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**MSc Enterprise Software Systems/
MSc Communications Software**

Business Intelligence

Module Learning Outcomes:

- ▶ Examine business intelligence concepts, processes and technologies.
- ▶ Produce a plan for the application of business intelligence for decision support and process improvement in a business environment.
- ▶ Assess the concepts and recommended use of data warehouses to store data.
- ▶ Develop and demonstrate Extraction, Transformation and Loading (ETL) techniques and the data cube for analysis.
- ▶ Critically analyse data.
- ▶ Demonstrate reporting and dashboard visualization tools to visualise data to support and improve decision making.



Module Readings & Software

▶ Textbooks:

- ▶ Business Intelligence, 3rd Ed, Turban, Sharda, Delen & King.
- ▶ Business Intelligence, Rajiv Sabherwal, Irma Becerra-Fernandez, John Wiley & Sons, 2014
- ▶ <http://www.teradatauniversitynetwork.com/tun/> A great and free academic resource for BI (the available resources include cases, articles, tools including Microstrategy, datasets, exercises, etc.
 - ▶ Register asap:
 - ▶ The new student password for 2017-18 is: Analytics
- ▶ <http://www.qlik.com>_ access to software and resources.
- ▶ Labs: Excel, Qlikview, SAP Business Explorer



Additional BI Resources

- ▶ **Teradata University Network**
 - ▶ A great and free academic resource for BI (the available resources include cases, articles, tools including Microstrategy, datasets, exercises, etc.)
- ▶ **The Data Warehousing Institute - Transforming Data with Intelligence (tdwi.org)**
- ▶ **DSS Resources (dssresources.com)**
- ▶ **Business Intelligence Network (b-eye-network.com)**
- ▶ **AIIS World (aisnet.org)**
- ▶ **Gartner technology research (gartner.com)**

