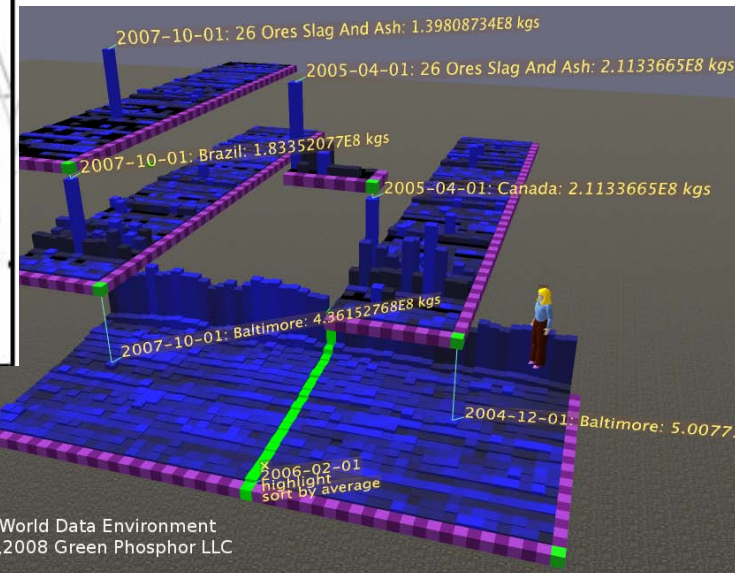
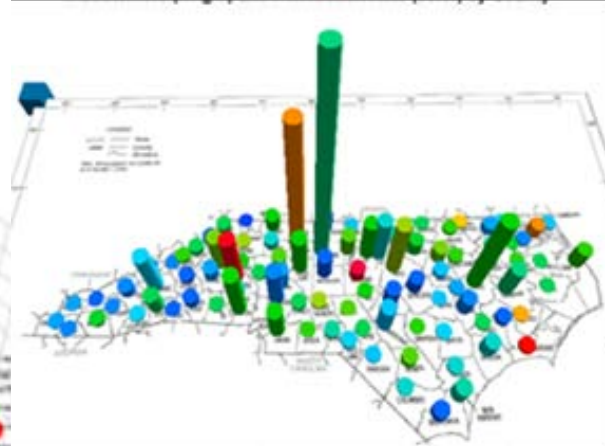
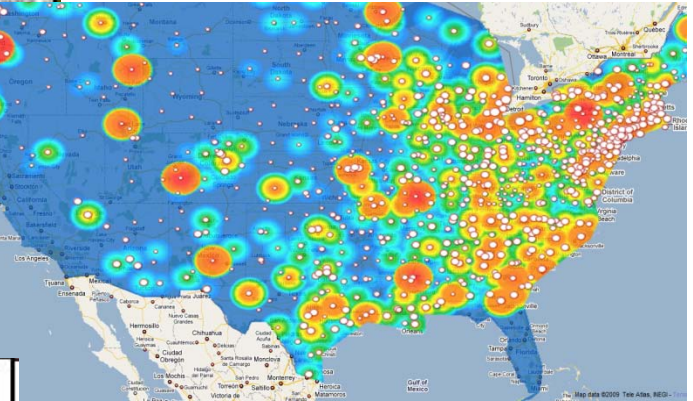
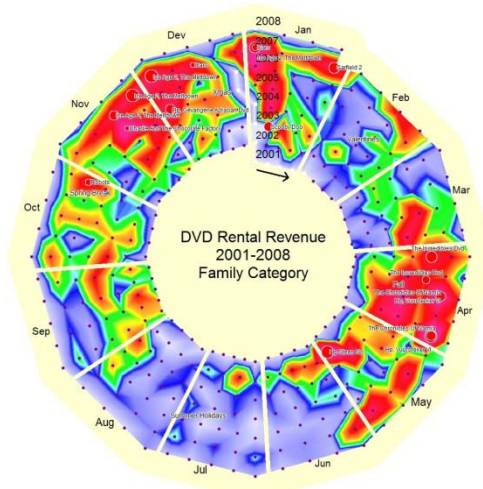
- Classification
- Clustering
- Decision trees
- Association analysis
- Neural nets
- Simulation
- Optimization

- Optimize the present:
 - “How design store layouts to maximize profits?”
 - “What price maximizes profits without losing customers?”
- Predict the future:
 - “When will this device suffer a catastrophic failure?”
 - “Which products will this Web visitor buy based on past?”

\$\$\$

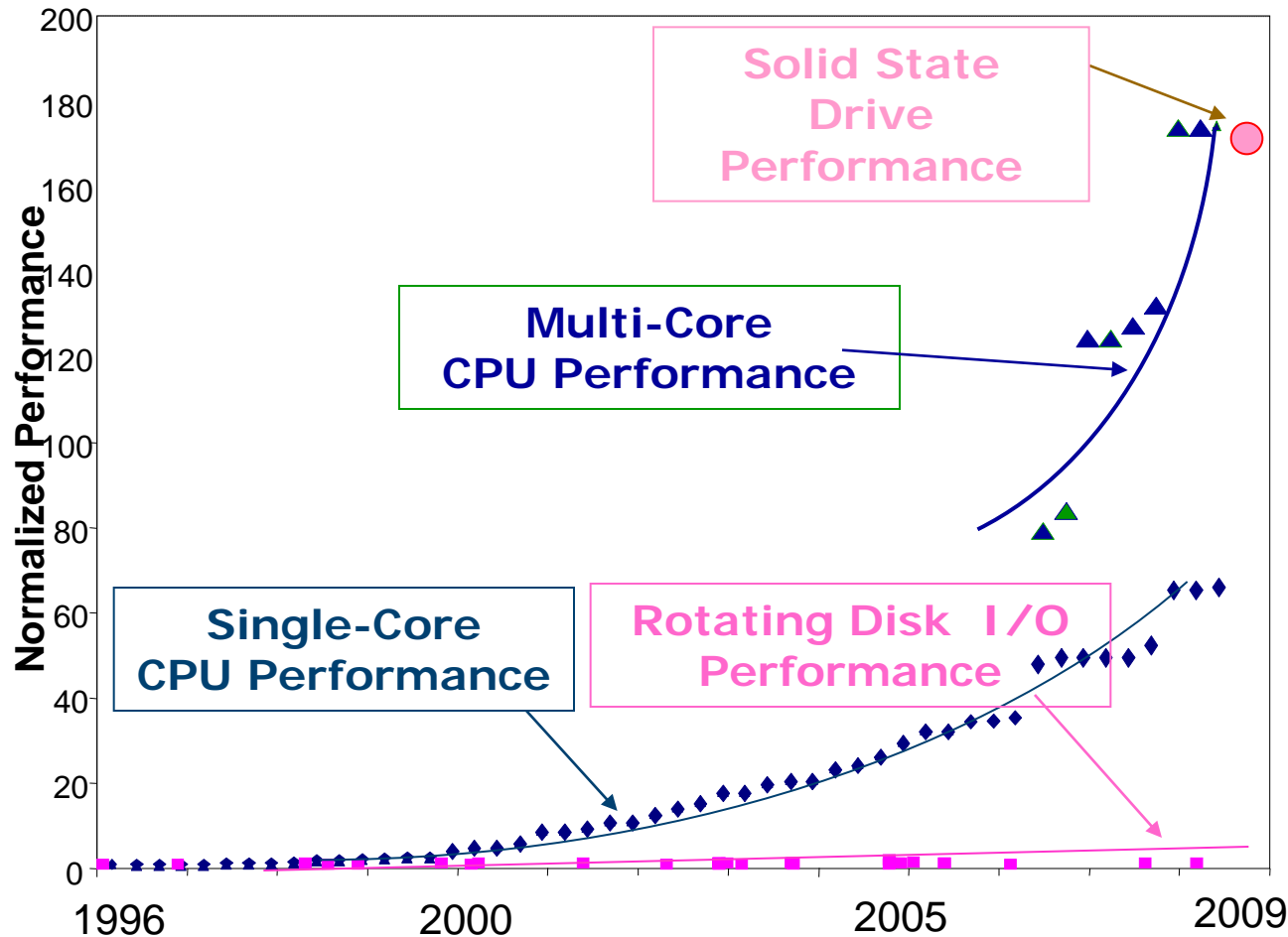
\$\$\$

Advanced Visualization- Spot outliers



Courtesy Advizor Solutions, BIS2, and Green Phosphor

Bottleneck: Disk Performance



Traditional Techniques

- Indexes
- Summary tables
- Bigger hardware

Source: Intel; Slide courtesy of Teradata

Memory (RAM)

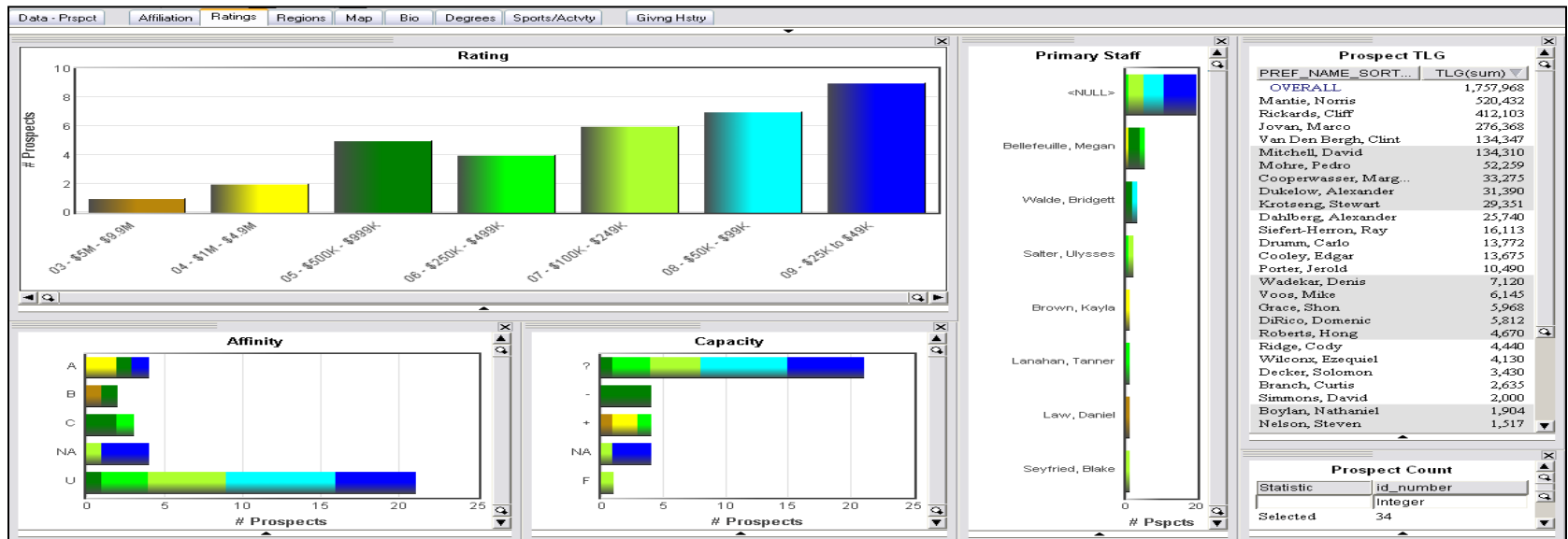
- Price-Performance
 - 1985: \$350 for 512KB of RAM
 - 2003: \$59 for 512MB of RAM
 - *1,000x more memory for 1/6th the cost*
- 64-bit operating systems
 - 32-bit: Hold 4GB of data in memory
 - 64-bit: Hold 16 exabytes in memory
- Database compression: 10% to 60%



