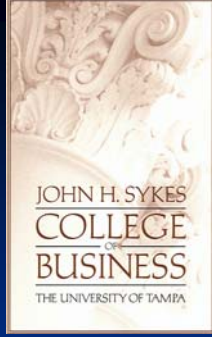




Meeting Agenda

- Networking
- Business Meeting
- Presentation and Panel Discussion:
Business Intelligence Systems
- Wrap-up



BUSINESS INTELLIGENCE SYSTEMS

Overview

Ms. Chinky Raj, UT

Panelists

Ms. Deborah Hughes, IBM

Mr. Roy Lauer, IBM

Dr. Ali Jenzarli, UT

Mr. Bob Patterson, Threshold Consulting Services

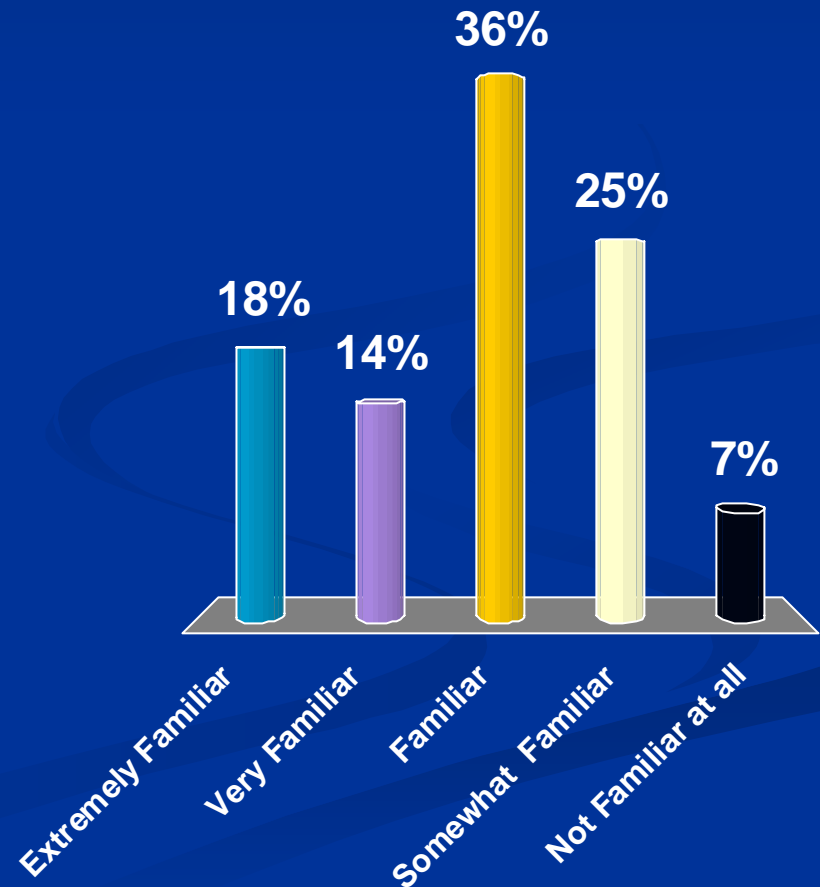


Outline of the Discussion

- Questions for the Audience (interactive response system)
- Overview of Business Intelligence Concepts
- Panel & Audience Interactive Discussion

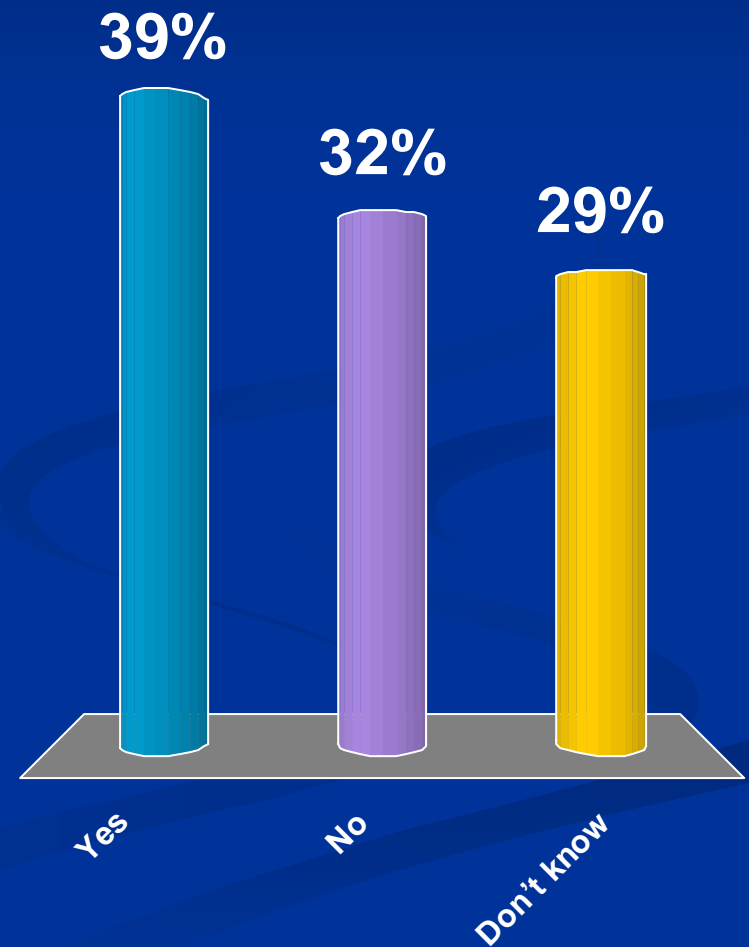
How familiar are you with the concept of “business intelligence”?

1. Extremely Familiar
2. Very Familiar
3. Familiar
4. Somewhat Familiar
5. Not Familiar at all



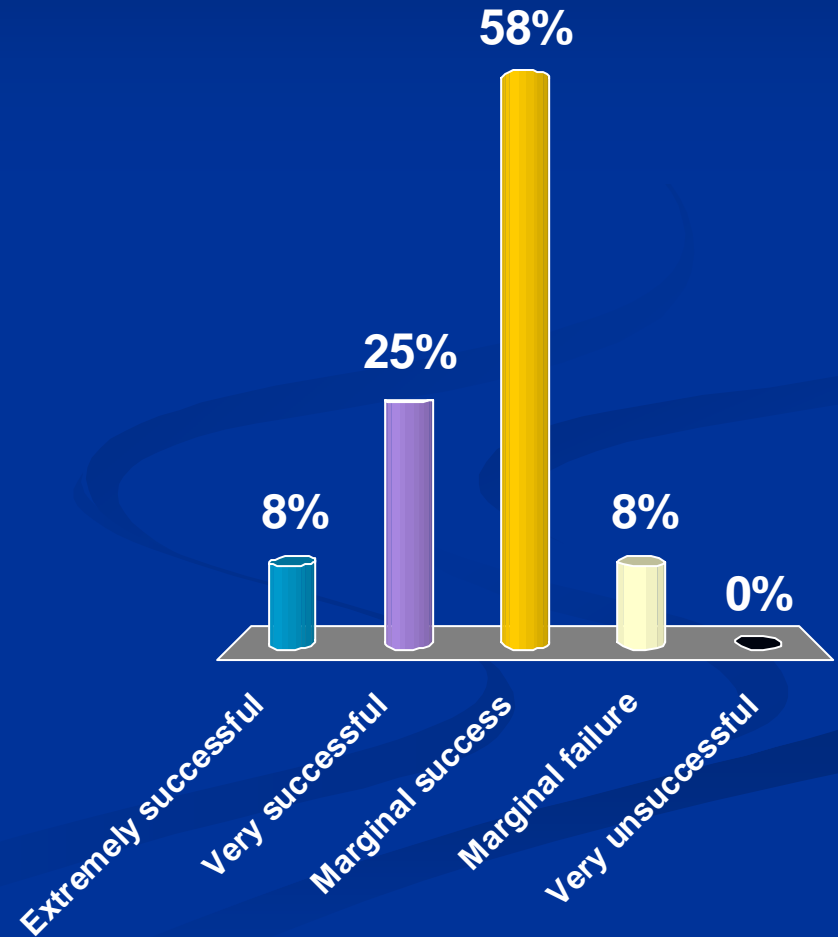
Has your organization has used business intelligence solutions?

1. Yes
2. No
3. Don't know



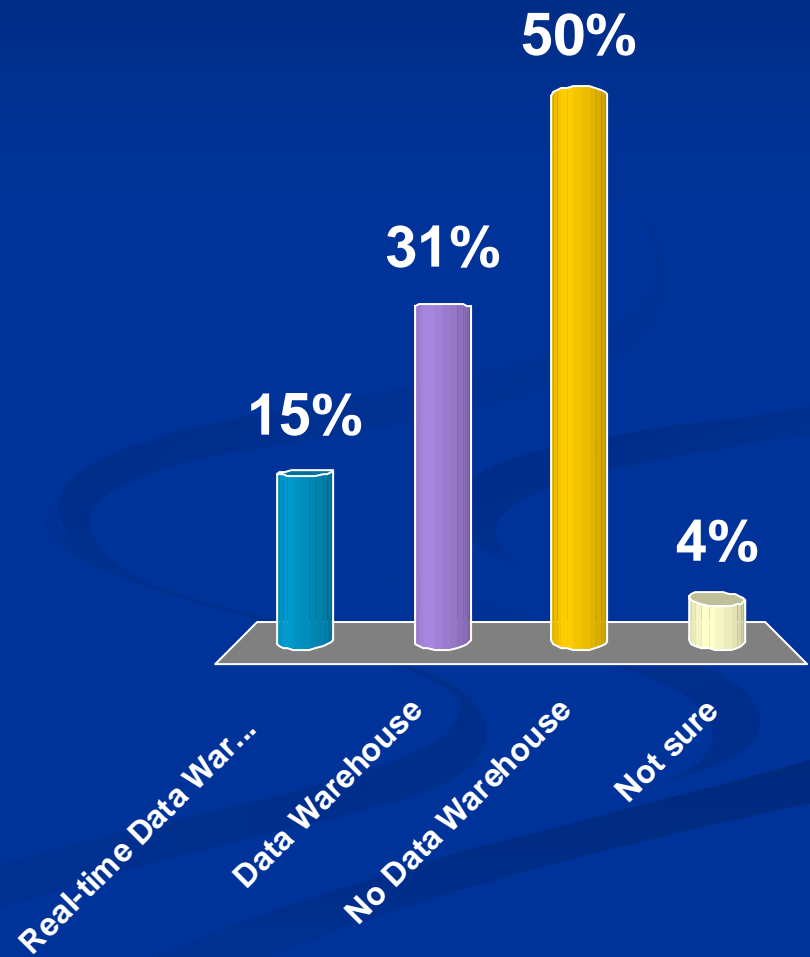
If your organization has implemented a business intelligence solution, how successful is it?