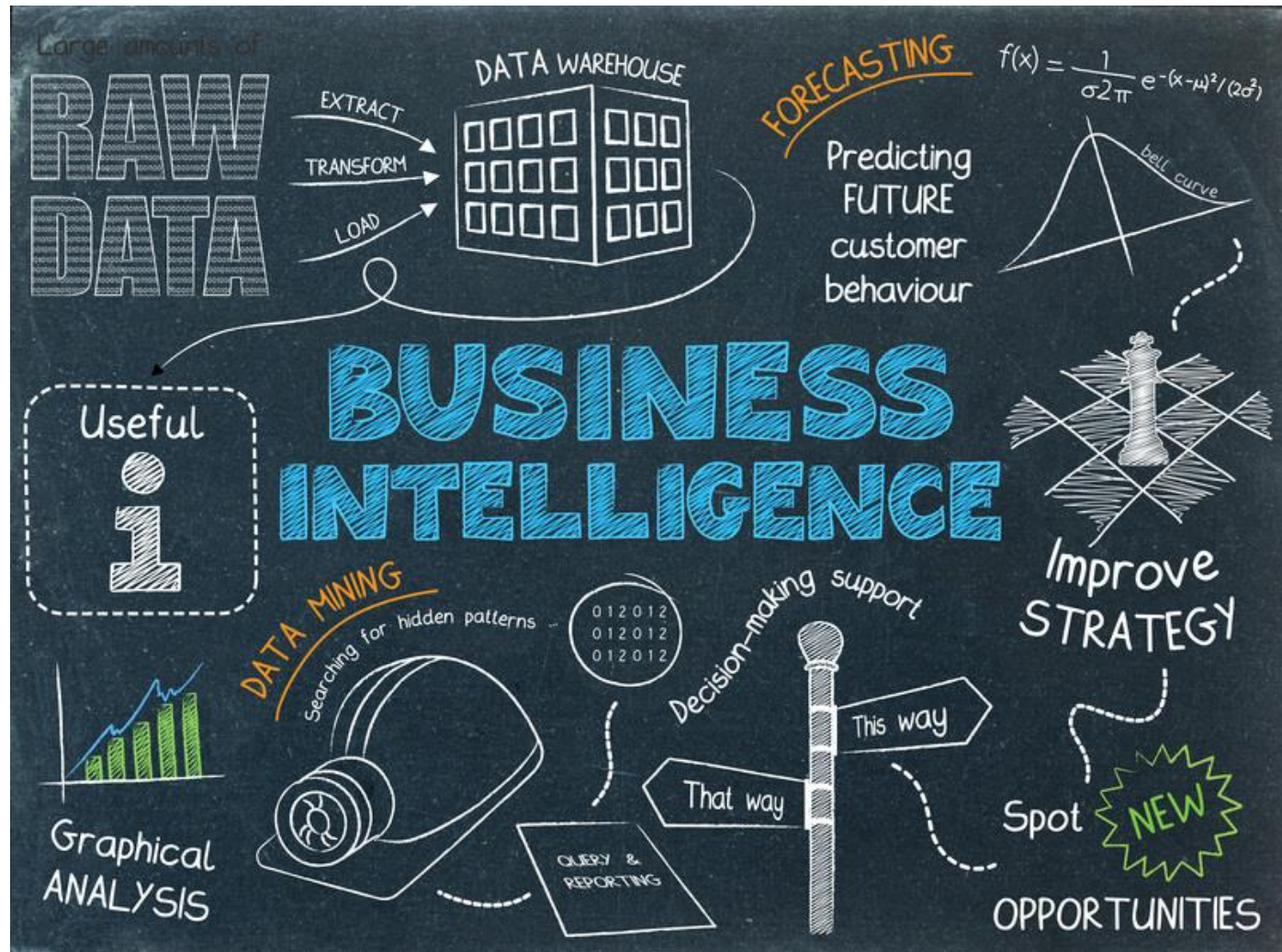


Assessment

- ▶ **Module is 50/50**
 - ▶ Written Exam 50% - December 2017
 - ▶ Practical 50% -
 - ▶ Practical project



Business Intelligence



Definition of BI

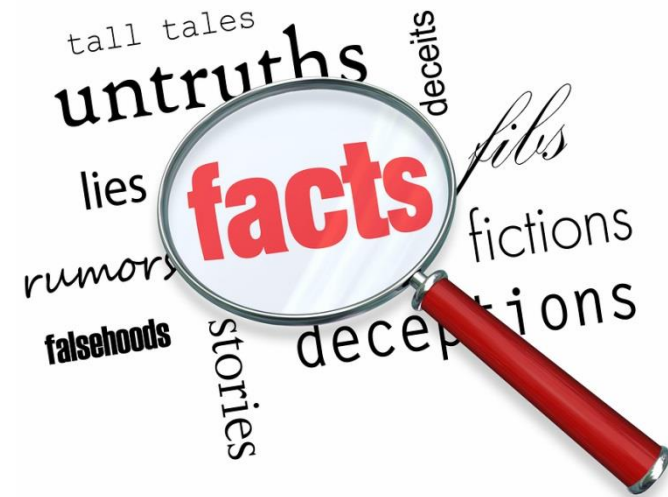
- ▶ BI is an umbrella term that combines architectures, tools, databases, analytical tools, applications, and methodologies.
- ▶ BI's major objective is to enable easy access to data (and models) to provide business managers with the ability to conduct analysis and make decisions.
- ▶ BI helps *transform* data, to information (and knowledge), to decisions and finally to action.



BI – A highly important field

▶ Benefits

- ▶ Management effectively aided
- ▶ Intellectual capital better deployed
- ▶ Business operations improved
- ▶ Customer service enhanced
- ▶ New opportunities identified



- ▶ The ability to provide accurate information when needed, including a real-time view of the corporate performance and its parts



Three Benefits of BI to Organizational Success

- ▶ **Improvement in operational performance**
 - ▶ Provide real-time information on performance
 - ▶ Organisational efficiencies
- ▶ **Improvement in customer service**
 - ▶ Improve quality of customer service provided
 - ▶ Identify problems and potential solutions quickly
 - ▶ Reduce customer concerns and improve retention
- ▶ **Identification of new opportunities**
 - ▶ Facilitate new insights through discover of unknown patterns
 - ▶ Track innovative projects more effectively



Why BI ?