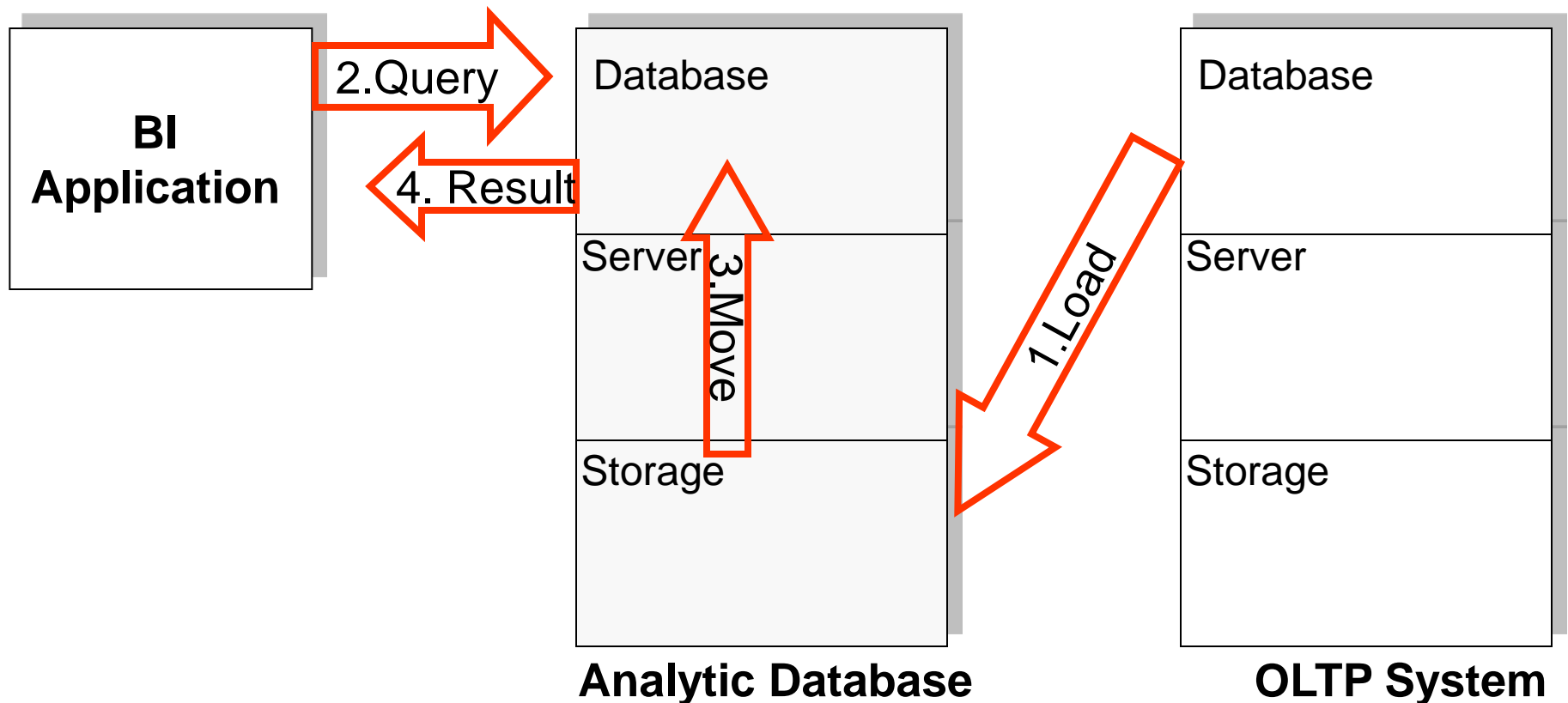
*64-bit OS w/ 16GB RAM & compression → 50 million rows
STORE A DATA MART OR DW IN MEMORY!*

In-memory analytics

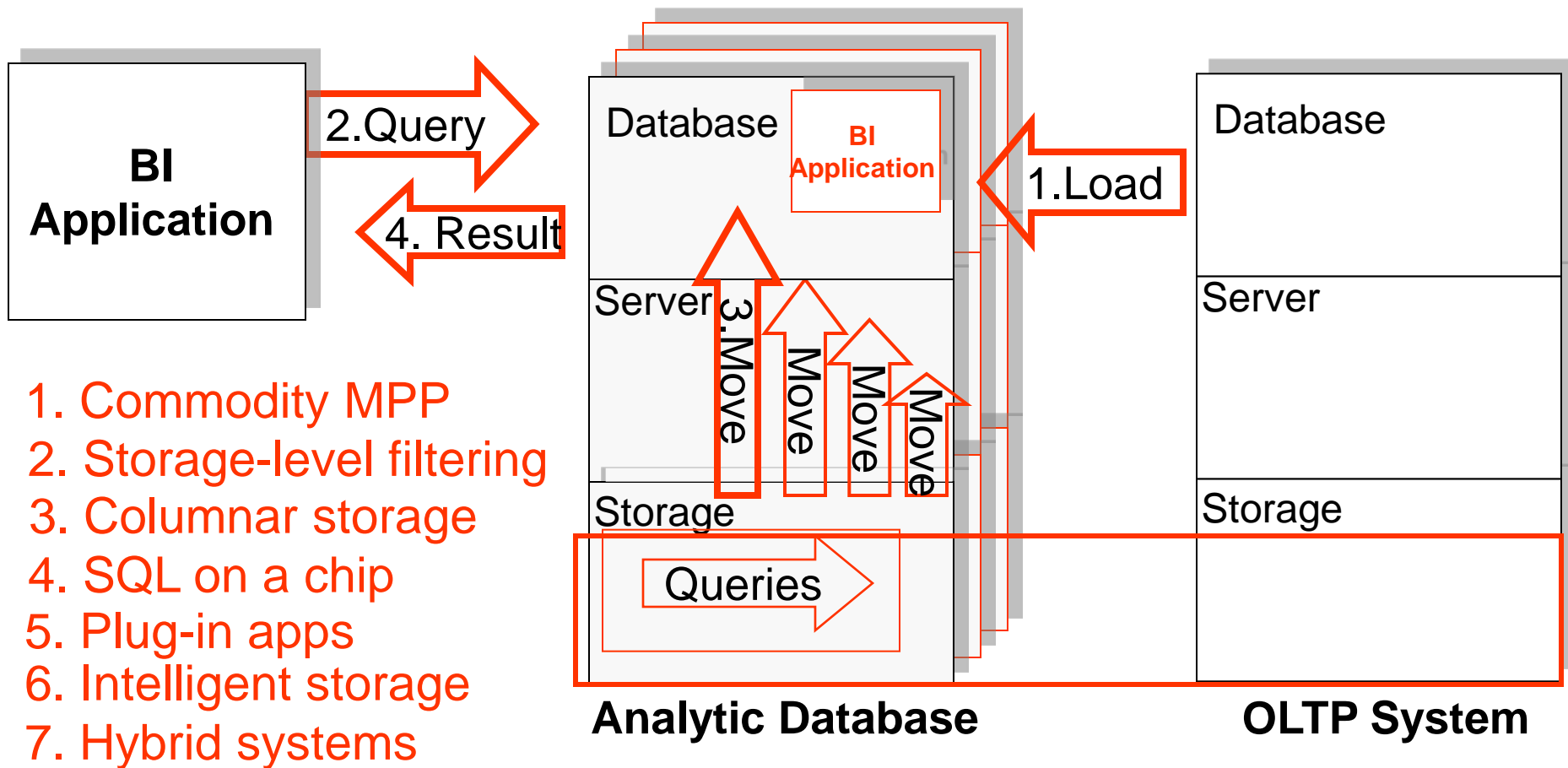
- Visual Discovery tools
 - QlikTech, Spotfire, Advizor, Tableau, etc.
 - “Speed of thought” visual analysis
 - Less than \$50k for 25 concurrent users



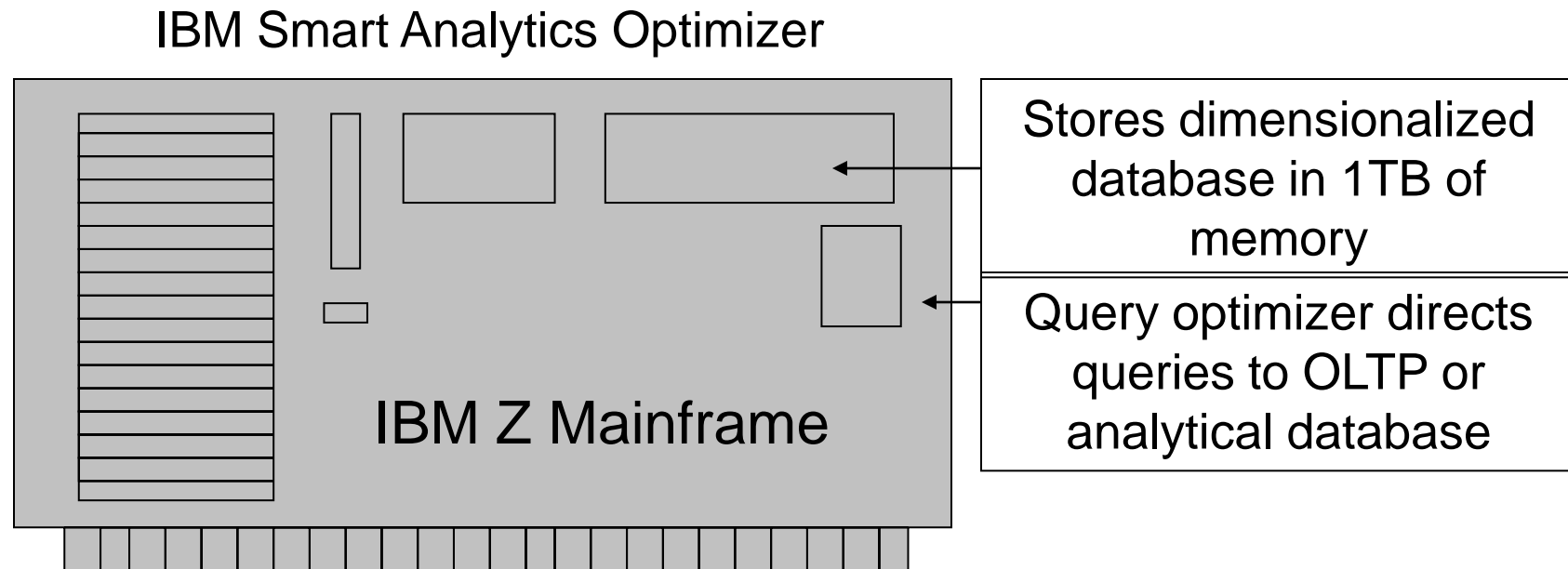
Database Bottlenecks



Optimizing database performance



Hybrid OLTP/DW System – Full circle!