1. Extremely successful
2. Very successful
3. Marginal success
4. Marginal failure
5. Very unsuccessful



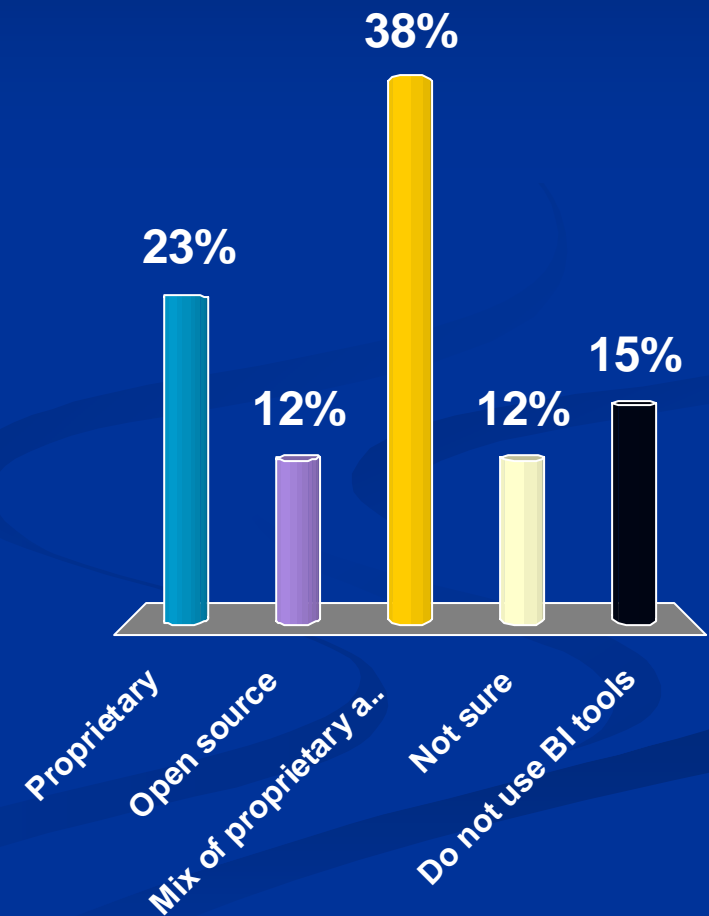
What type of data warehouse is your organization using?

1. Real-time Data Warehouse
2. Data Warehouse
3. No Data Warehouse
4. Not sure



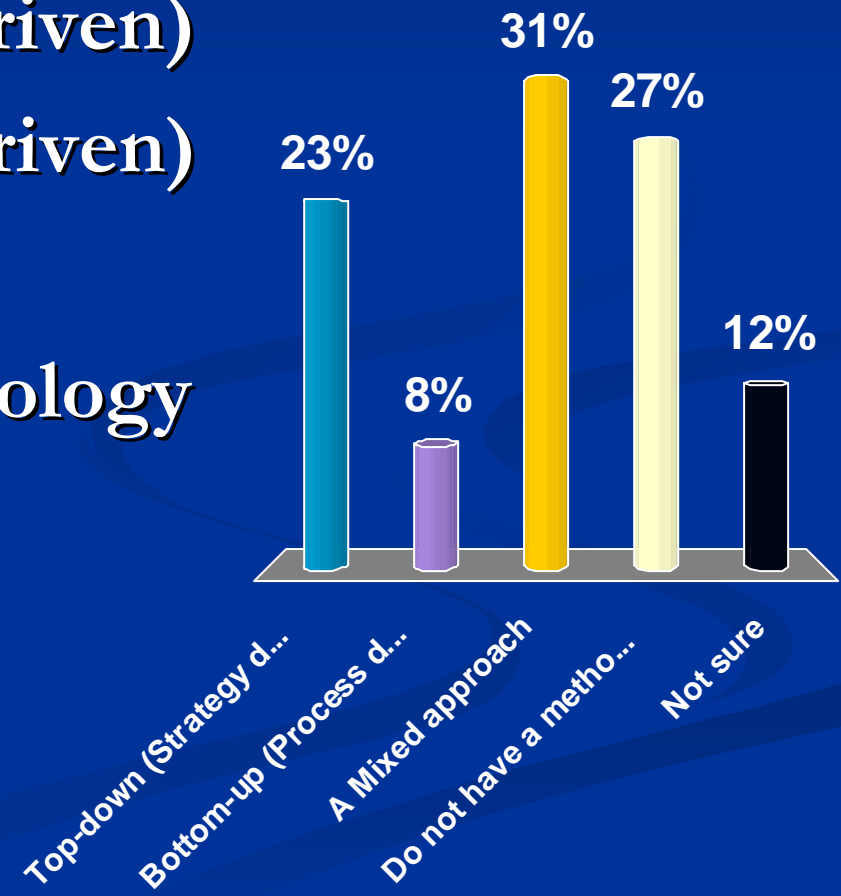
The type of BI tools in use within my organization are:

1. Proprietary
2. Open source
3. Mix of proprietary and open source
4. Not sure
5. Do not use BI tools



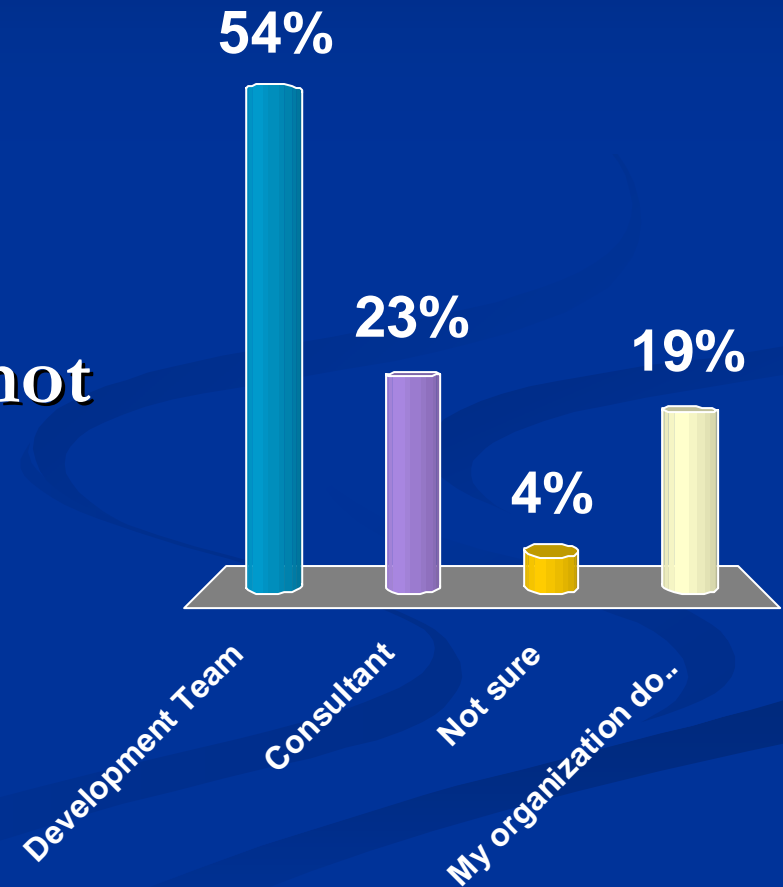
The Approach To BI Metric Development In My Organization Is:

1. Top-down (Strategy driven)
2. Bottom-up (Process driven)
3. A Mixed approach
4. Do not have a methodology
5. Not sure



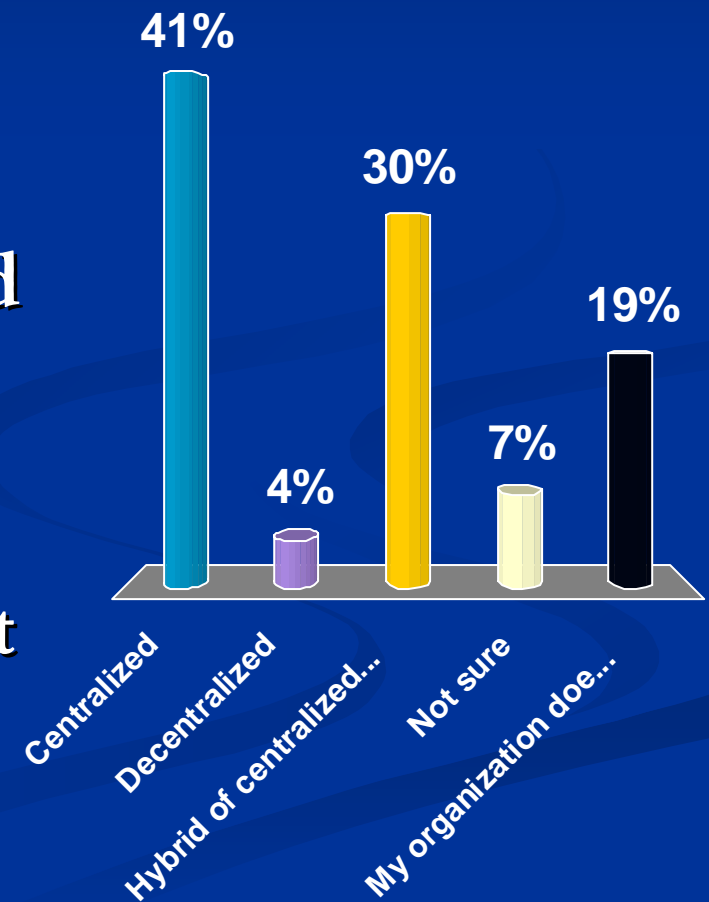
The role of the IT organization in my organization for BI development is as a:

1. **Development Team**
2. **Consultant**
3. **Not sure**
4. **My organization does not develop BI**



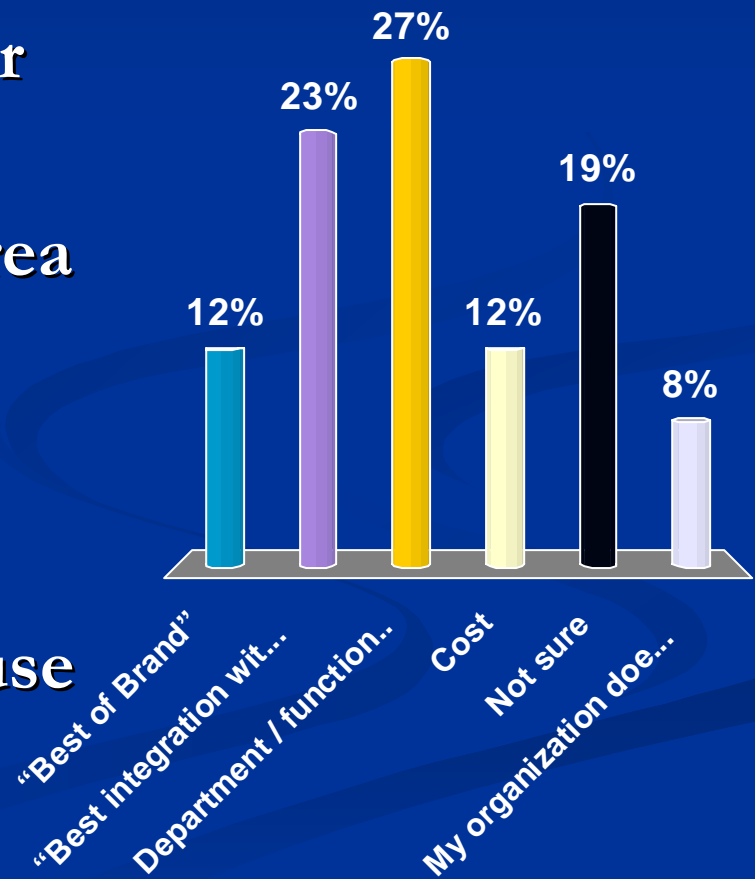
The control of business intelligence development in my organization is:

1. Centralized
2. Decentralized
3. Hybrid of centralized and mixed
4. Not sure
5. My organization does not develop BI



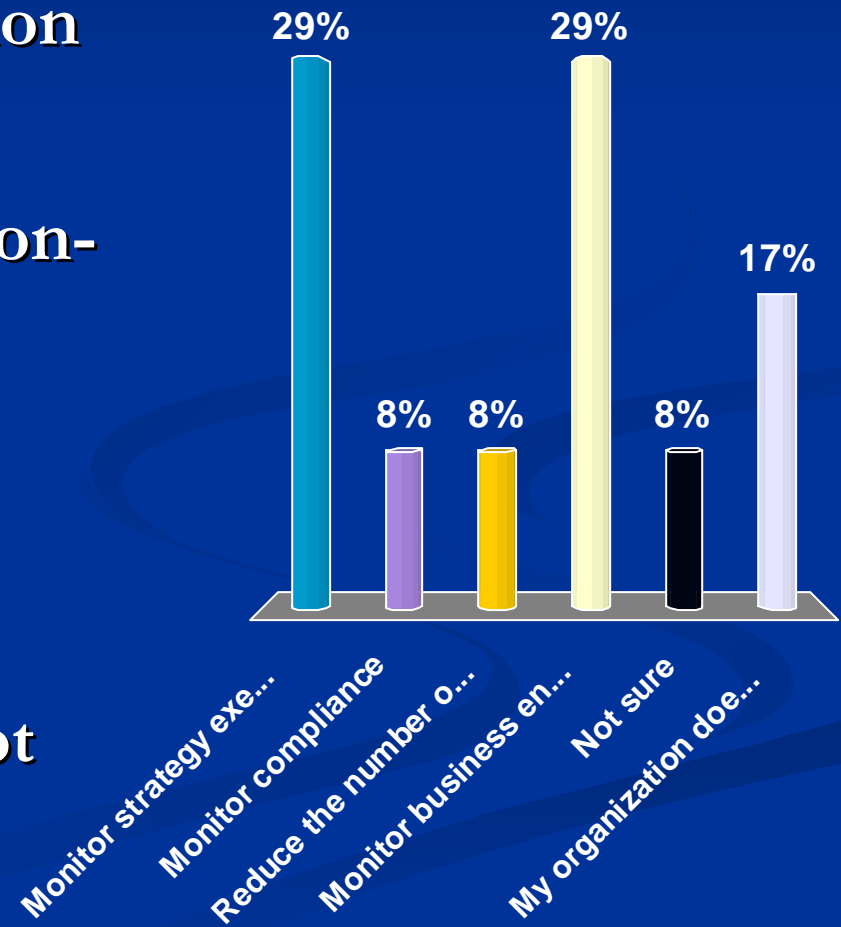
In my organization the basis for choosing Business Intelligence tools is:

1. “Best of Brand”
2. “Best integration with other systems”
3. Department / functional area driven
4. Cost
5. Not sure
6. My organization does not use BI tools



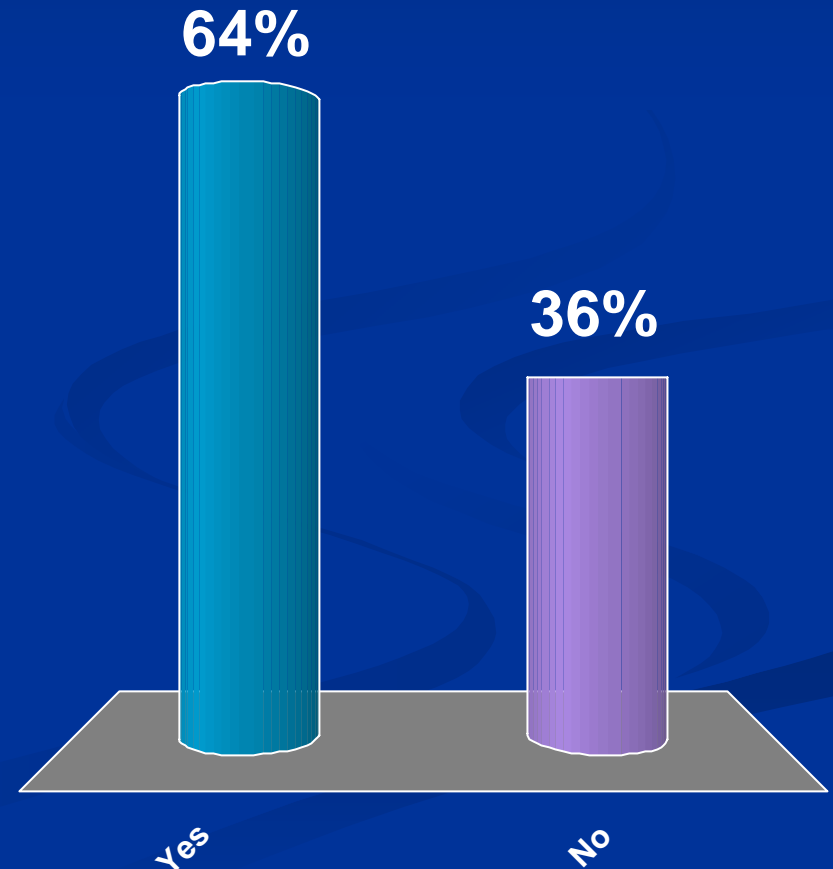
The major impact of BI in my organization is to:

1. Monitor strategy execution
2. Monitor compliance
3. Reduce the number of non-strategic projects
4. Monitor business environment changes
5. Not sure
6. My organization does not develop BI



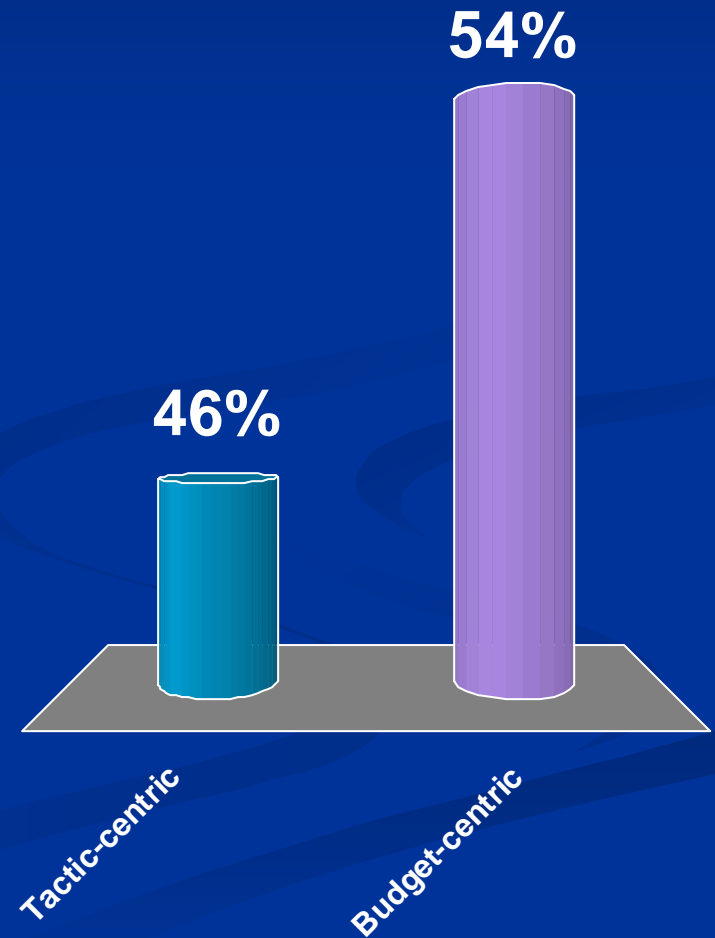
Is extremely rapid growth in data an issue in my organization?