- ▶ **Exploding data volumes**

BI solutions provide managers the ability to more effectively utilize these larger data volumes

- ▶ Increasingly complicated decisions

- ▶ Global competition

- ▶ Decisions from structured and unstructured data

BI solutions provide managers the ability to make decisions that incorporate all the important factors and are based on integration across the information.



Business Questions

- ▶ BI in Finance – What is the net income, expenses, gross profit, and net profit for the quarter/year?
- ▶ BI in Accounts – What is the sales amount this month and what is the outstanding pending payment?
- ▶ BI in Purchase- Who is the vendor to be contacted to purchase products?
- ▶ BI in Production – How many products are manufactured in each production unit today/weekly/monthly?
- ▶ BI in Sales – How many products have been sold in each area today/weekly/monthly?
- ▶ BI in Quality – How many products have been defective today/weekly/monthly/quarterly/yearly?
- ▶ BI in Service – Are the customers satisfied with the quality?

<http://learndatamodeling.com/blog/advantages-of-business-intelligence/>



Business Intelligence (BI)

- ▶ BI is an evolution of decision support concepts over time.
 - ▶ Meaning of EIS/DSS...
 - ▶ **Then:** Executive Information System
 - ▶ **Now:** Everybody's Information System (BI)
- ▶ BI systems are enhanced with additional visualizations, alerts, and performance measurement capabilities.
- ▶ The term BI emerged from industry apps. and evolved from data warehousing, customer relationship management, point-of-sale systems and enterprise resource planning.



BI is not data warehousing, data mining nor decision support systems

▶ Data warehouse

- ▶ A single logical repository for an organizations data

▶ Data mining

- ▶ The process of discovering hidden patterns from data stored electronically (ex. in a data warehouse)