Ships Q4, 2009

HW and SW Convergence

Operational Systems

- Optimized for transactions
 - Automate processes
- Structure the business
- Designed for efficiency
 - Rarely change

Analytical Systems

- Optimized for queries
 - Answer questions
- Adapt to the business
- Designed for effectiveness
 - Always change

Operational systems become more analytical

Analytical systems become more operational

The Perfect Storm

BIG DATA
+
DEEP ANALYTICS
+
REAL-TIME DATA

High Performance Analytic Databases

Incumbents

Teradata
Oracle Exadata
IBM InfoSphere
Kognitio

MPP Challengers

Greenplum
Aster Data
HP NeoView
ParAccel →

Columnar

Sybase
Vertica
InfoBright
Kickfire

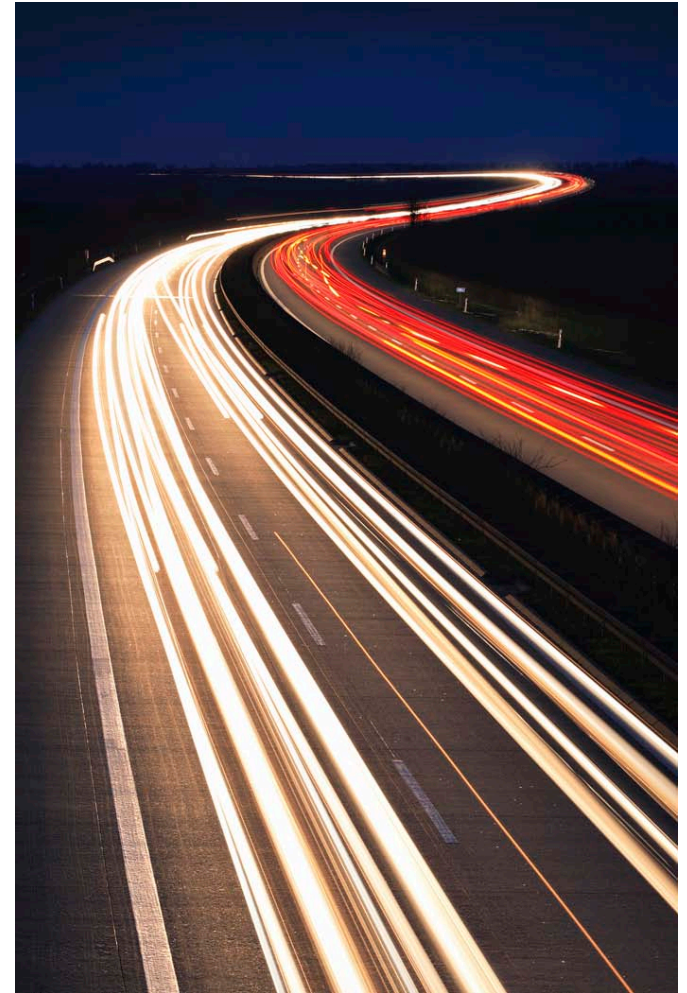
Event-Driven

Streambase
IBM Streams
Aleri/Coral8
Altosoft - Tibco

Game Changing Technology

“Queries that used to take a half an hour are now taking less than a minute....”

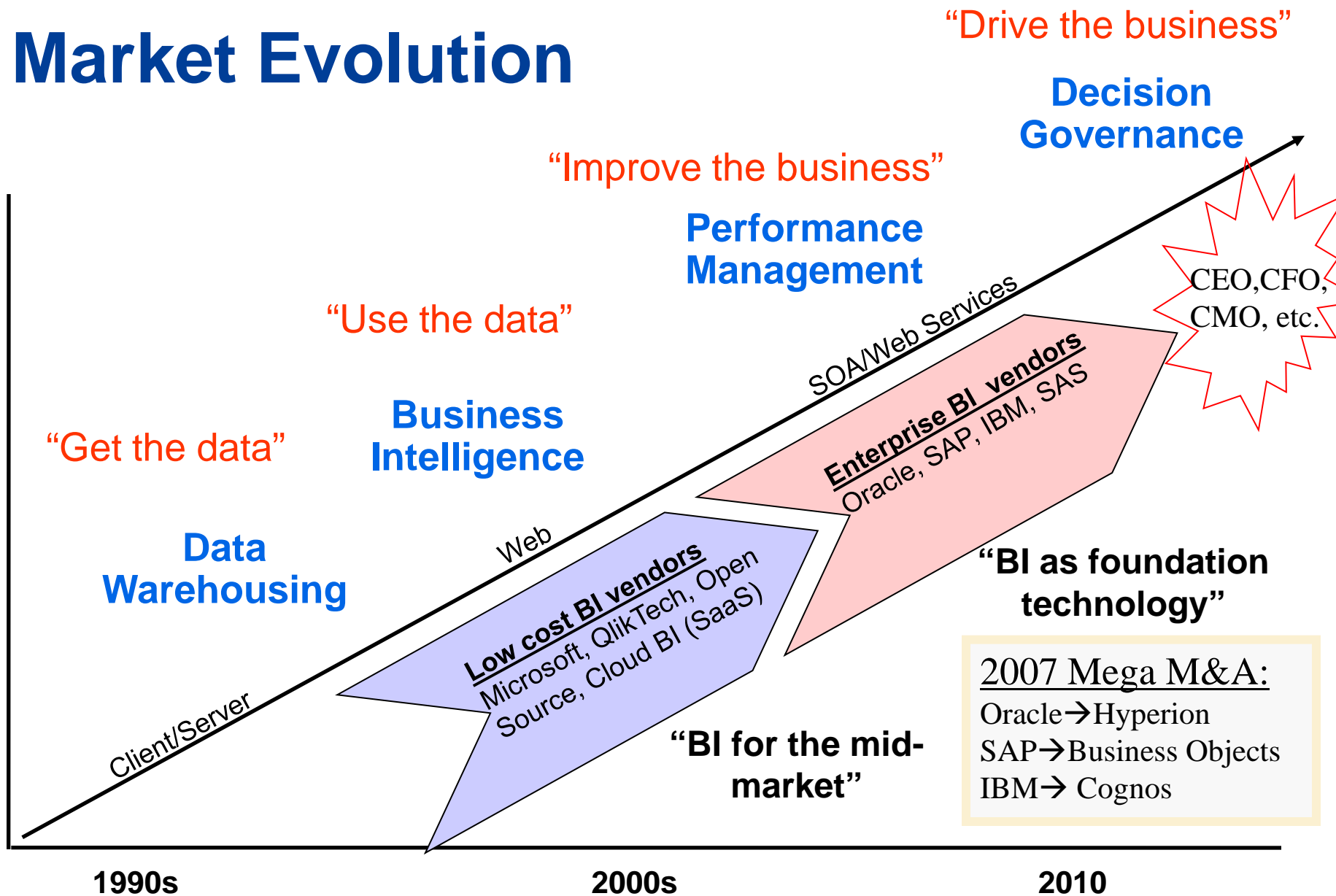
- Grant Salmon, CEO, LGR
Telecommunications



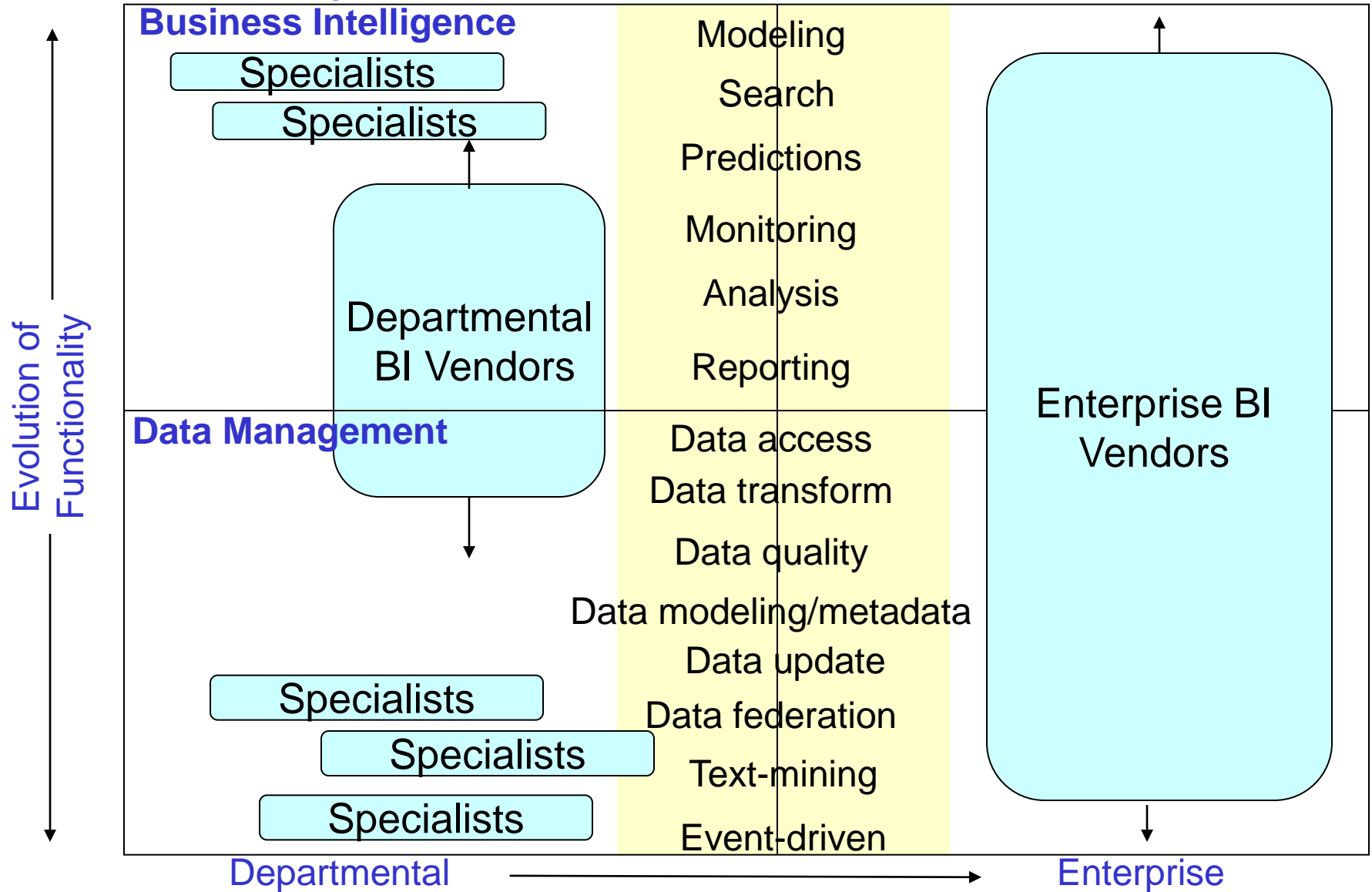
Impact on the bottom line

- **Sales:** Calculate the profitability of millions of individual customers DAILY. \$\$
- **Web:** Track navigation path of every Web visitor to your site DAILY. \$\$
- **Security:** Identify fraudulent activity for thousands of transactions in REAL TIME. \$\$
- **Marketing:** Provide service reps a 360-degree of customer activity in NEAR REAL-TIME. \$\$
- **Marketing:** Drive personalized offers for hundreds of customers via call centers & Web in REAL TIME. \$\$
- **Banking:** Calculate global risk exposure HOURLY. \$\$