1. Yes
2. No



Operational planning in my organization is:

1. **Tactic-centric**
2. **Budget-centric**



Business Intelligence Concepts

Business Intelligence and Decision Support

In the early 1970's Scott-Morton defined DSS as
“interactive computer-based systems, which help
decision makers utilize data and models to solve
unstructured problems”

Keen and Scott-Morton (1978) provided another
classic definition:

“Decision support systems couple the intellectual
resources of individuals with the capabilities of the
computer to improve the quality of decisions. It is
a computer-based support system for management
decision makers who deal with semi-structured
problems”

Types of DSS

The two major types are:

- Model-oriented DSS, in which quantitative models are used to generate a recommended solution to a problem
- Data-oriented DSS, which support ad hoc reporting and queries.

Business Intelligence (BI)

- Business Intelligence is an umbrella term that combines architectures, tools, databases, analytical tools, applications, and methodologies.
- BI's major objective is to enable interactive access (sometimes in real-time) to enable manipulation of data.

The Information Factory View

- *Enterprise information factory* is a way to describe how companies conduct and organize BI efforts.
- A cornerstone component of the factory concept is the Data Warehouse

Major Components of an Information Factory

■ *Inputs*

- Data sources
- Acquisition

■ *Storage*

- DW
- Data marts

■ *Processing of inputs*

- Analysis
- Data mining

■ *Outputs*

- Data delivery
- BI applications

The Corporate Information Factory

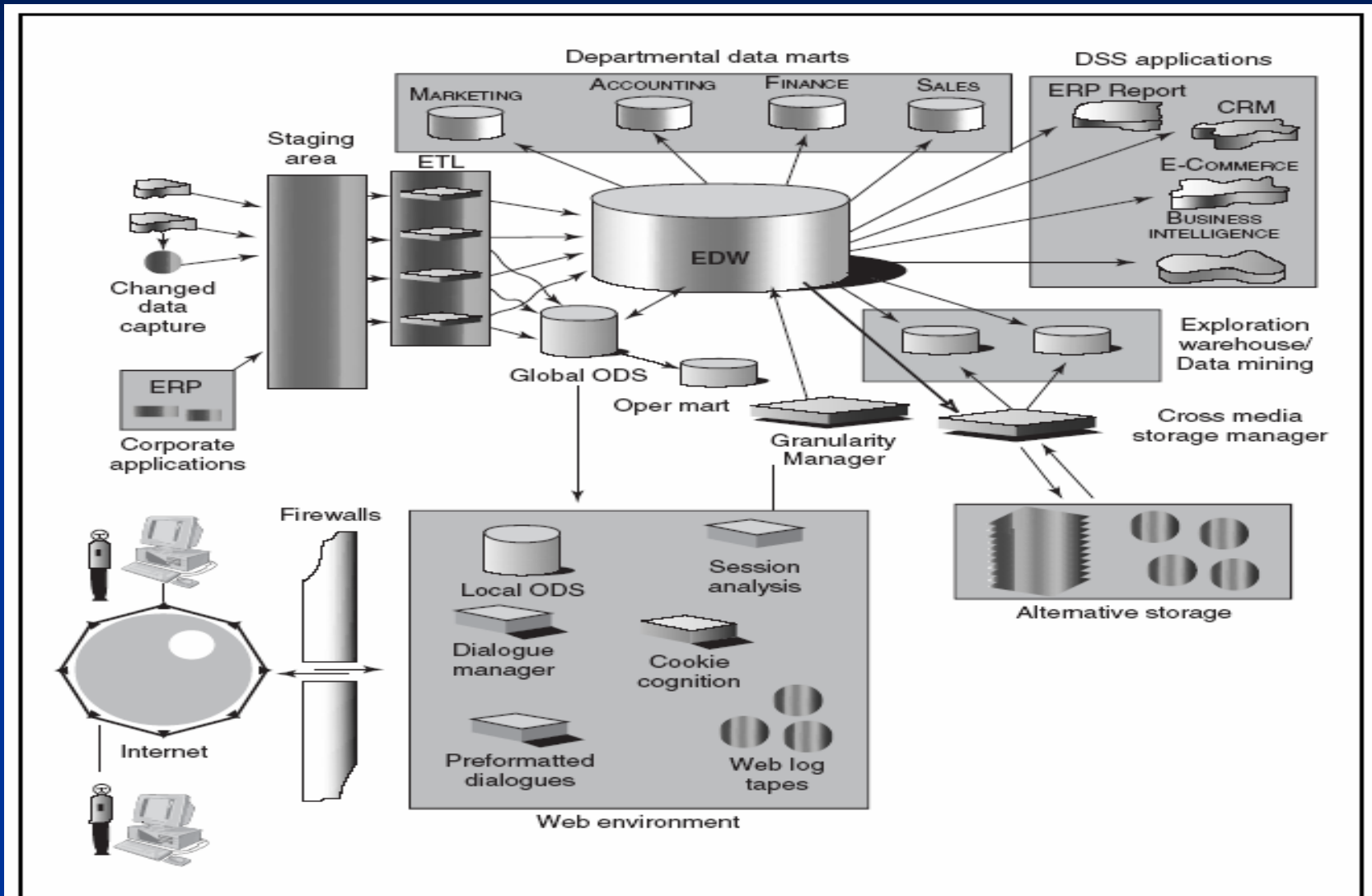


FIGURE 5.2 The Corporate Information Factory

The Architecture of BI

Four components of BI systems:

- Data warehouse
- Business performance management (BPM)
- User interface (e.g., a dashboard)
- Business analytics

Data Warehousing

In simple terms, a data warehouse (DW) is a pool of data produced to support decision making

It is also a repository of current and historical data of potential interest to managers throughout the organization.

Enterprise Data Warehouses (EDW)

- Is a large-scale data warehouse that is used across the enterprise for decision support.
- Used to provide data for DSS like:
 - CRM: Customer relationship management
 - SCM: Supply chain management
 - BPM: Business performance management
 - BAM: Business activity monitoring
 - PLM: Product lifecycle management
 - KMS: Knowledge management systems

Characteristics of Data Warehousing

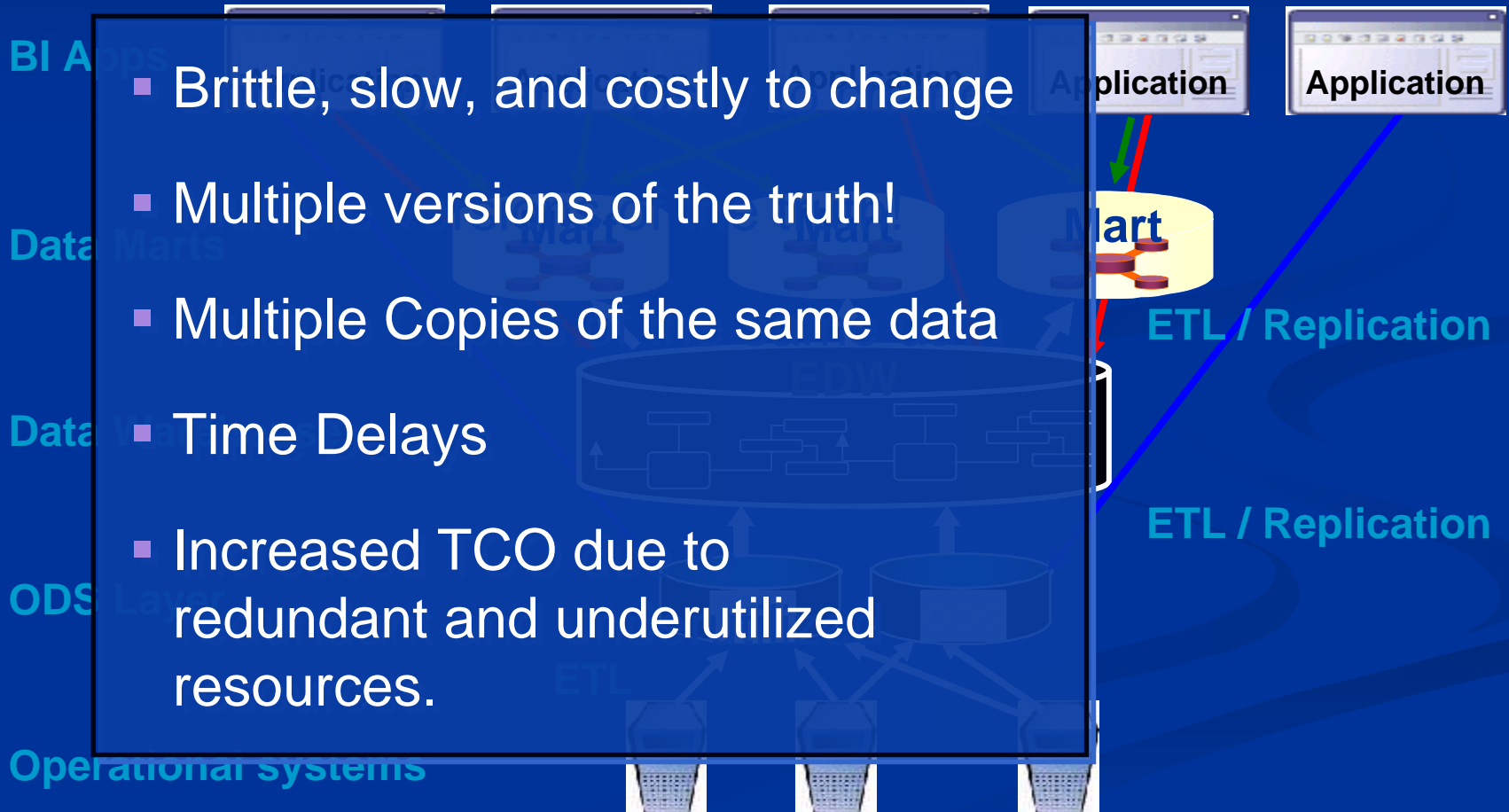
- Subject oriented
- Integrated
- Time variant (time series)
- Include metadata
- Web-based
- Relational/multidimensional
- Client/server
- Real-time
- Nonvolatile

Data Marts

- A subset of a data warehouse , typically consisting of a single subject area, e.g. marketing
- A dependent data mart is a subset that is created directly from the data warehouse.
- An independent data mart is a small warehouse designed for a strategic business unit (SBU) or a department, but its source is not an EDW

Traditional Warehouse & Datamart Infrastructure

- Brittle, slow, and costly to change
- Multiple versions of the truth!
- Multiple Copies of the same data
- Time Delays
- Increased TCO due to redundant and underutilized resources.