▶ Decision support systems

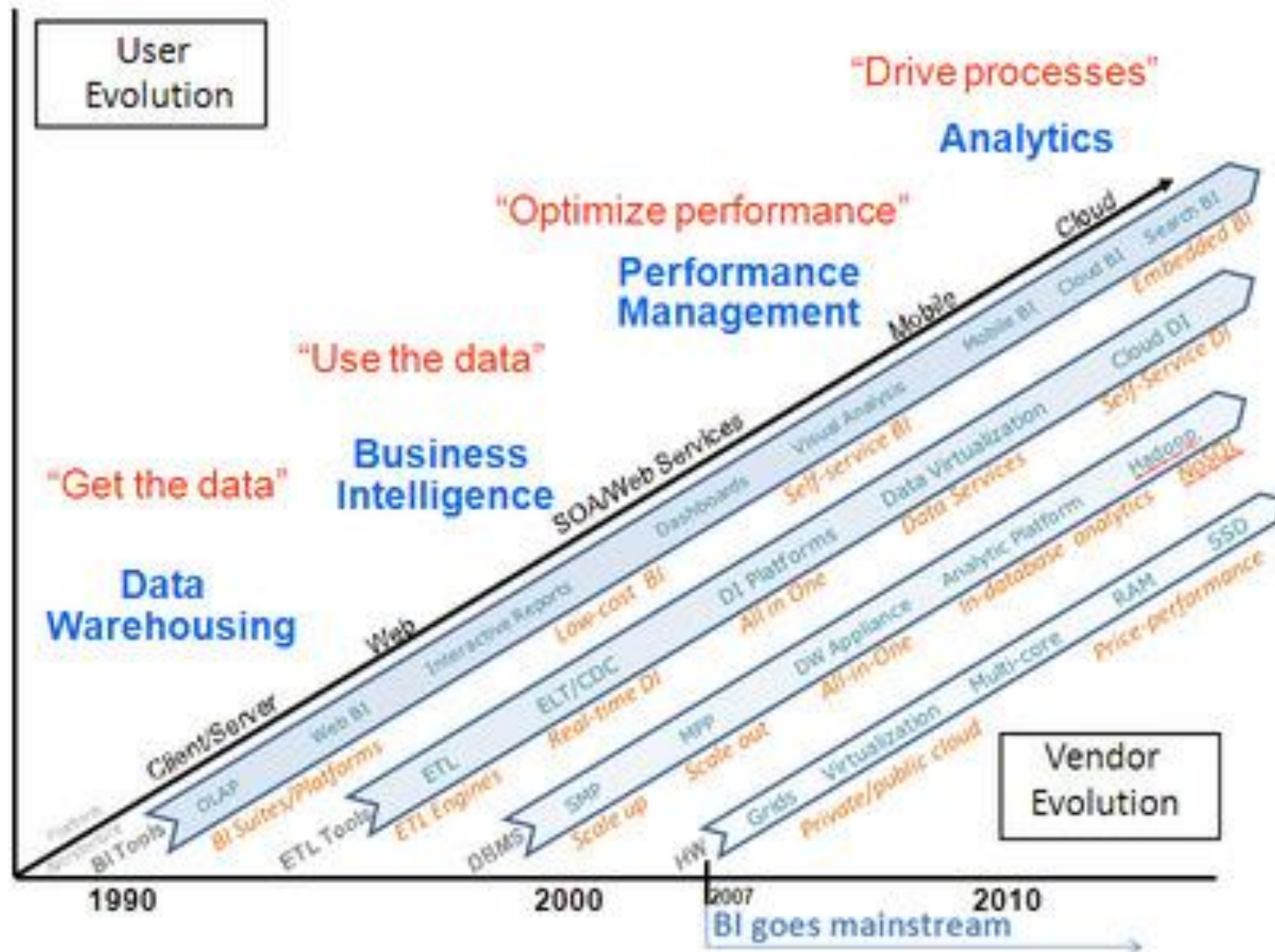
- ▶ Use data as input along with prior knowledge to create rules that guide decisions