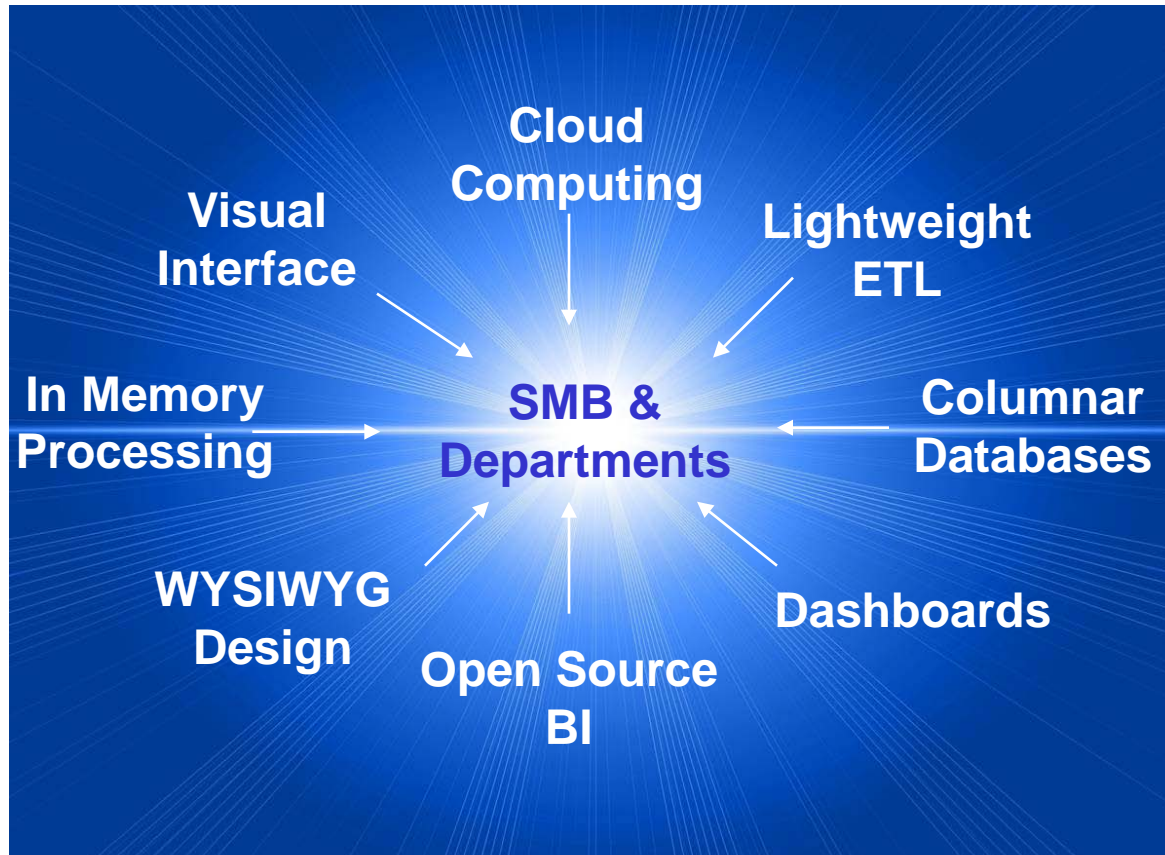
Market Evolution



Market Dynamics



Low-cost BI



Vendors – QlikTech, Microsoft, Tableau, Spotfire, Advizor, PivotLink, Birst, Corda, Visual Mining, InetSoft, eThority, Lyzasoft, MyDials, Autometrics, XLCubed, etc.

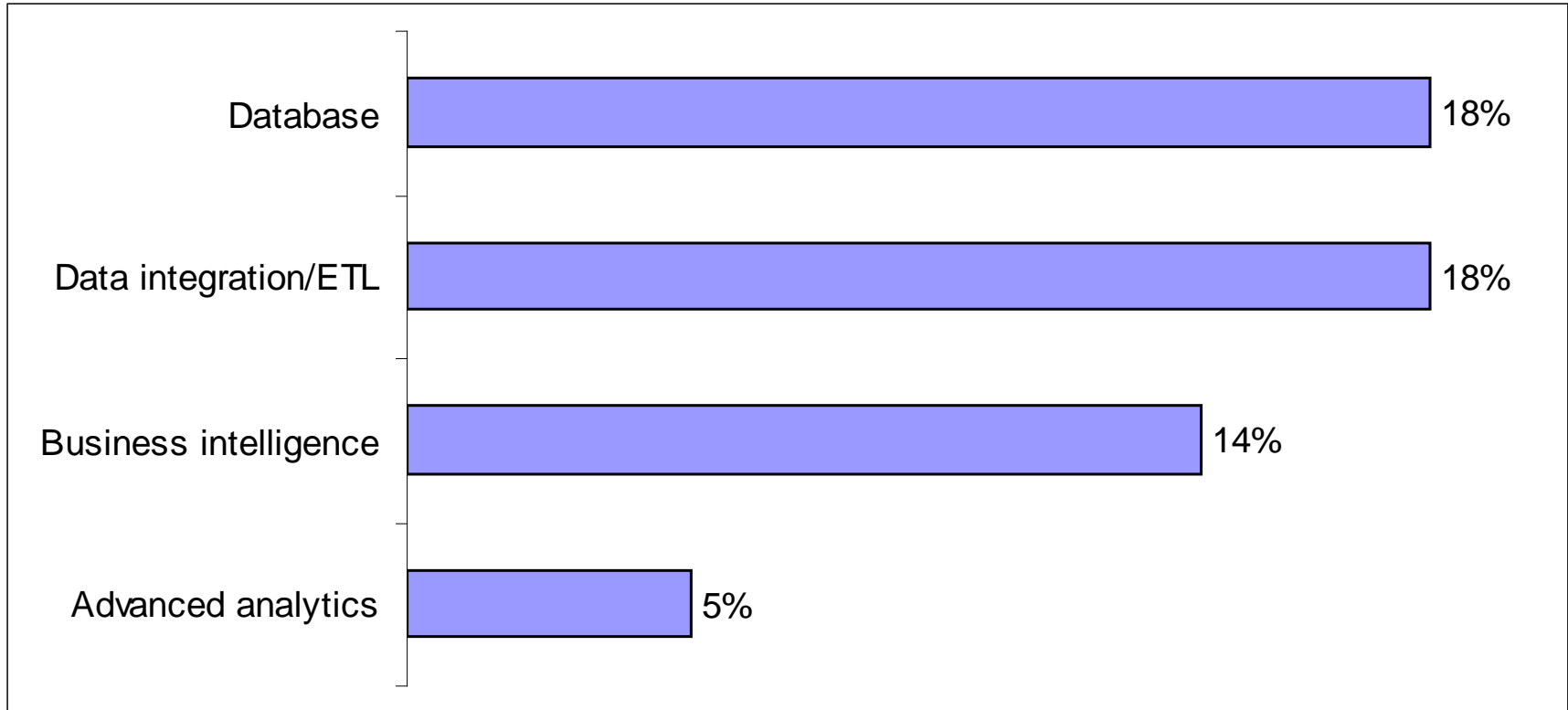
What you get:

- *Low cost*
- *Fast*
- *Quick to deploy*
- *Easy to use*

What it lacks:

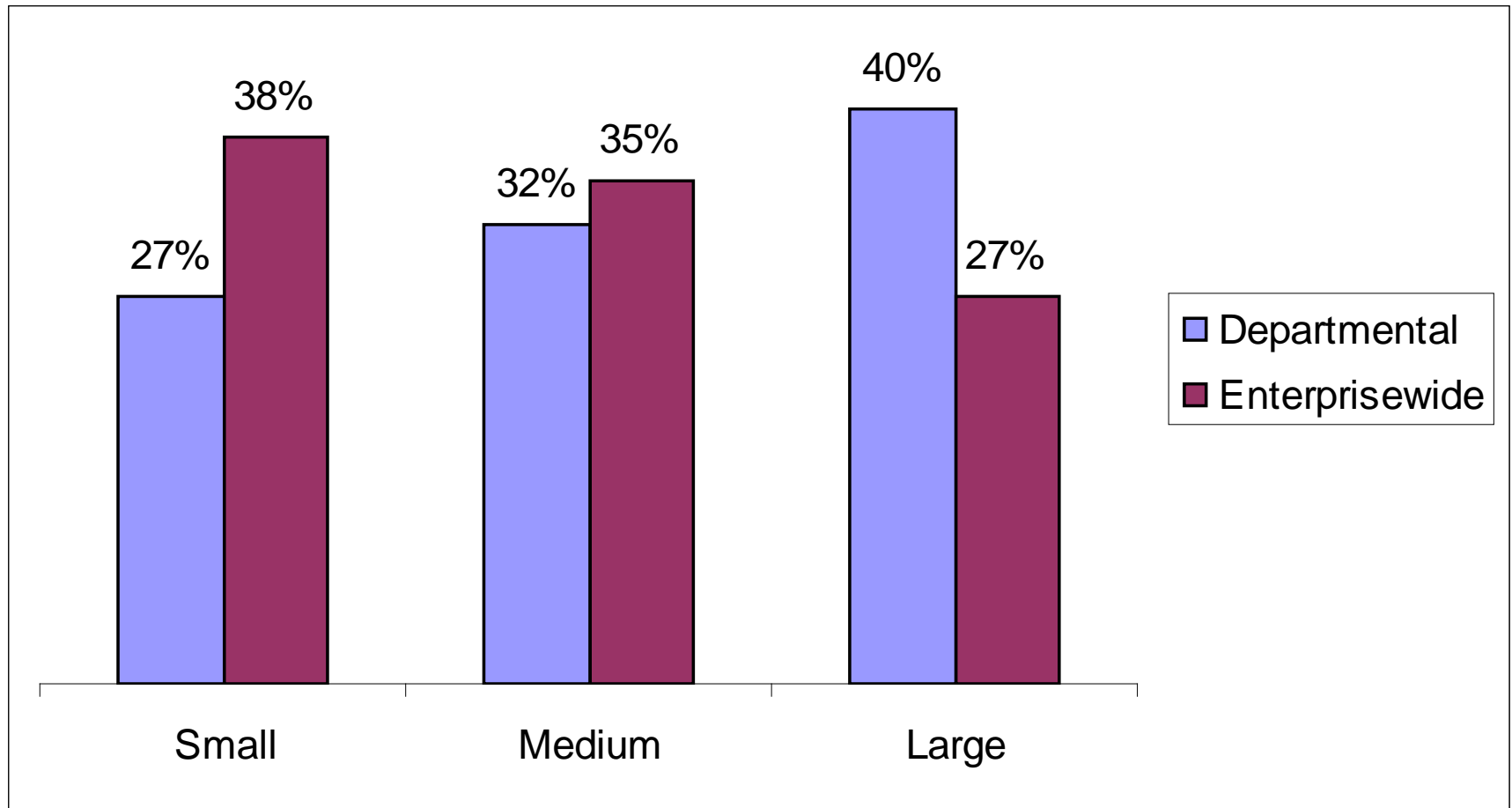
- *Reporting*
- *Metadata layer*
- *Dimensionality*
- *ETL/DQ*