The Enterprise Warehouse Environment

- Single infrastructure enables rapid adaptation of applications to changing business needs.
- Analytics may access data across all layers of the warehouse.
- Single version of the truth
- Low latency and “right-time” data movement
- Reduced TCO for applications and for warehouse management



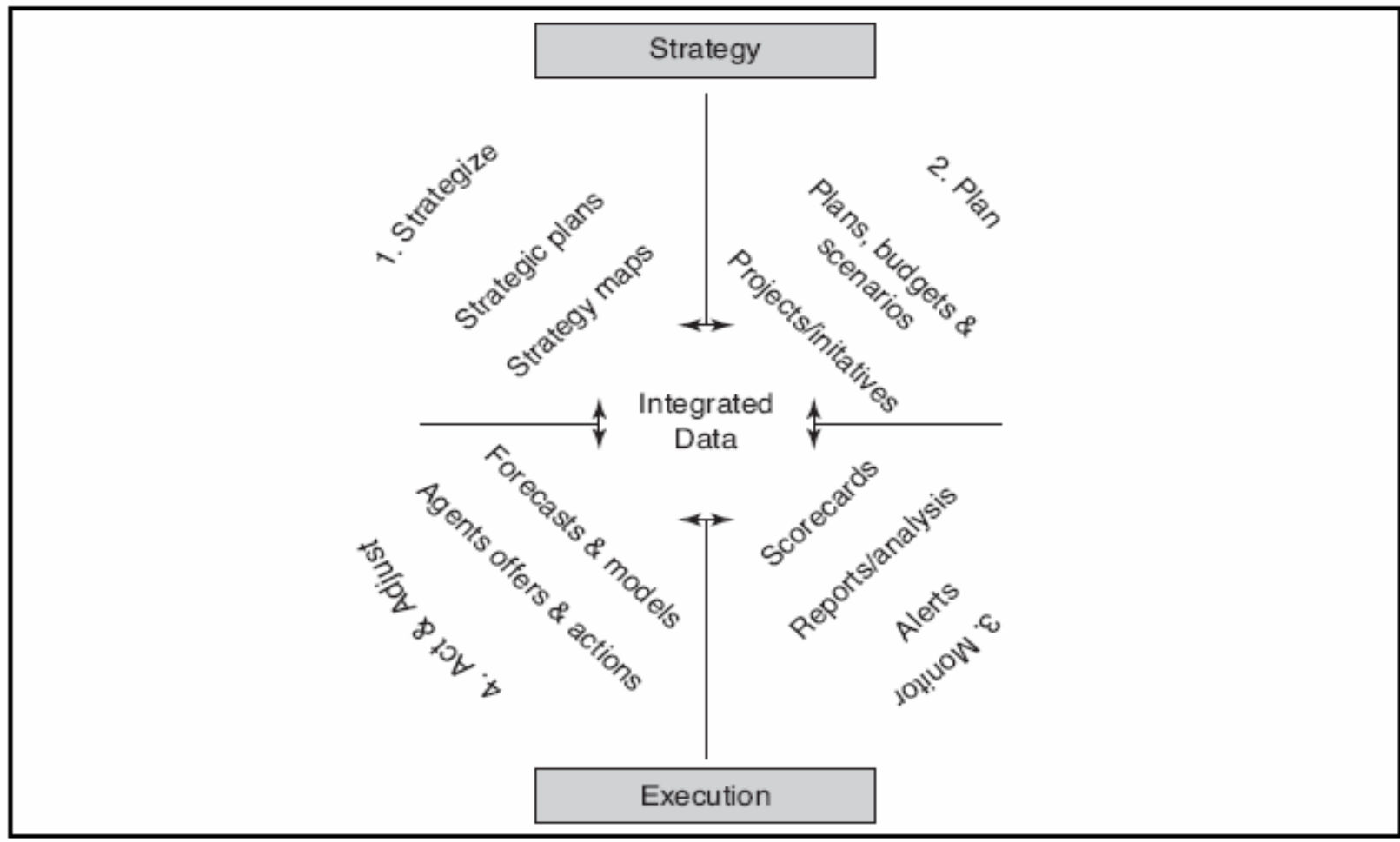
Business Performance Management (BPM)

“A framework for organizing, automating, and analyzing business methodologies, metrics, processes, and systems to drive the overall performance of the enterprise.”

BPM Standards Group (2005)

Business Performance Management (BPM): A Closed Loop Process

FIGURE 9.1 BPM Closed-Loop Processes



Strategize: What tools are available for Planning?

- **Balanced Scorecard Methodology**

a framework for defining, implementing, and managing an enterprise's business strategy by linking objectives with factual measures

- **Dashboards**

A visual presentation of critical data for executives to view. It allows executives to see hot spots in seconds and explore the situation

Difference Between Dashboards and Scorecards

| Characteristic | Dashboard | Scorecard |
|-----------------------|--------------------------|------------------------------|
| Purpose | Measures performance | Charts progress |
| Users | Supervisors, specialists | Executives, managers, staff |
| Updates | “Right-time” feeds | Periodic snapshots |
| Data | Events | Summaries |
| Display | Visual graphs, raw data | Visual graphs, text comments |

Differences Between Traditional BI and BI for BPM

| FACTOR | Traditional BI | BI for BPM |
|---------------|-----------------------|----------------------------|
| Scale | Departmental | Enterprise-wide |
| Focus | Historical | Timely |
| Decisions | Strategic | Strategic, operational |
| Users | Analysts | Everyone |
| Orientation | Reactive | Proactive |
| Process | Open-ended | Closed-loop |
| Measures | Metrics | Key performance indicators |
| Views | Generic | Personalized |
| Visuals | Tables/charts | Dashboards/scorecards |
| Collaboration | Informal | Built-in |
| Interaction | Pull (ad hoc queries) | Push (alerts) |
| Analysis | Trends | Exceptions |
| Data | Numeric only | Numeric, text, etc. |

Plan: How Do We Get There?

- Operational planning

 - **Operational plan**

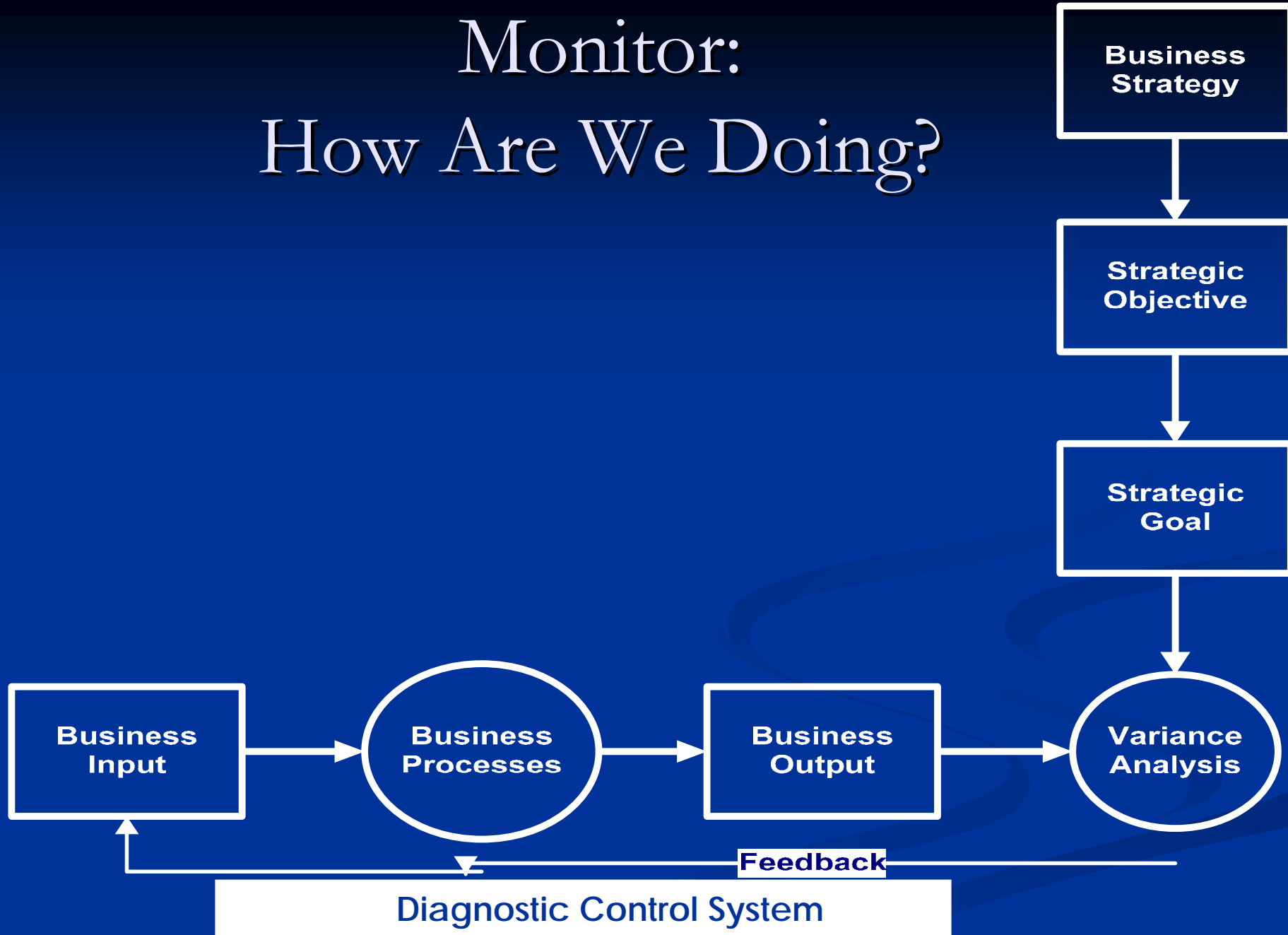
 - Plan that translates an organization's strategic objectives and goals into a set of well-defined tactics and initiatives, resources requirements, and expected results

- Operational planning

 - *Tactic-centric* plan—tactics are established to meet the objectives and targets established in the strategic plan (used by best practices organizations)

 - *Budget-centric* plan—a financial plan or budget is established that sums to the targeted financial values

Monitor: How Are We Doing?