▶ Business Intelligence

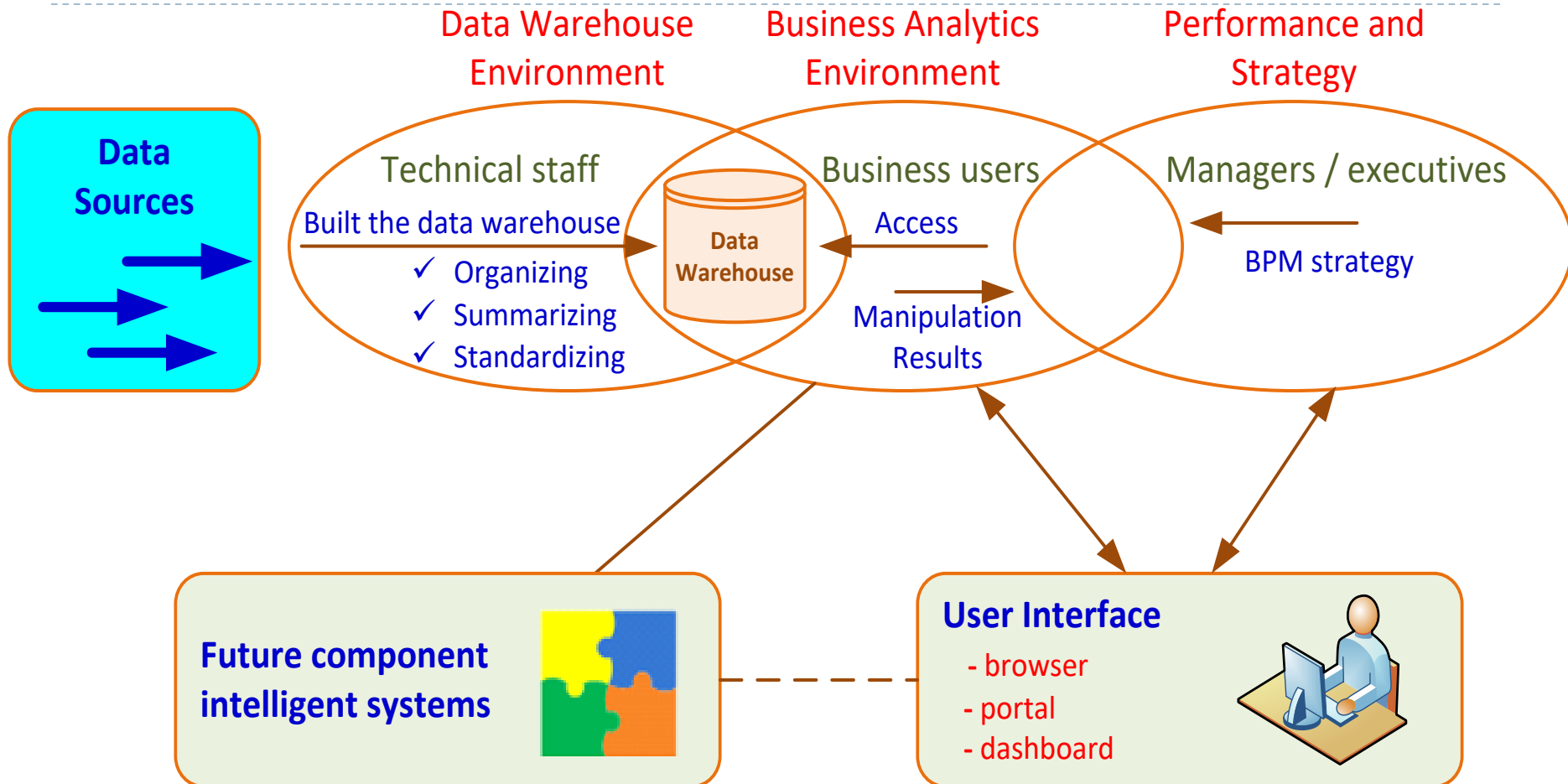
- ▶ Presents information to individuals with little technical expertise



Evolution of BI

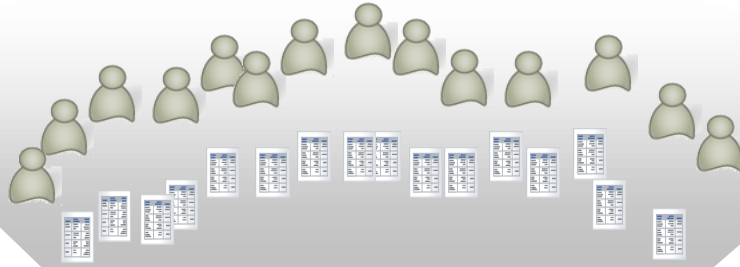


A High-Level BI Architecture



Source: Eckerson, W. Smart Companies in the 21st Century: The Secrets of Creating Successful Business Intelligent Solutions. The Data Warehousing Institute, Seattle, WA, 2003, p. 32