Open Source Adoption



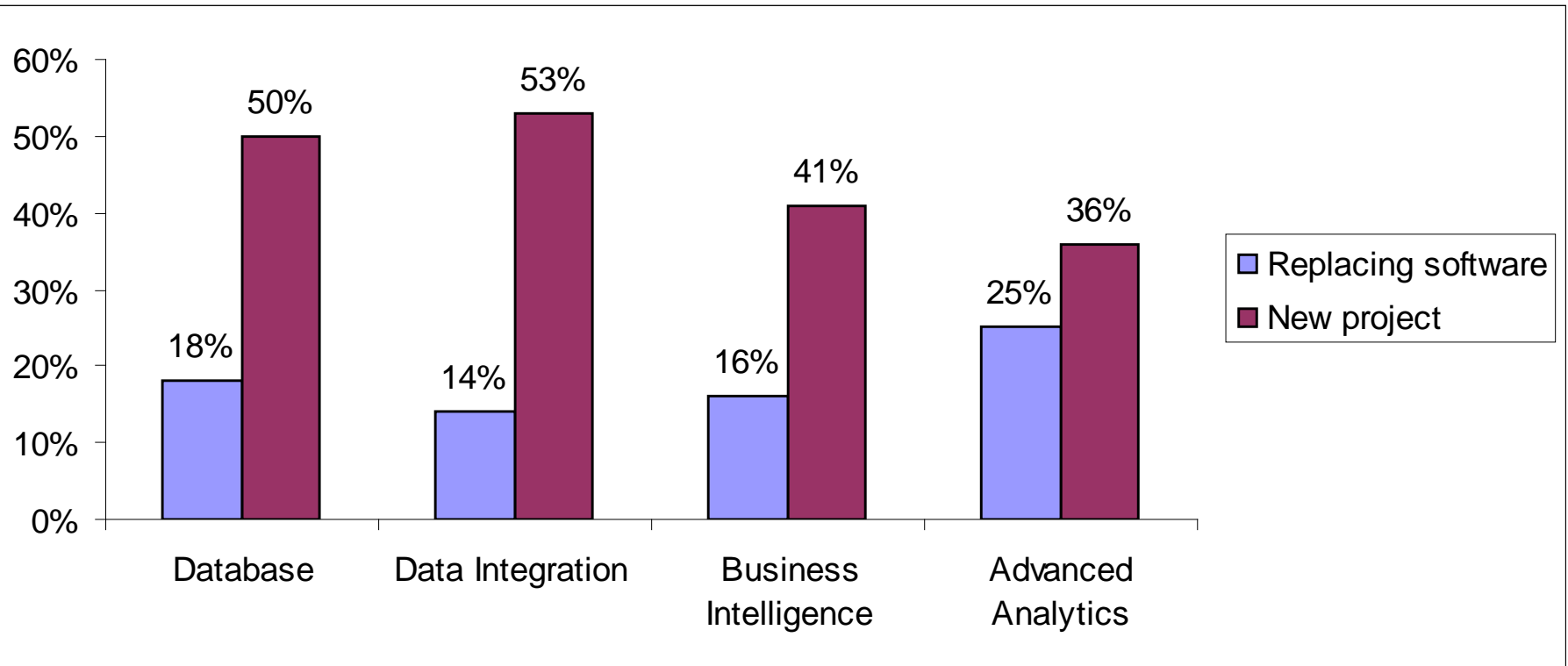
Based on 1,000+ respondents, from Mark Madsen, "Open Source Solutions: Managing, Analyzing, and Delivering Business Information" (BeyeNetwork and Third Nature), 2009

Open Source Customers



Based on 1,000+ respondents, from Mark Madsen, "Open Source Solutions: Managing, Analyzing, and Delivering Business Information" (BeyeNetwork and Third Nature), 2009

Projects



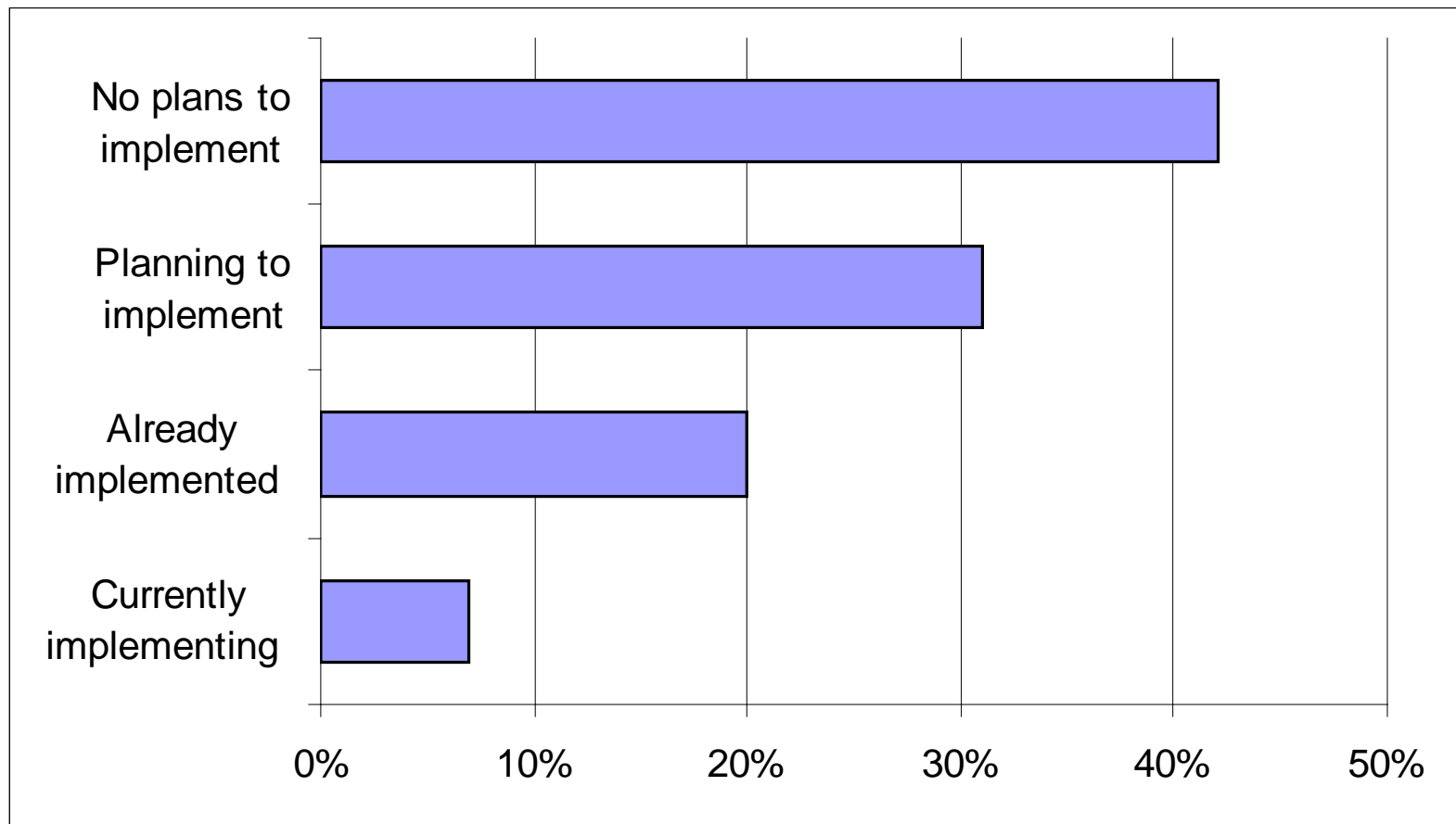
Based on 1,000+ respondents, from Mark Madsen, “Open Source Solutions: Managing, Analyzing, and Delivering Business Information” (BeyeNetwork and Third Nature), 2009

Benefits of Cloud Computing

- Pay as you go
- No IT resources required
- Expand capacity on demand
- Automatic upgrades
- Web-based access

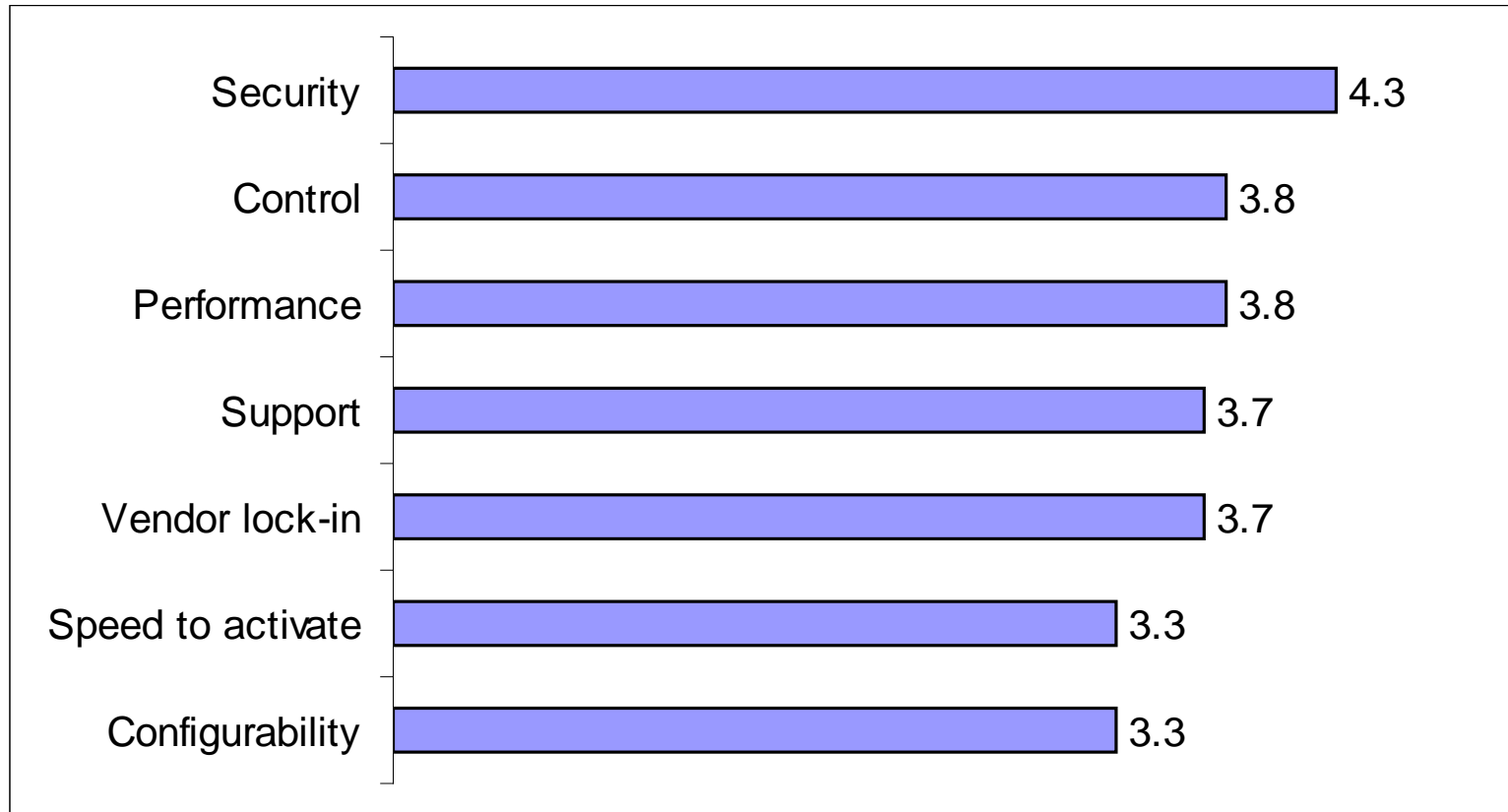


BI Cloud



Claudia Imhoff and Colin White, “BI SaaS”, BeyeNetwork Research, 2009. 294 respondents.