Act and Adjust:

What Do We Need to Do Differently?

- Hackett Group's benchmarking process divides planning and management reporting into four sub-processes:
 1. Strategic planning
 2. Operational and financial planning
 3. Reporting
 4. Forecasting

Act and Adjust: What Do We Need to Do Differently?

- Each sub-process is evaluated in terms of five dimensions of efficiency and effectiveness:
 1. Strategic alignment
 2. Partnering
 3. Process
 4. Technology
 5. People and organizations

Business Analytics

Business Analytics (BA) is a broad category of applications and techniques for gathering, storing, analyzing, and providing access to data to help enterprise users make better business and strategic decisions.

Four Strategies to Broaden BI Adoption

- **Task Orientation: “Ease of use” defined individually**
- **Connection to Office: Deliver information in productivity tools that are already familiar**
- **English language Search: Users do not navigate, but search information**
- **Event-driven BI delivery: Have the information find the user instead of vice versa**

Toward Competitive Intelligence and Advantage

- Competitive intelligence (CI)
 - CI implies tracking what competitors are doing by gathering sources of materials on their recent and in-process activities
 - BI initiatives use some outside sources of data included in the analysis process, but they are often available from third-party vendors

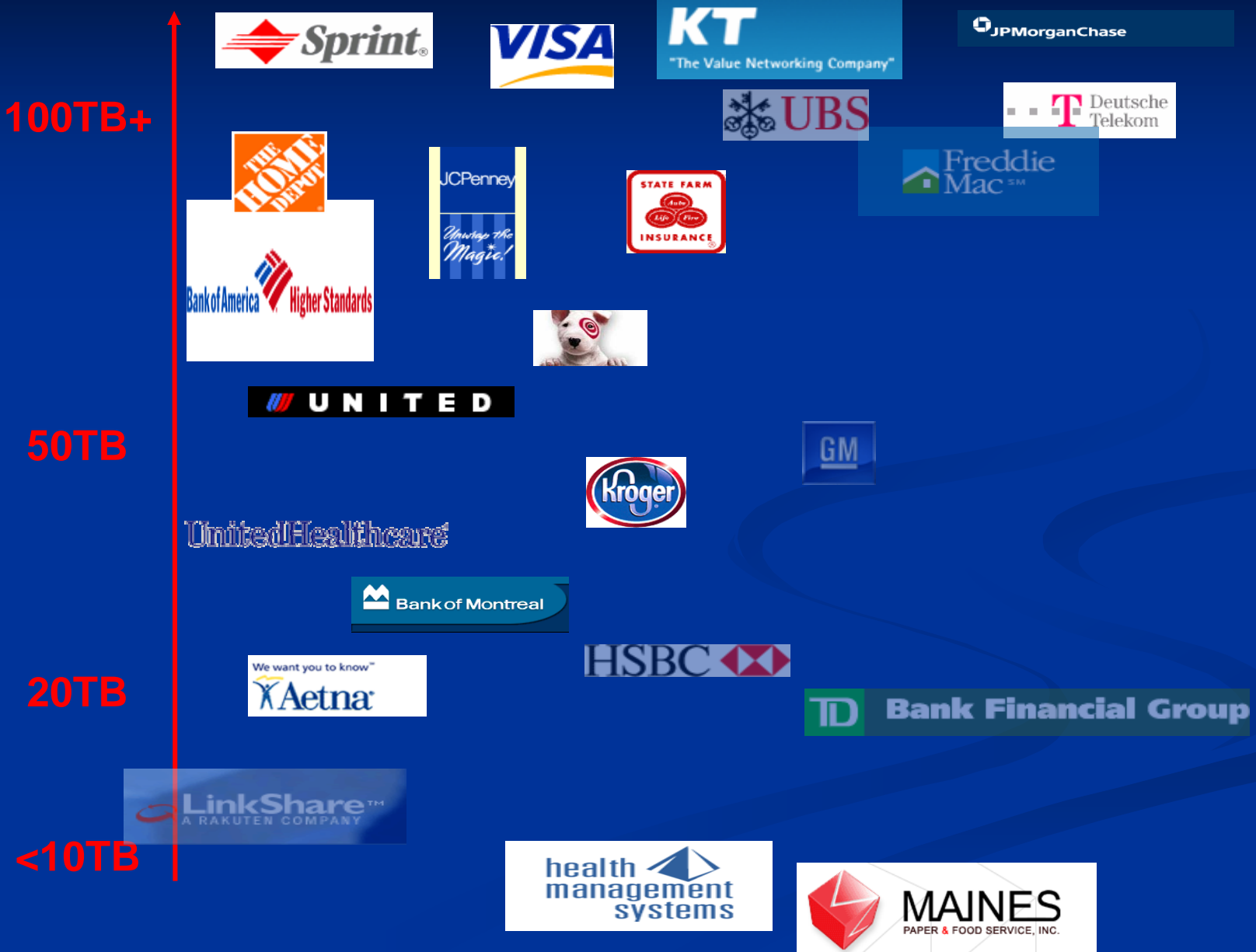
Toward Competitive Intelligence and Advantage

- Competitive strategy in an industry
 - Competitor analysis is a component of *industry analysis*, which serves as a basis for strategic planning processes
 - BI applications in this context might include:
 - scrutinizing quality metrics associated with specific production processes
 - analyzing raw materials from various suppliers to assess defect rates,
 - tracking costs of goods sold as a percentage of run volume

Panel Discussion

IBM References

Performance at all Levels and Data Volumes



IBM Delivering Business Value on LINUX



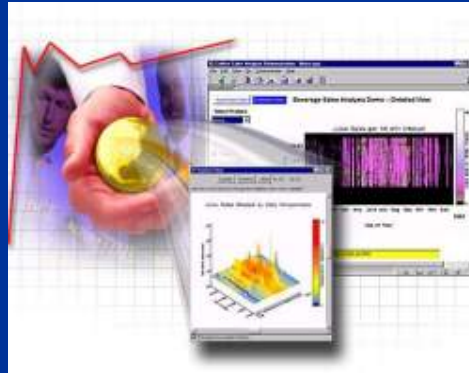
Open-standards-based technologies in a pre-integrated BCU increased time to market



IBM outperformed all other platforms during a production simulations and maintained the lowest TCO/PCO



IBM demonstrated superior performance at the lowest PCO



IBM outperformed all other platforms and allowed Linkshare to support over 900,000 queries per-day on a single enterprise environment



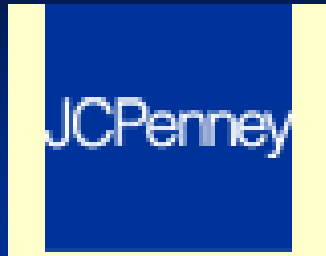
Large Warehouse, Need Real-time? IBM is the leading replacement for legacy EDW's when business maturity cycle reaches real-time



Large Warehouse, Need Real-time? IBM demonstrated significant value through sustainable RT

IBM Delivering Business Value on

AIX



Superior Value-

IBM was the only solutions that demonstrated sustainable, Real-time performance

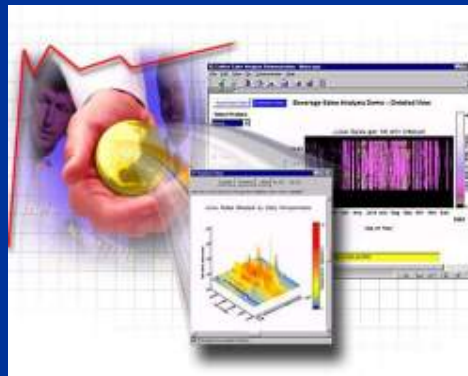


Proven Legacy Data warehouse migration team + Open-standards-based technologies, reduced total cost of ownership by 50%



Large Enterprise Warehouse

IBM sustains consistent High performance data warehousing and maintains a solid return on their investment



Legacy Warehouse,

Need Real-time Dashboards?

IBM continues to add value to legacy environments as well by adding our data warehouse environments with Alphablox in front of your older proprietary systems

Threshold Consulting

References

Threshold Consulting

“The future belongs to the well informed”

- Threshold Consulting - Threshold Consulting Services sells, markets and installs Information Management solutions, including Data Warehousing, Business Intelligence and Information Integration to the Banking and Financial Services, Investment Services, Insurance, Retail, Hospitality and Healthcare industries.
 - Founded in 1994
 - Locations in Clearwater, Florida and Atlanta, Georgia
- Key IBM Brands:
 - Software: DB2, WebSphere Business Integration
 - Hardware: pSeries, xSeries, zSeries
- Platforms Supported:
 - Linux, AIX, Microsoft Windows, NT, z/OS
- Customer references: **AT&T, AOL, Winn Dixie, Bank of America, Certegy, HCA, InvestCorp, Miami Dolphins, GE, The South Financial Group, and the State of Florida.**

Threshold Consulting

Business Benefits for our Customers:

■ Information on Demand

- Empowering executives and management with high quality information in a timely manner that allows them to analyze performance, gain perspective, take quicker actions and track results.