BI Platform is the Key Component of Business Analytic Applications



Business Intelligence Applications

Data Mining & Predictive Analysis

OLAP Analysis

Data Discovery

Dashboards & Scorecards

Enterprise Reporting

Transaction Services

Mobile Apps & Alerting

Business Intelligence Platform



MapReduce Databases



Columnar Databases



Relational Databases



& Multi-dimensional Databases



User & Departmental Data



Analytic Applications

Customer Analysis

- Customer Segmentation
- Customer Profitability
- Cross-sell / Up-sell

Supply Chain Management

- Inventory Analysis
- Fulfillment Analysis
- Distribution Cost Analysis

Financial Reporting Analysis

- P&L Reporting
- Profitability Analysis
- Financial Compliance Analysis

Product Management

- Product Performance Analysis
- Market Basket Analysis
- Category Management

Vendor Performance Analysis

- Service Level Agreement
- Chargeback Analysis
- Relative Sales Analysis

Risk Analysis

- Risk Management
- Portfolio Risk Analysis
- Fraud Detection

Operations Analysis

- Productivity Reporting
- HR Reporting
- Web Commerce Analysis

The Full Spectrum of Business Intelligence in One Seamlessly Integrated Platform

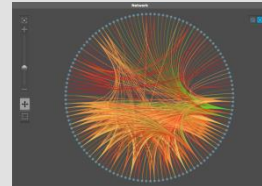
ANALYZE

Predictive Analytics

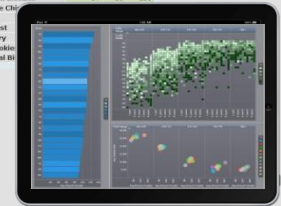
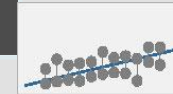
OLAP Analysis

Data Discovery

Data Warehouse



City	Product Line	Product Category	Rejected	Scrap	Output
Arlington	Bread	Country Italian Bread	16	64	155
		Crescents	12	126	128
		Dinner Rolls	2	29	48
		French Loaf	35	139	156
		Rustic French Bread	14	93	212
Arlington	Breakfast Items	Biscuit Sandwiches	22	310	524
		Cinnamon Rolls	19	109	264
		Pancakes	12	64	144
		Strudel	34	290	653
		Turkeywurst	7	72	136
Arlington	Dough	Waffles	41	411	765
		Buttermilk Biscuits	14	88	223
		Chocolate Chip			
		Pie Crust			
		Pizza Crust			



MONITOR

Enterprise Reports

Dashboards



ACT

Alerts

Transactions



Major BI Tools and Techniques

▶ Tool categories

- ▶ Data management
- ▶ Reporting, status tracking
- ▶ Visualization
- ▶ Strategy and performance management
- ▶ Business analytics
- ▶ Social networking & Web 2.0
- ▶ New/advanced tools/techniques to handle massive data sets for knowledge discovery



Four Contributions of BI

- ▶ Dissemination of user-friendly, real-time information
- ▶ Creation of new knowledge based on the past
- ▶ Responsive and anticipative decisions
 - ▶ Decision-making based more closely on all the latest information
 - ▶ Incorporate predictions regarding the future
- ▶ Improved planning for the future
 - ▶ More effective use of information
 - ▶ Use of past data for predictions about the future
 - ▶ Development of knowledge based on information about the past



Successful BI Implementation

- ▶ Implementing and deploying a BI initiative is a lengthy, expensive and risky endeavor!
- ▶ Success of a BI system is measured by its widespread usage for better decision making.
- ▶ The typical BI user community includes
 - ▶ All levels of the management hierarchy (not just the top executives, as was for EIS)
 - ▶ Provide what is needed to whom he/she needs it
- ▶ A successful BI system must be of benefit to the enterprise as a whole.



Barriers to Successful BI

- ▶ **Security and Privacy**
 - ▶ Still an important research topic in BI
 - ▶ How much security/privacy?
- ▶ **Integration of Systems and Applications**
 - ▶ BI must integrate into the existing IS
 - ▶ Often sits on top of ERP, SCM, CRM systems
 - ▶ Integration to outside (partners of the extended enterprise) via internet –
 - ▶ customers, vendors, government agencies, etc.



Web resources:

- ▶ [Top 5 Business Intelligence Myths Revealed](#)
- ▶ [Top 8 Books to Get You Off the Ground with Business Intelligence](#)
- ▶ [Gartner BI and Analytics trends 2017 explored](#)
- ▶ [9 TED Talks That Anyone Working in Business Intelligence Should Watch](#)
- ▶ [Business Intelligence Tools](#)
- ▶ [Business Intelligence Overview](#)
- ▶ [Healthcare BI platform market by 2023](#)



Business Intelligence Vendors



Future...