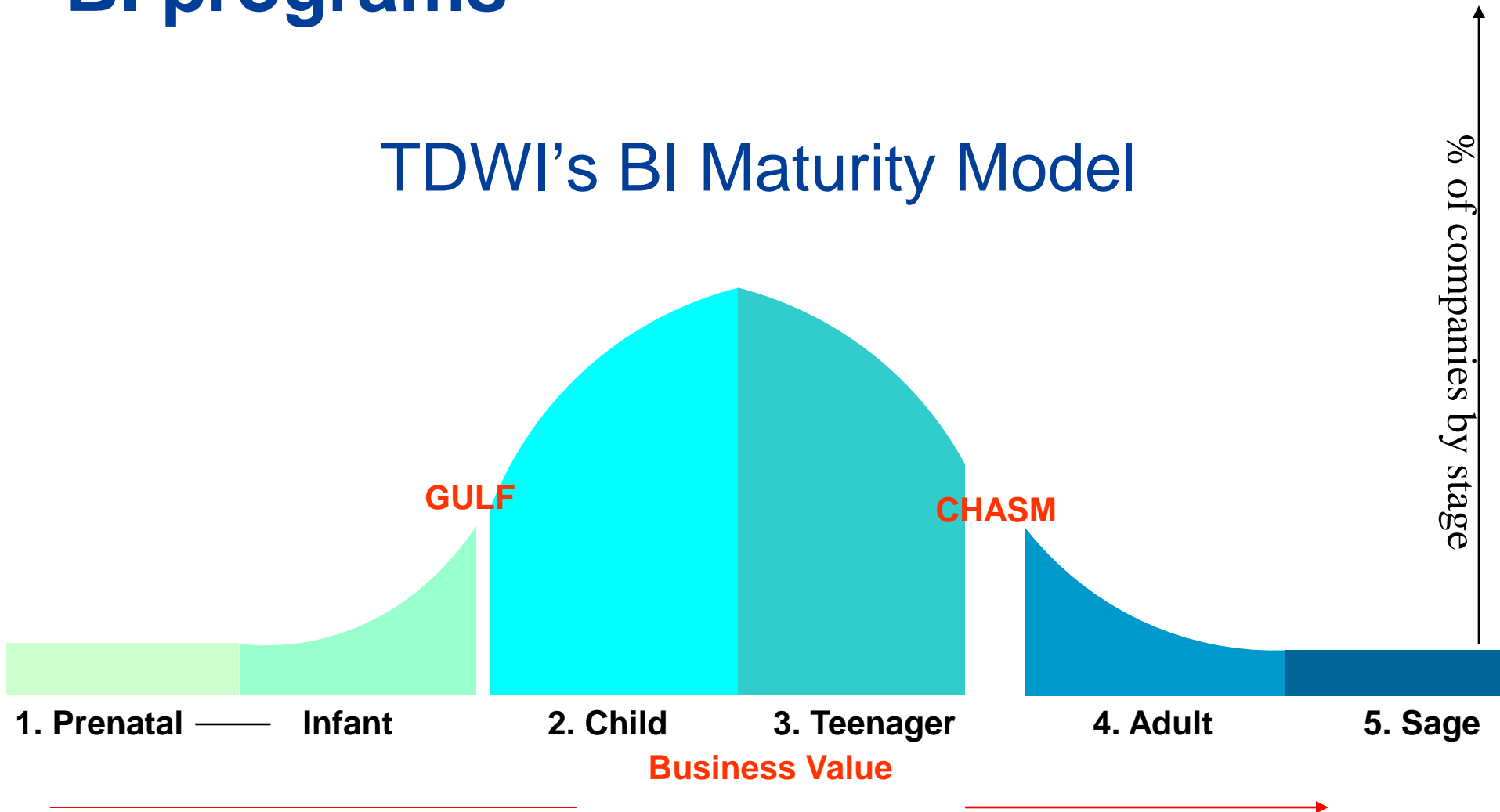
Cloud Concerns



Average ratings based on a five-point scale where 1=“not at all concerned” and 5=“very concerned”. Based on 172 respondents currently receiving or considering services from a cloud vendor. Source: Information Week, 2009

BI programs

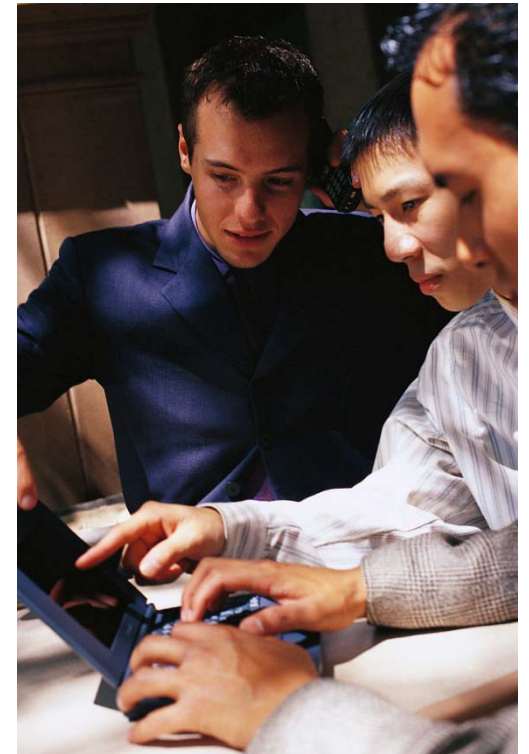
TDWI's BI Maturity Model



Partnership and Alignment

“We sit side by side with business people and report into the same leadership. The only difference is that we specialize in the data and they specialize in the business processes.”

Wes Flores, senior technology manager, Verizon



Hybrid Team

Departmental

- Understand business
- Develop ad hoc reports
- Support colleagues
- Extensions of BI team
- Serve on BICC



Departmental Super User



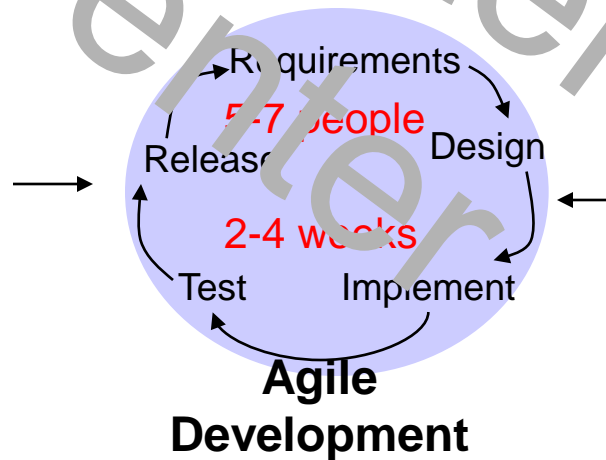
Purple Person

Enterprise

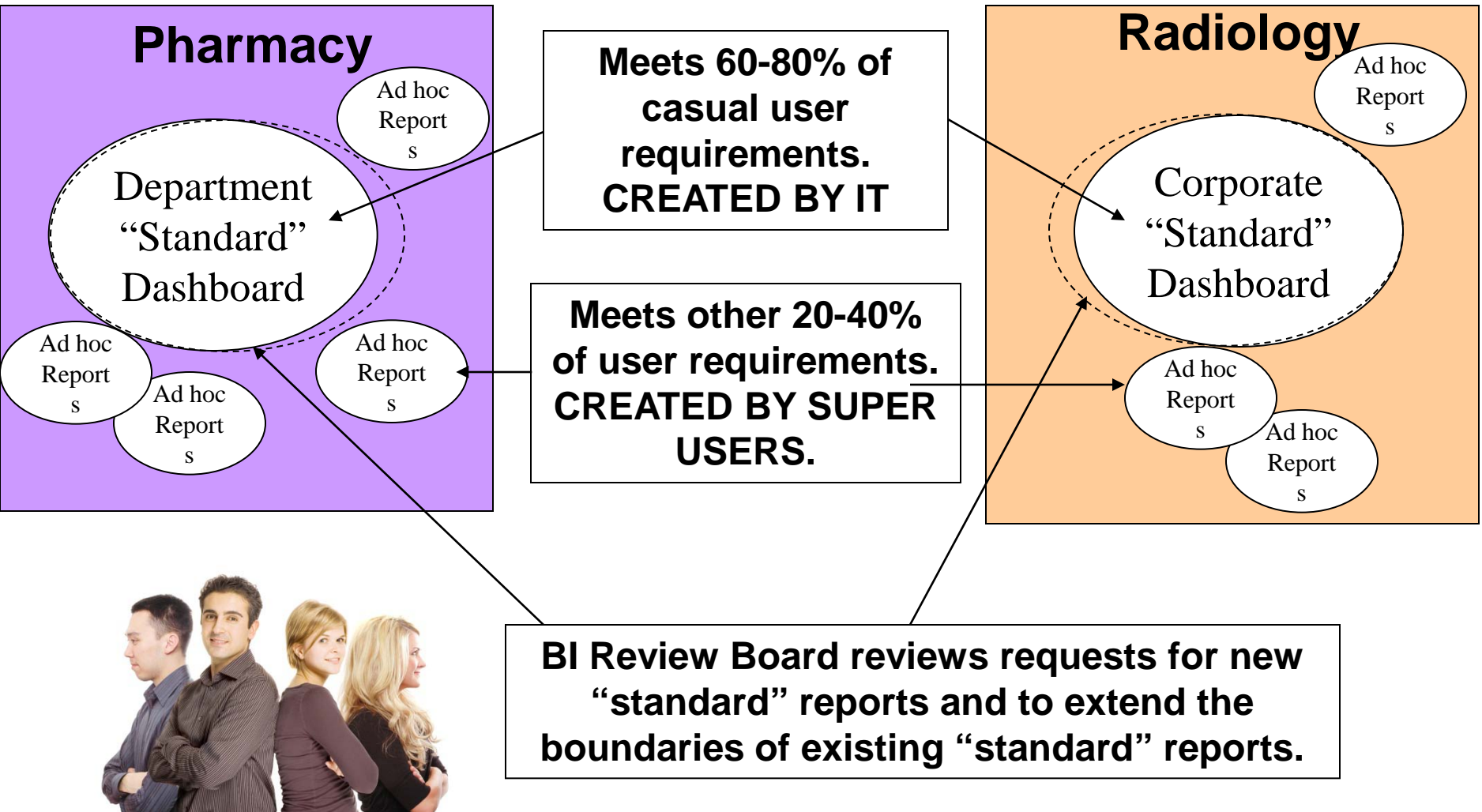
- Build the DW and DMs
- Build semantic layer
- Create standard reports
- Define best practices
- Recruit Super Users