■ IT Strategy & Due Diligence

- Developing IT Strategies that increase the efficiency, effectiveness and overall value of IT to the business.
- Ability to quickly deliver a perceptive due diligence analysis of possible acquisitions and/or divestitures.

■ Training

- Provide high quality courses and instruction covering an array of pertinent topics in Business Intelligence and Data Warehouse technology on-site or in our state of the art Training Center located in Clearwater, Florida.

■ Resource Management

- Threshold provides significant added value to their clients by providing access to their seasoned Data Warehousing consultants' and contacts who can be available on either a full-time or contract basis to perform client specific efforts

Supporting Material

Operational Data Stores (ODS)

- Provides a fairly recent form of customer information file (CIF)
- Contents of ODS updated through the course of business applications
- Used for short-term decisions involving mission-critical applications

Metadata

Metadata are generally defined in terms of usage as technical or business metadata.

Pattern is another way to view metadata.

It is possible to differentiate between syntactic metadata, structural metadata and semantic metadata (meaning of data in a specific domain)

Metadata

- Business metadata comprise information that increases our understanding of traditional data. (Kassam 2002).
- Five levels of metadata maturity:
(1) ad hoc (2) discovered (3) managed (4) optimized (5) automated (Zhao 2005)

Major Components of a Data Warehousing Process

- Data sources
- Data Extraction
- Data loading
- Middleware tools
- Metadata
- Comprehensive database

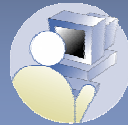
Information Warehousing

Turning Information into Insight

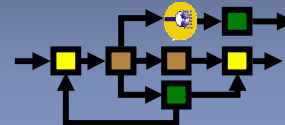
Tools & Applications



Portal Integration Ease Deployment & Usability



In-line Analysis Embedded in Process Process Driven by Analysis



Advanced Analysis

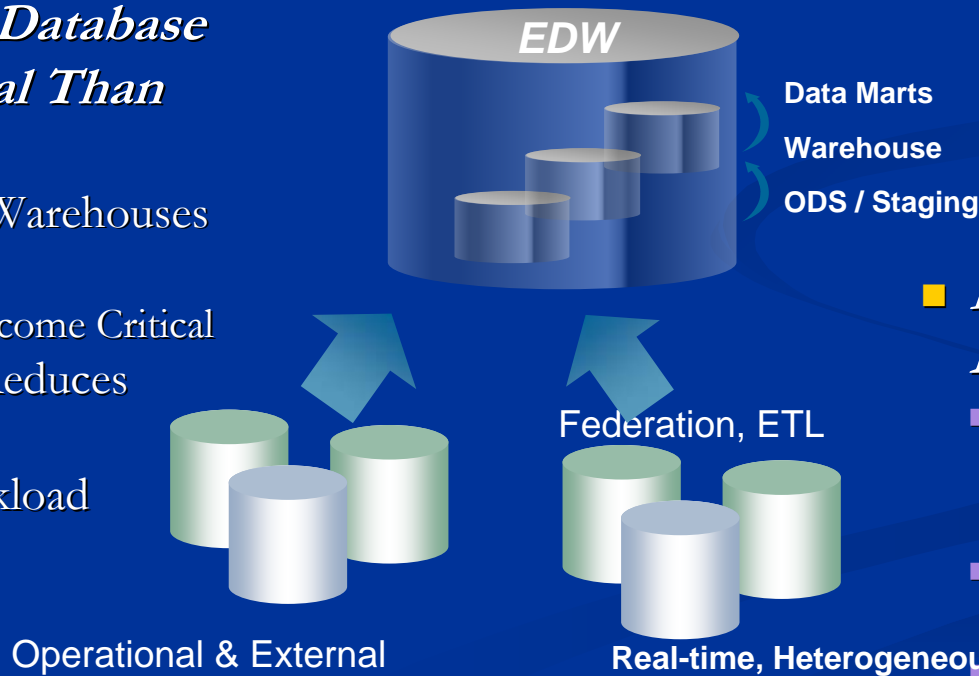
Entity Analytics
Information Mining
Predictive Modeling

+++



■ *Warehouse Database More Critical Than Ever*

- Enterprise Warehouses Emerge
 - Models become Critical
- Scalability Reduces Complexity
- Mixed Workload Support



■ *Real-time Insight is Key*

- Federation Reaches Real-time & Heterogeneous Sources
- Message Queues Stream Data
- ETL for Batch & Real-time Workloads

Commitment to Information Warehousing

IBM Intensifies Information Management Investments

- *Comprehensive Business Intelligence Portfolio*
 - *Full complement of integrated software*
 - *Industry leading price/performance servers*
 - *Comprehensive services*
 - *Implementation*
 - *Design and Deployment*
 - *Research Optimization*
- *\$1 billion investment in Information Management Oriented R&D*
 - *239 patents for information management in 2004 alone*
- *Trusted and Effective BI Solutions*
 - *9 out of the 10 largest financial institutions*
 - *8 out of the 10 largest insurance companies*

- *Lowest TCO according to numerous independent analyses*
 - *Market Magic 9/05*



Information Enables Business Innovation

Integration technologies enabling data and metadata integration

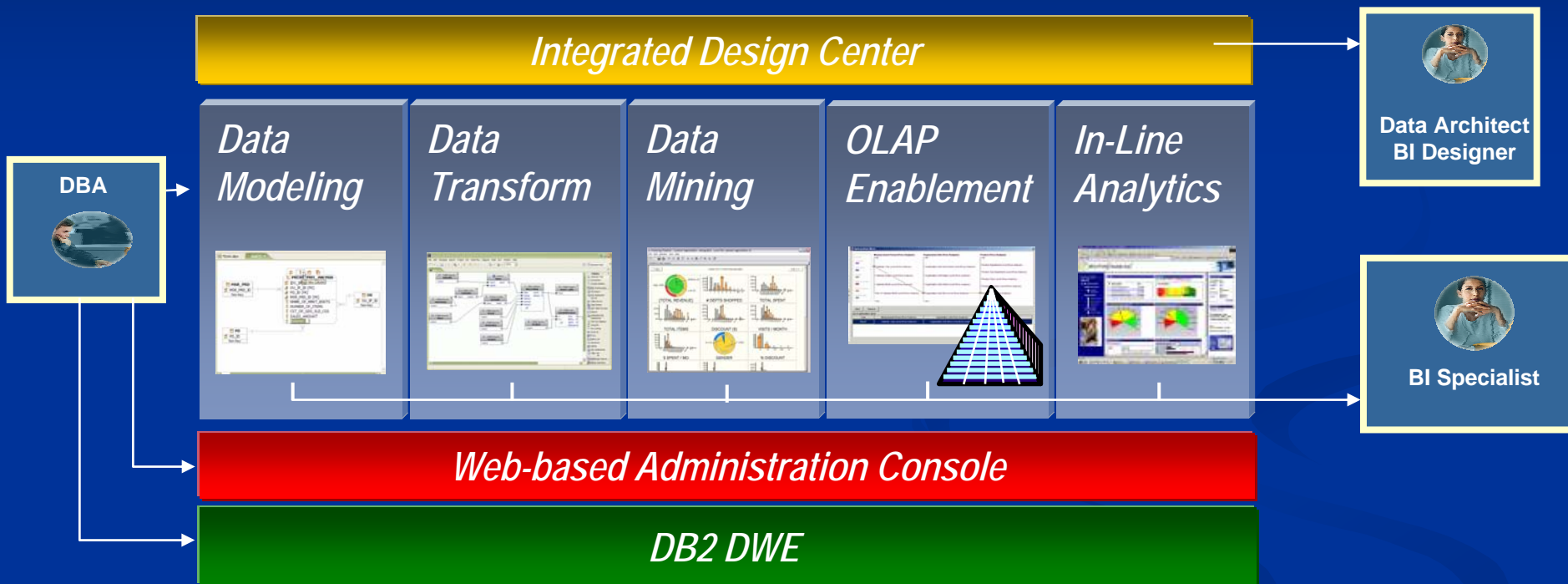
- EAI Enterprise application integration
- SOA Service-oriented architecture
- EII Enterprise information integration
- ETL Extraction, transformation, and load

The Five Styles of BI

- Enterprise reporting
- Cube analysis
- Ad hoc querying and analysis
- Statistical analysis and data mining
- Report delivery and alerting

The Integrated Data Warehouse

DB2 Data Warehouse Edition



Focus on Management Simplicity and Query Management

Summarizing DWE Key Features

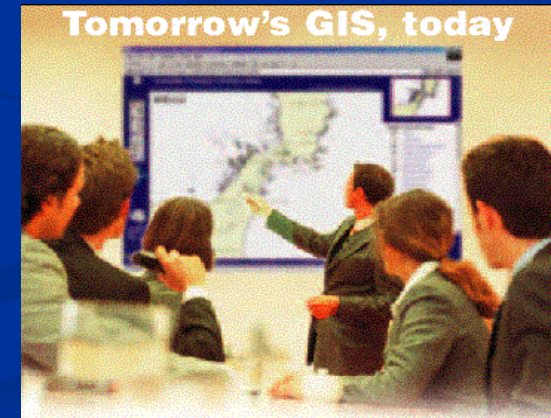
- Parallel Everything
- Simplified administration and data management
 - Data management simplified through DB2 DWE and BCU platform
 - Single system view for administration using integrated BCU platform
 - Integrated warehouse life cycle using Eclipse interface
- Performance life cycle management
 - Most flexible partitioning distribution and data organization in the industry
 - MDC provides high density, high value, low IO reads
- Application transparent data acceleration layer
 - MQTs provides transparent acceleration layer over complex schemas
 - Enables real-time mixed workload (OLTP-Like with DSS workloads)
- Predictable and Reliable scalability
 - Platform scalability through a prescribed set of HW building blocks
 - No single point of failure on BCU Platform



Smarter Technology for Application Neutral Design

Smarter Technology reduces IO, Memory, and CPU needs

- Massive parallelism of queries and utilities
- MPP Divide & Conquer (Hash Partitioning)
- More efficient IO through MDC clustering and mini-scans
- MDC More efficient bufferpool and memory utilization using MDC
- Large Block Reads
- Key Indexing for ad hoc query support
- MQTs, including index on index
- Compression



OLAP

OLAP is a special class of tools that includes BA front ends, data-access front ends, database front ends, and visual information access systems.