Corporate BI Team



Report Governance

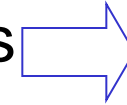


The last mile of BI – Users



Power Users

- Business analysts
- Analytical modelers
- Super users



61%

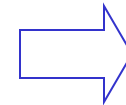
More flexible

More open

More analytical

Casual Users

- Executives
- Managers
- Front-line staff
- Customers & suppliers



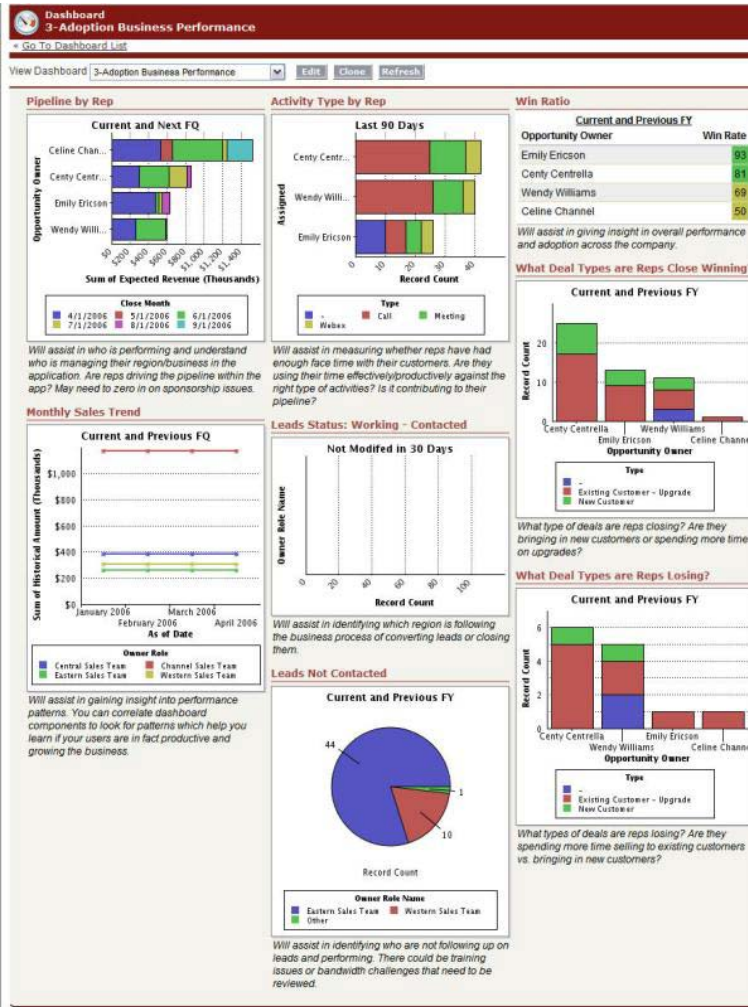
24%

More visual

More interactive

More tailored

What do casual users need?



- A layered information delivery system that parcels out information as needed...
- That is tailored to their role ...
- That meets 60-80% of their information needs ...
- And contains about 12 metrics and 20 dimensions
- And replaces dozens or hundreds of reports

Performance Dashboard

Functionality

Users

Monitor

Executives

Graphical
Data

Analyze

Managers

Summarized Data

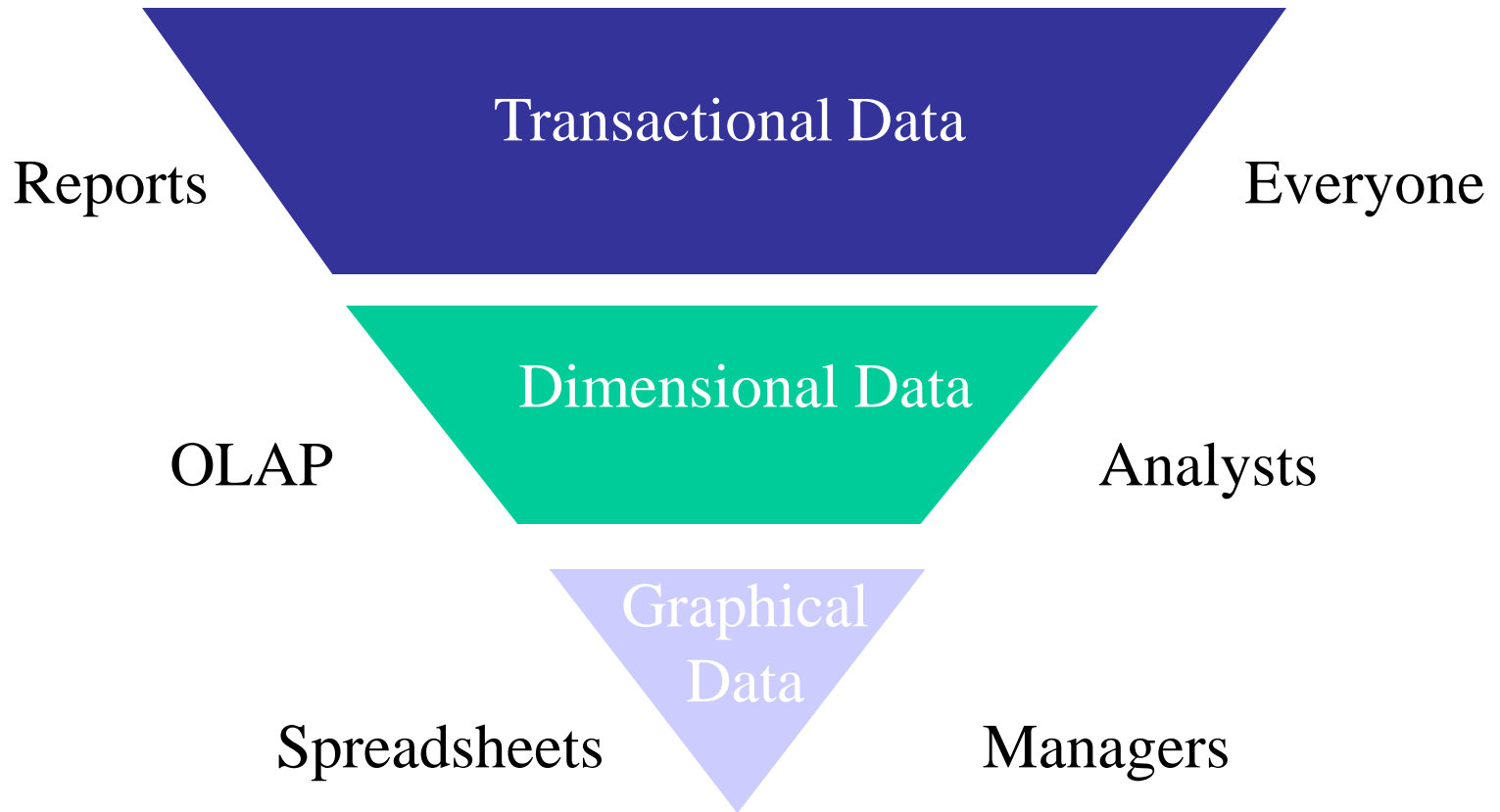
Detail

Workers

Detailed Data

MAD Sandbox

This is Insane!! Not MAD



Future – Double MAD!

Functionality

Adjacent Applications

Monitor

Graphical
Data

Model – “What if?”

Analyze

Summarized Data

Analytics and
visualization

Drill thru

Detailed Data

Deliberate &
Act



Signed in as Wayne M | My Account | Sign Out

Dashboards

Administration

Help



Period: October 2009, Locations: All, Products: All

Search Criteria

Executive Overview Finance Sales Production Logistics Safety

Financial Overview

Financial Performance

Net Margin



October 2009

Gross Margin



October 2009

Cost per Unit



October 2009

Accounts Receivable



October 2009

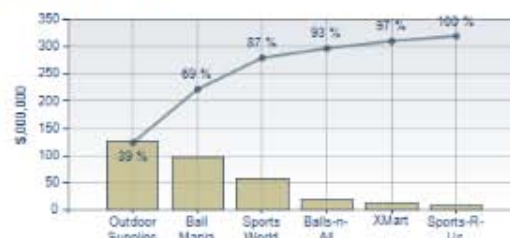
Financial Analysis

AR Balance



October 2009

AR Balance by Customer



October 2009

Wayne's World

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v3.1.10606.11146

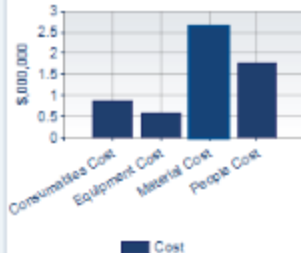


Period: October 2009, Locations: All, Products: All

Search Criteria

Executive Overview **Finance** Sales Production Logistics Safety**Expand Margin Drivers**
Showing summary data of metrics for
formula: $(\text{Revenue} - \text{Cost}) / \text{Revenue}$ **Margin**Revenue **\$9.8 M**Cost **\$5.9 M**

October 2009

Expand CostCategory
Showing summary data for
CostCategory**Cost**

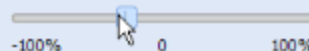
October 2009

What If Editor

Use the field below to enter a new value for the metric.

1980446

Alternatively use the slider to change the metric value percentage.



Reset

Submit

Close





Period: October 2009, Locations: All, Products: All

Search Criteria

Executive Overview **Finance** Sales Production Logistics Safety

Financial Overview

Net Margin



October 2009

Gross Margin



October 2009

Cost per Unit



October 2009

Accounts Receivable



October 2009

Expand Margin Drivers

Showing summary data of metrics for formula: $(\text{Revenue} - \text{Cost}) / \text{Revenue}$

Margin

Revenue \$9.8 M

Cost \$5.2 M

October 2009

Wayne's World

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v3.1.10606.11146





Period: October 2009, Locations: All, Products: All

Search Criteria

Executive Overview **Finance** Sales Production Logistics Safety

Financial Overview

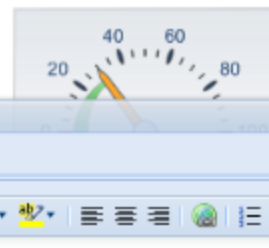
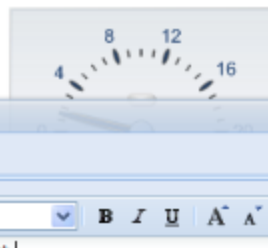
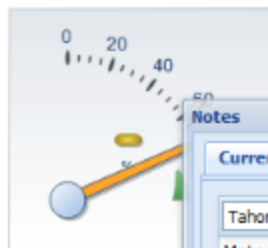
Financial Performance

Net Margin

Gross Margin

Cost per Unit

Accounts Receivable



October 2009

October 2009

Financial Analysis

AR Balance



October 2009

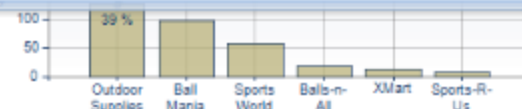
Notes

Current

Tahoma

Material cost |

Edit Save & Close Close



October 2009



Collaboration

- Today's capabilities
 - *Annotation, email, print,*
- Future
 - *Social media techniques*
 - Chat, rate, comment, follow
 - *Link to social media*
 - WebEx, Facebook, LinkedIn, Twitter, MySpace
 - *Integrate with collaboration platforms*
 - Google Wave, Sharepoint, 12Sprints, Google Docs
 - *iPhone BI "apps"*



“Today’s BI tools look like they were designed for people working in cubicles.” *Mark Madsen*

Swivel

Swivel | Totally Awesome Snow Dashboard - NorCal - Mozilla Firefox

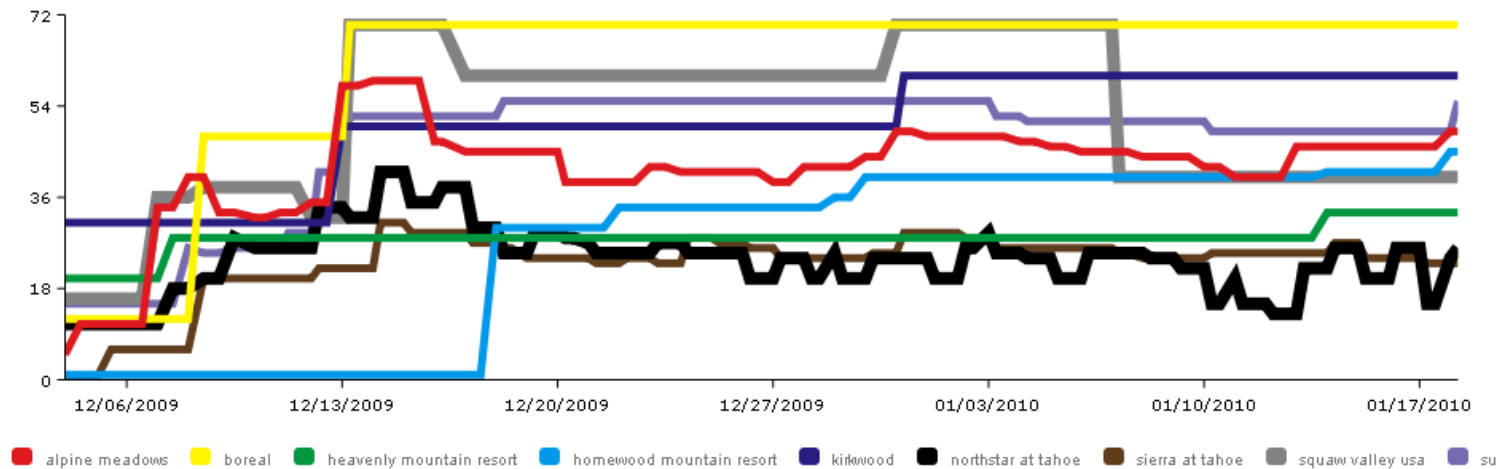
File Edit View History Bookmarks Tools Help

http://www.swivel.com/pages/250-Totally-Awesome-Snow-Dashboard-NorCal

RoboForm Search Logins (passcards) Wayne Eckerson Save Generate Sync

Jim Mason | LinkedIn TDWI: Data Warehousing E... Swivel | Totally Aweso... Infor ERP PRMS: ERP for s... 12SPRINTS | Sample Collab...

Base Depth at Lower Elevation | [Explore »](#)



Notes (6)

Order: Chronological | [Most Recent](#)

Gerard Suyderhoud | Dec 7, 2009 3:36pm
Hmm... the data in this report doesn't seem to be updating correctly.

Gangsta | Dec 10, 2009 4:40pm
mad fugly graph. how a knuckl heh bout to figa it outs?

Visnu | Dec 10, 2009 5:08pm
this is totally awesome.

Done

12Sprints (SAP)

12SPRINTS | Sample Collaboration Space - Mozilla Firefox

File Edit View History Bookmarks Tools Help

12sprints.com https://beta.12sprints.com/activities/single_item_view/TLPidz7ZjW2pbbbTbVT1v#i ibm system i servers

RoboForm Search Logins 12sprints Wayne Eckerson Save Generate Sync

Jim Mason | LinkedIn TDWI: Data Warehousing E... Thank You! | The White Ho... Infor ERP PRMS: ERP for s... 12SPRINTS | Sample C...

12SPRINTS Activities Updates Profile Extensions Action Items Hi Wayne Settings Sign out Search Activities

Sample Collaboration Space Activity Properties

Activity Updates

Add Content Add Tools Tools Catalog Add Participants View: [List View Icon]

RASIC Matrix

Responsible 0 1

Accountable

Discussion 1 1

Collection 0 0

Note T 0 0

Agenda 20 10

RASIC Matrix
Updated by Wayne Eckerson 2 minutes ago

Actions [Gear Icon]

TASK	WAYNE	MARK
Sneeze	Responsible	Consulted
Sniffle	Supports	Consulted
Cough	Accountable	Responsible

Click to add a description...

Comments (0) Action Items (1) References (0)

Action Items: Open | Completed

☐ You - Get Well
Status Due: Jan 19

2 Action Items (2 for you) 1 Participants (New: 0 Active: 1)

Done

feedback

Google Wave

Brainstorm: Inventing the Ideal Pet (Example Wave)

Reply Playback Archive Mute Spam Read Unread Trash

Sydney Waver (and Ace Douglas, Toby Hawker, ...): **Good** Sep 29

qualities:

- legs (definitely!)

Sydney Waver: There are no good pets that don't have legs: Sep 29

- fish
- snakes!
- worms

Greg Dalesandre: I agree, though I did have a goldfish that lived for 8 years... Sep 29

Heather McWave: Are you sure your parents didn't just keep buying you new identical ones? Sep 29

Sydney Waver: Don't ruin it! Sep 29

- cute with big eyes

Sydney Waver: As long as it's not all ET-esque... Sep 29

Greg Dalesandre: Good point. I think fur helps with that Sep 29

Let's play Sudoku!

Reply Playback Inbox Spam Read Unread Trash Move to

Board Level: **Easy**

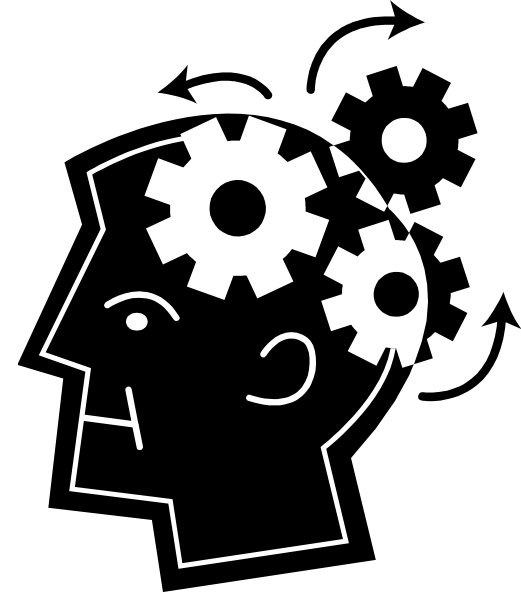
	2		6	9	5		3	
			8	1	4	5		6
1		6	7	2	3			
5				4	9		8	3
		1	5	3		2		4
	4	2		8	6			
	9		3	7	2		1	
	1		4	5	8			
		4	9	6	1			2

Current board state

- Sydney Waver
- Pamela Fox
- Dan Peterson
- Anna-Christina D...

Decision Governance

- Today: Monitor usage
- Tomorrow: Monitor decisions
 - *Are people interpreting data correctly?*
 - *Do they know what actions to take?*
 - *How are decisions made?*
 - *What decisions are made?*
 - *How effective were the decisions?*



“Premature Cognitive Disclosure”

Wayne Eckerson



Contact me:

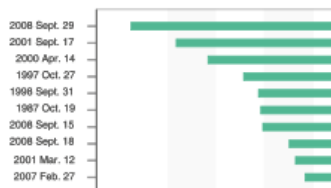
(781) 740-9504

weckerson@tdwi.org

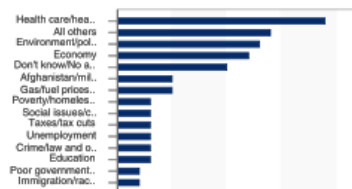
Twitter: weckerson

Blog: <http://portals.tdwi.org/waynesworld>

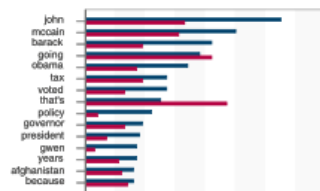
Source: [Open Secrets](#)



Source: [TIME](#)



Source: [CBC News](#)



Source: [NY Times](#) and [NY Times](#)

a whopping \$126,349. However, a closer look reveals that all of [McCain's contributions](#) came from [PACs](#). Six thousand of [Obama's contributions](#) came from PACs, but the majority (\$120,349) came from [individual contributions](#). [Read more](#).

Wall Street Meltdowns

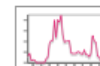
This graph shows the **top ten greatest single-day drops in the DOW Jones**. September 29, 2008 marked the largest single-day drop in history as the DOW plunged 778 points (7%). The recent drops have stoked fears that the U.S. economy is on the verge of a [recession](#), if not already deeply sunk in one. But if we take a look back into history, in terms of [market percentage loss](#) we haven't even come close to the catastrophic [stock market crashes](#) of 1987, 1929, and 1914. [Read more](#).

The most important issues in Canada

With the Canadian election called for October 14, 2008, the CBC has the results of a new poll on what the issues are. These **results are for the question "What do you think is the most important issue facing the country that the federal government should deal with?"** The [CBC has more results and analysis](#). —[selenized](#)

The VP Debate: Biden v. Palin

The highly anticipated Vice Presidential debate took place last night in St. Louis, Missouri. Voters across the country tuned in to see if VP candidates, Joe Biden and Sarah Palin, would stumble and exhibit their public speaking flaws. This graph shows the **words Biden and Palin used most frequently in the debate**. Both speakers referred to the Presidential candidates, John McCain and Barack Obama. They frequently used the words: going (38, 42), tax (27, 19), voted (27, 13), policy (22, 4), and Afghanistan (16, 12). [Read more](#).



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