Characteristics of OLAP Tools

- Categorical analysis
- Exegetical analysis
- Contemplative analysis
- Formulaic analysis

MULTIDIMENSIONAL PRESENTATION

Three factors considered in this are:

- **Dimensions:** Products, salespeople, business units, geographic locations, countries and industries
- **Measures:** Money, sales volume, head count, inventory
- **Time:** Daily, weekly, monthly, quarterly, and yearly.

MULTIDIMENSIONAL DATA CUBES

- A data cube is used to represent data along some measure of interest
- Can be n-dimensional
- Each dimension represents some attribute in the database, and the cells in the data cube represent measures of interest

Data Mining

- These tools automatically extract hidden, predictive information from databases.
- Also searches for patterns in large transaction databases.

Predictive Analysis

- These tools help determine the probable future outcome for an event or the likelihood of a situation occurring.
- Also identifies relationships and patterns.

Representative Vendors' Tools For Advanced Analytics

- MicroStrategy
- Hyperion's System 9 BI+
- Cognos 8 Business Intelligence
- Microsoft
- Fair Isaac
- ILOG
- SAS
- SPSS
- Oracle

DATA VISUALIZATION

- It refers to technologies that support visualization and sometimes interpretation of data and information at several points along the data processing chain.
- It includes digital images, GIS, GUI, graphs, virtual reality, dimensional presentations, videos, and animation.

Geographic Information Systems

Is a computer-based system for capturing, storing, modeling, retrieving, checking, integrating, manipulating, analyzing, and displaying geographically referenced data by using digitized maps

Automated Decision Support (ADS)

Are rule-based systems that provide solutions to repetitive managerial problems.

ADS systems are also known as enterprise decision management (EDM) systems

ADS Applications (Davenport and Harris 2005)

- Product or service configuration
- Yield (price) optimization
- Routing or segmentation decisions
- Corporate and regulatory compliance
- Fraud detection
- Dynamic forecasting
- Operational control

BPM Methodologies

- **Align top-level strategic objectives and bottom-level initiatives**
- **Identify opportunities and problems in a timely fashion**
- **Determine priorities and allocate resources based on those priorities**
- **Change measurements when underlying processes and strategies change**
- **Delineate responsibilities, understand actual performance relative to responsibilities, and reward and recognize accomplishments**
- **Take action to improve processes and procedures when the data warrant it**
- **Plan and forecast in a more reliable and timely fashion**

Dashboards and Scorecards

(Number and Types of Data sources)

| Type | Relational Databases (%) | Mainframe (%) | Excel (%) | Packaged Applications (%) | Reports (%) | Document Systems (%) | Web Services (%) | Web Pages (%) |
|-----------|--------------------------|---------------|-----------|---------------------------|-------------|----------------------|------------------|---------------|
| Dashboard | 85 | 43 | 40 | 37 | 28 | 18 | 15 | 10 |
| Scorecard | 88 | 55 | 49 | 44 | 35 | 25 | 14 | 9 |

- Dashboard statistics on 299 respondents and Scorecards statistics on 199 respondents.
- Figures are in percentages.
- Source: Deploying dashboards and Scorecards, July 2006 (Wayne W Eckerson Business Intelligence Journal; Third Quarter 2006; 11, 3;)

Dashboards and Scorecards

(Amount of Data)

| Type | 0-50 GB | 50-100 GB | 100-250 GB | 250-500 GB | 500 GB-1 TB | 1 TB+ |
|-----------|---------|-----------|------------|------------|-------------|-------|
| Dashboard | 48 | 15 | 13 | 7 | 10 | 8 |
| Scorecard | 50 | 11 | 17 | 8 | 7 | 8 |

- Dashboard statistics on 299 respondents and Scorecards statistics on 199 respondents.
- Figures are in percentages.
- Source: Deploying dashboards and Scorecards, July 2006 (Wayne W Eckerson, Business Intelligence Journal; Third Quarter 2006; 11, 3;)

StatShots

Q Has your company derived benefits or gains from high quality data?

- Yes: 41%
- No: 10%
- Haven't studied the issue: 49%

750 respondents in 2005.

(StatShots, BI, Seattle, Second quarter 2006, vol 11 issue 2)

Which benefits has your company derived from high-quality data?

- Greater confidence in analytic systems 76%
- Less time spent reconciling data 70%
- Single version of the truth 69%
- Increased customer satisfaction 57%
- Reduced costs 56%
- Increased revenue 30%
- Other 5%

750 respondents in 2005.

Source: (StatShots, BI, Seattle, Second quarter 2006, vol 11 issue 2)

Standardizing BI Tools

Q When do you plan to standardize various BI tools?

| Type/Timeframe | Already Done | Within 2 Yrs | Three+ Years |
|---|--------------|--------------|--------------|
| Query & Reporting | 24% | 50% | 8% |
| Production Reporting | 29% | 41% | 7% |
| OLAP | 30% | 40% | 6% |
| Dashboard/Scorecard | 18% | 48% | 7% |
| Planning/modeling –*** note Rational data architect – Websphere does true process modeling | 19% | 34% | 11% |
| Data Mining | 19% | 33% | 11% |

Types of Dashboards

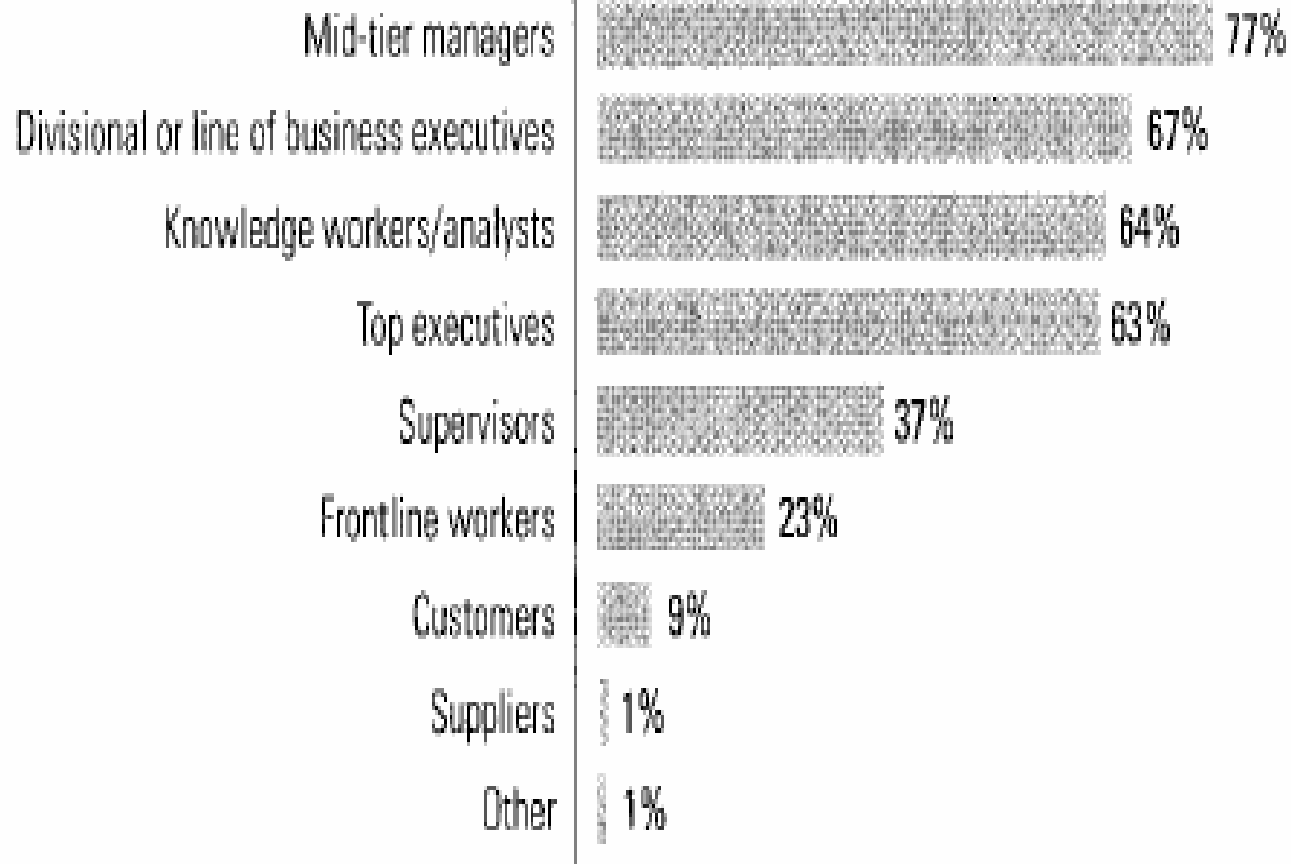
Strategic Dashboards 41%

Operational dashboards 23%

Tactical dashboards 35%

Based on 240 respondents. BI StatShots, Watson, BI Journal, Seattle,
Summer 2005, Vol 10, Iss.3

Types of Dashboard Users



Based on 240 respondents. BI StatShots, Watson, BI Journal, Seattle, Summer 2005, Vol 10, Iss.3